Industry Competition and Firm Human Capital

Christophe Boone
Arjen van Witteloostuijn

ABSTRACT. This paper argues that objective *and* subjective human capital may have substantial impact upon organizational performance in a competitive context. Objective human capital pertains to such features as education and experience, whereas subjective human capital relates to personality characteristics. The argument is illustrated by presenting the results of two empirical studies: (1) a cross-section 1990–1991 analysis of about 50 incumbents in the Flemish furniture industry – concentrating on the impact of subjective human capital, particularly the Chief Executive Officer's (CEO's) locus-of-control personality, on financial performance; and (2) a longitudinal 1970–1992 analysis of a cohort of 100 entrants into the Dutch audit industry – focusing on the influence of objective human capital, particularly education and experience, on exit by merger and acquisition (M&A) or "diaspora". Both studies support the claim that objective and subjective human capital matters: for example, Flemish furniture firms headed by a CEO with an internal locus-of-control trait reach higher levels of financial performance, and Dutch audit firms with a high proportion of personnel with business experience are more likely to exit the industry over the years as a result of diaspora. Finally, the data of the Flemish furniture and Dutch audit industries are re-analyzed so as to compare the impact of human capital variables on small-firm performance in both industries. This re-analysis reveals that in both industries the impact of human capital variables is more pronounced in large firms compared to small businesses.

1. Introduction – organizational performance and human capital

The issue of organizational performance – in terms of organizational survival, or entry and exit, as well as financial performance, or growth and decline – attracts much attention from both economic and sociological disciplines. In economics, the contribution of industrial organization (IO) is particularly revealing; in sociology, the two-decade history of organizational ecology (OE) is illustrative. Both traditions share their interest in explaining the ups and downs in the history of industries and organizations (Boone and Van Witteloostuijn, 1995). Where IO focuses on market concentration, OE deals with population density; what is called entry and exit in IO, is known as founding and mortality in OE. This paper takes both perspectives as the points of departure while studying organizational performance, hoping that such eclecticism generates added value in the search for determinants of organizational failure and success.

In recent years, both IO and OE have enlarged their scope by introducing human capital arguments in their explanation of organizational performance. A clear example in the IO tradition is Bates (1990), whereas Preisendörfer and Voss (1990) is an illustrative study with an OE flavor. Here, the key argument is that the survival chances of startups increase with the founder's human capital. Especially the founder's education and experience are considered to be human capital features that have a substantial impact on new firm performance. Still, however, to our knowledge the number of studies testing the significance of such human capital features in explaining organizational performance is limited indeed.

Studies as Bates' (1990) and Preisendörfer and Voss' (1990) focus on *objective* – or observable – human capital features. Apart from objective human capital, however, *subjective* – or unobservable – human capital may play a role. Particularly entrepreneurial behavior research and top management studies have incorporated subjective human capital elements in the form of personality traits. For example, Miller and

Final version accepted on June 8, 1995

University of Limburg,
Faculty of Economics and Business Administration,
Department of Management Sciences and
MANOR (MAastricht Nexus of Organization Research),
P.O. Box 616,
6200 MD Maastricht,
The Netherlands

Small Business Economics 8: 347–364, 1996.

Toulouse's (1986a) findings reveal that (small) firms headed by a Chief Executive Officer (CEO) with an internal rather than external locus-of-control trait are, on average, associated with organizational success. Again, however, we are aware of only a limited number of organizational performance studies that have taken account of such subjective human capital features.

The key argument in this paper is that our understanding of the driving forces behind organizational performance can be deepened by a three-fold integration: (1) cross-fertilization of theories from *economic* and *sociological* disciplines, particularly IO and OE; (2) introduction of *objective* and *subjective* human capital features; and (3) explanation of *financial* performance and organizational *survival*. The current paper takes up this challenge by adopting, though imperfectly, such an integrative perspective. The imperfection follows from the observation that the core of this paper – two empirical studies – focuses on pieces of the puzzle only. That is, the first study is a cross-section 1990–1991 analysis of about 50 incumbents in the Flemish furniture industry – concentrating on the impact of *subjective* human capital, particularly the CEO's locus-of-control personality, on *financial* performance –, whereas the second study is a longitudinal 1970–1992 analysis of a cohort of 100 entrants into the Dutch audit industry – focusing on the influence of *objective* human capital, particularly personnel education and experience, on organizational *survival*. Moreover, the data of the Flemish furniture and Dutch audit industries are re-analyzed so as to compare the impact of human capital variables on organizational performance in both industries. This re-analysis focuses on *small*-firm performance in particular. Hopefully, the combination of all pieces illustrates the added value of an integrative approach – the puzzle – to the study of organizational success and failure.

The paper is organized as follows. Section 2 briefly reviews the literature from the angle of the integration of IO and OE. Section 3 adds to this cross-fertilization arguments from human capital theory. Section 4 introduces the samples, measures and methods. Section 5 presents the findings from the first study in the Flemish furniture industry. Section 6 describes the second study's results on the Dutch audit industry. Section 7 compares results for both industries, with an emphasis on firm size effects. Section 8 is an appraisal. Note in advance that detailed information on both industry studies is presented in Boone and De Brabander (1994) and Boone and Van Witteloostuijn (1994a), respectively.

2. Industrial organization and organizational ecology – matching theoretical modeling and empirical testing

The issue of organizational performance is central to both IO and OE. The key – dual – question here is: how is inter-organizational – and thus market – behavior shaped, and what does this imply for organizational – and thus market – performance? The number of books and papers devoted to the quest for answers to this fundamental question is sufficient to stock the Empire State Building. Therefore, of course, in the context of the current paper both research traditions can only be characterized briefly with the aim to set the scene for this paper's attempt – following the contributions of Bates (1990) and Preisendörfer and Voss (1990) referred to in the introduction – to enrich the study of organizational and market behavior by introducing human capital reasoning. Doing so, the focus is on the issue of *market structure* and *firm survival*.

Firstly, modern IO has a strong footing in game theory (Tirole, 1988). With the help of game-theoretic tools an immense number of specific mathematical models of specific market structures has been produced (Fisher, 1989). In the second half of the 1980s, this state of the art induced prominent scholars (including Tirole, 1988, pp. 3–4) to advocate a re-tipping of the balance in favor of an increased empirical research effort [again, as the "old" structure-conduct-performance tradition was largely empirical in nature (Scherer and Ross, 1990)]. This is clear from the overall purport of reviews of the *Handbook of Industrial Organization* (Schmalensee and Willig, 1989) such as those of Fisher (1991), Porter (1991) and Waterson (1992). The key point is that, by and large, modern empirical studies (Schmalensee, 1989) are only loosely coupled to the stock of frontier game-theoretic modeling. An admirable attempt to move modern IO beyond (game) *theory* is Sutton (1991).

On the basis of decade-long (game-theoretic) modeling in the area of oligopoly theory Sutton (1991) derives a number of illuminating hypotheses on the sunk cost – *market structure* nexus. The conduct element emerges through the sunk cost concept: in their quest for profitability firms may have to invest in their competitive position by sinking cost in scale, advertising or R&D. The magnitude and nature of sunk cost competition ultimately determine market structure in terms of the mere number (in the terminology of OE: density) and size distribution (in terms of IO: concentration) of firms. Basically, three market structures can emerge: concentrated, fragmented and dual. Concentrated and fragmented market structures are standard in the literature. A concentrated market is characterized by low density and high concentration, whereas the opposite is true for a fragmented structure (Panzar, 1989). The *dual* market structure so far received less attention in the literature: then, high density goes hand in hand with high concentration. A theoretical example of the analysis of dual market structures is the modeling of small-firm entry accommodation – a competitive fringe – by large-firm market leaders (Gilbert, 1989).

The issue of *firm survival* – and its mirror image: firm exit – is relatively underemphasized within IO (Van Witteloostuijn, 1995). In the 1980s, a countable number of exit models appeared in the literature – initiating contributions being Jovanovic (1982) and Ghemawat and Nalebuff (1985). By and large, exit modeling within IO focuses on the survival-enhancing impact of efficiency and size. For example, Ghemawat and Nalebuff (1985, 1990) argue that in the absence of substantial scale economies large firms facing declining demand have to decide to exit first, and Jovanovic (1982) and Jovanovic and Lach (1989) model a survival-of-the-fittest environment in which efficient firms drive their inefficient rivals from the market. Empirical IO studies on exit are scarce. On average, however, the empirical contributions reveal that small and young firms have the highest failure rates (Dunne *et al.*, 1988, 1989). Moreover, Audretsch (1994) is an example of a study revealing the negative impact of (contemporaneous) concentration on survival rates.[1]

Secondly, OE is basically a large set of empirical studies into the long-run evolution of populations of organizations (Hannan and Freeman, 1989). Contrary to IO, its theoretic basis is not strikingly sophisticated. Rather, OE studies typically jump into the empirical part of their undertaking after a brief and non-mathematical introduction of testable hypotheses. As far as *market structure* is concerned, the key hypothesis of OE is that the evolution of population density reveals a logistic pattern. That is, the number of organizations within a population (in terms of IO: market) initially grows slowly (embryonic market), then increases rapidly (growth market), and subsequently stabilizes (mature market) before dropping down (declining market). This prediction is deduced from an elementary theory of competition and legitimation (Hannan and Carroll, 1992, pp. 25–44). In the empirical arena, OE's prediction of the logistic evolution of density has survived tests in a large number of populations, varying from American labor unions (Hannan and Freeman, 1987, 1988) to Irish newspapers (Carroll and Hannan, 1989a).

An interesting parallel with IO's dual market structure argument is the *resource partitioning* model within OE (Carroll, 1985). The key argument in this model is that the resource space within a population can be divided into segments that are separated in the sense that within-segment competition dominates over between-segment rivalry. Here, the elaboration of Baum and Mezias (1992) relates to IO's dual market structure notion. That is, Baum and Mezias (1992) argue that within a population small firms compete against small rivals, and large firms face competition from large competitors. The resource partitioning model has been confirmed for, e.g., the U.S. newspaper (Carroll, 1985) and brewery (Hannan and Carroll, 1992) industries. Boeker (1991) is an example of a study that successfully links the OE argument on resource partitioning with the IO-related concept of strategic groups (Caves and Porter, 1977) on the basis of U.S. brewery data.

Hannan and Carroll (1992) nicely summarize the robust empirical findings within OE relating to the survival-enhancing features of organizations that have to operate in a selective environment. The three basic organizational features relating to the issue of *firm survival* that emerge in OE studies are age, change and size. Moreover, environmental density, both at the date of founding and

over time, is assumed to determine failure rates. Basically, the theoretical argument and empirical evidence suggest, by and large, that the chances of a firm's survival increase with organizational age and size, and decrease with environmental density (contemporaneous and at founding) and organizational change. The negative impact of density at founding is called the delayed-density effect, which is due to the imprinted downside of competition for scarce resources in an overcrowded population (Carroll and Hannan, 1989b). That is, unfavorable circumstances at founding have a longlasting (negative) impact on the entrants' survival chances for (at least) two reasons: first, organizations entering an overcrowded population are forced into unattractive niches; and, second, in high density environments entrants are only able to obtain limited and/or inferior resources.

This paper explores the IO-OE interface by focusing on three hypotheses related to the issues of market structure and organizational performance. Hypothesis 1a implies a replication of many OE studies on the density-delay argument. Hypothesis 1b focuses on the density-delay effect on *small*-firm survival. Hypothesis 1c transfers OE's delay argument to IO's notion of concentration, but pertaining to *large*-firm survival. The combined Hypothesis 1b-c goes for an indirect test of the dual market structure (IO) or resource partitioning (OE) theories in the Dutch audit industry, both predicting that direct competition is size-dependent. The descriptive statistics of the Dutch audit industry (Table V below) clearly suggest a dual market structure: for instance, in 1975 the four largest audit firms controlled 50.6% of a market with a total of 271 audit firms (Boone and Van Witteloostuijn, 1995). Note that the industry-specific application of the hypotheses is simply the result of limited data availability. Therefore, for each (sub)hypothesis the relevant industry is indicated between brackets.

H1 Competition at founding: (a) density at founding decreases survival chances of entrants, (b) density at founding decreases survival chances for small but not for large entrants, and (c) concentration at founding decreases survival chances for large but not for small entrants (Dutch audit industry).

Hypothesis 2 implies a straightforward application of the IO and OE argument that a firm's survival chances are facilitated by favorable demand (IO) or carrying capacity (OE) conditions at the date of founding.

H2 Demand at founding: Firms founded in growth markets with high demand have higher survival chances (Dutch audit industry).

Finally, Hypothesis 3 concentrates on the effect of size on organizational performance. As far as the size-profitability nexus is concerned, the argument is that "it depends". For example, within IO oligopolist collusion and scale economies point to a positive correlation while Bertrand competition and niche advantages imply a negative or zero effect. Therefore, Hypothesis 3a is a null benchmark only. On the size-survival issue, the findings in the literature are largely congruent. Both IO and OE studies have revealed that firm survival is positively correlated with firm (startup and current) size. For example, Audretsch (1994) reports a negative impact of startup size on the likelihood of plant exit in a sample of about 8000 1976 entrants in U.S. industries. This is Hypothesis 3b.

H3 Current size and size at founding: Larger firms are associated with (a) higher financial performance (Flemish furniture industry) and (b) larger entrants have higher survival chances (Dutch audit industry).

By way of summary, the purport of the above argument is that modern IO generated much theory without extensive empirical testing, whereas OE has produced much empirical work without sophisticated theory grounding. A cross-fertilization between both traditions – in terms of results as well as attitudes – is likely to induce added value (Boone and Van Witteloostuijn, 1995). Table I summarizes the key IO-OE differences. Note that Table I's characterization is not absolute, but rather indicates differences in emphasis.

Two differences in emphasis need additional explanation.[2] First, a key issue in the debate on market evolution is what dominates in practice: environmental selection or organizational adaptation. Here, OE takes an extreme position by arguing that organizations are – and must be so as to survive – (relatively) inert. This view is in contrast with mainstream IO, which focuses on organizational adaptation (and thus organizational flexibility) through the examination of profit-

TABLE I
IO and OE compared

Element	Emphasis	
	Industrial organization	Organizational ecology
Discipline	Economics	Sociology
Orientation	Theoretical	Empirical
Data	Cross-section	Longitudinal
Firm	Flexibility	Inertia
Market	Concentration	Density
Performance	Profitability	Survival

maximizing strategy choices (Boone and Van Witteloostuijn, 1994b). Second, the very assumption of profit-maximizing behavior that dominates IO research implies a focus on profitability as the evaluation benchmark while assessing organizational performance. OE, to the contrary, argues that mere survival is the ultimate test of organizational performance (Carroll and Harrison, 1993).[3]

As far as the IO-OE interface is concerned, the current paper focuses on the issues of dual market structures, demand conditions and organizational size dependencies. To be honest, the current paper's contribution to *theory* development is modest. That is, on the theoretical side the argument follows the lead of such scholars as Bates (1990) and Preisendörfer and Voss (1990) by introducing human capital variables into a (non-mathematical) framework that aims at explaining organizational performance. This is the message of the next section.

3. Human capital and organizational performance – objective and subjective features of CEOs and personnel

The proposition that human capital matters for organizational performance is well-known in literatures on entrepreneurial behavior and top management functioning. Table II classifies the literature as to their focus on two elements: (1) objective and/or subjective human capital; and (2) financial performance and/or organizational survival. Moreover, Table II contains – if known – one illustrative example of a study per combination of elements.

The number of studies which include *objective* human capital variables in their search for explanations of organizational performance is increasing, the contributions of Bates (1990) and Preisendörfer and Voss (1990) referred to in the introduction being clear examples. Section 6 reports the results of Boone and Van Witteloostuijn (1994a), concentrating on explaining organizational survival with the help of objective human capital variables. The contribution of Eisenhardt and Schoonhoven (1990) is an example of a study directed at explaining financial performance after including objective human capital variables.[4] They argue that ventures newly established in (i) growth markets with (ii) low concentration and founded by (iii) a large team of entrepreneurs with (iv) high variation in industry experience reveal higher growth rates. On the basis of the analysis of a sample of 92 U.S. semiconductor ventures newly established in the 1978–1985 period they report supportive evidence for predictions (i), (iii) and (iv), but not for (ii).

TABLE II
(Non)integrative studies

Performance	Human Capital		
	Objective	Subjective	Both
Financial performance	Eisenhardt and Schoonhoven (1990): 92 U.S. semiconductor ventures	Boone and De Brabander (1994): about 50 Flemish furniture firms	Govindarajan (1989): industry cross-section of 121 SBUs
Organizational survival	Boone and Van Witteloostuijn (1994a): 100 audit firm startups	Brockhaus (1980): 31 U.S. founders of new businesses	?
Both	?	?	?

In the field of top management studies, a strand of literature focuses on the role of *subjective* human capital – in the form of personality traits of managers (particularly CEOs) – on financial performance. Section 5 below summarizes the key findings of Boone and De Brabander (1994), focusing on the explanatory power of the CEO's locus-of-control trait. Studies explaining organizational survival chances with reference to subjective human capital features are scarce. An intuitive reason for this observation is that a *longitudinal* study of the founder personality – firm survival nexus is difficult to accomplish as the personality traits of the founders of failed firms are difficult to trace in an *ex post* analysis.[5] The explorative study of Brockhaus (1980) is a rare example of this type of research. Brockhaus (1980) collected (questionnaire) data on about 30 founders of new businesses in the U.S. at two points in time: shortly after they had entered the market, and a follow-up three years later. His main finding is that successful entrepreneurs reveal a more internal locus-of-control personality.

Studies that focus on *both* objective and subjective human capital and/or financial performance and organizational survival are, as far as we know, virtually absent (cf. note 4). Govindarajan (1989) is a rare example of an empirical study that seeks to explain financial performance with objective and subjective human capital variables.[6] His analysis of the performance of 121 SBUs of large U.S. firms reveals that the SBU's general manager's functional background, general management experience, industry familiarity, locus-of-control trait and problem-solving style are important determinants of the SBUs' effectiveness.

The current paper adopts five hypotheses related to the features of CEOs and personnel. First, following agency theory arguments, a number of studies incorporated an ownership structure variable in their effort to explain organizational performance. For example, Oswald and Jahera's (1991) findings suggest that firms headed by managers with own-company shares show significantly higher performance, and Audretsch (1994) reports that independent entrants have higher survival rates than newly established branch plants and subsidiaries. This argument is reflected in Hypothesis 4.

H4 Current ownership and ownership at founding: (a) firms currently headed by (family of) the founder generate higher financial performance (Flemish furniture industry) and (b) firms with a higher proportion of owner-managers at founding have higher survival chances (Dutch audit industry).

Second and third, studies as those of Bates (1990), Preisendörfer and Voss (1990) and Brüderl *et al.* (1992) reveal that organizational success is facilitated by *general* human capital – specifically in the form of increased schooling of the founders – and *specific* human capital – particularly the founders' previous (management) experience inside or outside the current firm and/or industry. Hypothesis 5 focuses on general human capital (education), and Hypothesis 6 on specific human capital (experience).

H5 Education of current CEO and education of personnel at founding: (a) firms currently headed by a highly educated CEO are associated with higher financial performance (Flemish furniture industry) and (b) firms with highly educated personnel at founding have higher survival chances (Dutch audit industry).

H6 Business experience of current CEO and business experience of personnel at founding: (a) firms currently headed by a CEO with much business experience generate higher financial performance (Flemish furniture industry) and (b) firms with highly experienced personnel (in business) at founding reveal higher survival chances (Dutch audit industry).

Fourth, as said above, a substantial number of top management studies emphasizes the favorable influence of an internal locus-of-control personality, particularly the CEO's, on organizational performance. The argument here is that CEOs believing that they can control their fate by their own effort and skill, implying internality, are more effective managers (Thomas *et al.*, 1991). This line of reasoning is formulated in Hypothesis 7.

H7 Locus-of-control of current CEO: Firms currently headed by a CEO with an internal locus-of-control personality are associated with higher financial performance (Flemish furniture industry).

Fifth and finally, the impact of the entrepreneur's human capital features may be more pronounced in smaller firms, since the communication capacity and span of control of managers are limited. This may explain why this type of research is particularly popular in the context of the study of small business performance. Hypothesis 8 captures this argument.

H8 Size effect. The impact of human capital features of the CEO or personnel (H4–7) is stronger in smaller firms (Flemish furniture and Dutch audit industries).

Of course, all hypotheses are *ceteris paribus*. That is, it may well be that important interaction effects prevail in a number of cases. For example, perhaps highly educated and experienced entrepreneurs are better able to handle a large number of subordinates or to trace market opportunities that permit large-scale entry. The current paper, however, gives only limited attention to such interaction effects, given the small samples at hand.

The findings relating to Hypotheses 3a and 7 on the Flemish furniture industry are presented in Section 5, and the results for the Hypotheses 1a-b-c, 2, 3b, 4b, 5b and 6b on the Dutch audit industry are reported in Section 6. Finally, Hypotheses 4a, 5a, 6a and 8 are tested on the basis of the re-analysis of the data in Section 7. In advance, two remarks are worth making. First, Hypotheses 1–3 have their origin in IO and/or OE (Section 2), Hypothesis 4 originates from agency theory, Hypotheses 5–7 are based upon complementary human capital arguments (Section 3), and Hypothesis 8 is related to the small business economics literature (Section 7). Second, the Flemish furniture industry research as well as the Dutch audit industry study focuses on specific topics next to the issues reflected in Hypotheses 1–8. Specifically, the Flemish furniture industry research concentrates on the role of strategies of *cost leadership* versus *product differentiation*, whereas the study on the Dutch audit industry differentiates the results for exit by *merger and acquisition* (M&A) or *diaspora*. Table III summarizes the hypotheses.

4. Samples, measures and methods

The study of the Flemish furniture industry is based upon a *sample* of the largest (with total assets above $1.2 million) Flemish furniture firms in 1990 (Boone, 1992). CEOs of 81 firms were interviewed in 1990–1991, and 64 CEOs returned one or two of the administered questionnaires. Next to the interviews and questionnaires, financial reports were consulted. The variables are listed in Table IV, including their measures and descriptive statistics.

The cross-section data were analyzed with OLS and hierarchical regression analysis. Details on samples, measures and methods are reported in Boone and De Brabander (1994). The major findings are presented in Section 5.

The study of the Dutch audit industry pertains to the nearly *complete* set of 100 new firms that entered the market in the 1970–1975 period (Maijoor *et al.*, 1995). The data were collected from the membership lists of the professional body of Dutch registered auditors (RAs), "Nederlands

TABLE III
Hypotheses

Hypothesis	Predicted effect	
	Flemish furniture industry	Dutch audit industry
1a: Density at founding – firm survival	Not tested	Negative
1b: Density at founding – small-firm survival	Not tested	Negative
1c: Concentration at founding – large-firm survival	Not tested	Negative
2: Demand at founding – organizational survival	Not tested	Positive
3a: Current size – financial performance	Positive	Not tested
3b: Size at founding – organizational survival	Not tested	Positive
4a: Current (family of) founder-owner – financial performance	Positive	Not tested
4b: Proportion of owner-managers at founding – organizational survival	Not tested	Positive
5a: Education of current CEO – financial performance	Positive	Not tested
5b: Education of personnel at founding – organizational survival	Not tested	Positive
6a: Business experience of current CEO – financial performance	Positive	Not tested
6b: Experience of personnel at founding – organizational survival	Not tested	Positive
7: Internal locus-of-control current CEO – financial performance	Positive	Not tested
8: Human capital features – small-firm performance	Positive	Positive

TABLE IV
Flemish furniture industry study: measures and statistics

Variables	Measures	Statistics*	
Size	Number of employees	Mean	= 76.8
		SD	= 76.1
		Maximum	= 417
		Minimum	= 10
		N	= 62
Locus-of-control	The Rotter questionnaire with 37 forced-choice items (including 14 filler items) with low scores indicating externality and high scores implying internality	Mean	= 14.7
		SD	= 3.4
		Maximum	= 21
		Minimum	= 6
		N	= 62
Cost leadership	A combination of three proxies – distribution intensity, Computer Numerical Control investment and price charged relative to competitors	Mean	= 0
		SD	= 1
		Maximum	= 3.6
		Minimum	= −1.3
		N	= 41
Product differentiation	A combination of three proxies – advertising intensity, product design emphasis and salaried salesmen intensity	Mean	= 0
		SD	= 1
		Maximum	= 2.9
		Minimum	= −1.2
		N	= 41
Performance	A combination of three proxies – cash flow on assets, return on assets and price-cost margin, all averaged over two-year periods	Mean	= 0
		SD	= 1
		Maximum	= 2.5
		Minimum	= −2.7
		N	= 59

* SD = standard deviation and N = number of observations.

Instituut voor Register Accountants" (NIvRA). All RAs are obliged by law to be member of the NIvRA (being the monopolist body of RAs since 1967). The list of variables, measures and descriptive statistics is reported in Table V.

The longitudinal data were analyzed with univariate mean comparisons and logistic regression analyses. Details on the samples, measures and methods are presented in Boone and Van Witteloostuijn (1994a). The main results are discussed in Section 6.

Both industries are, in many ways, radically different. In black-and-white shades the following elements characterize the main differences. The Flemish furniture industry, on the one hand, is fragmented without large-firm market leaders, has a century-long tradition of family business, is associated with substantial export and import flows, is supplier of retail trade firms and produces a physical craft product requiring low to moderately educated labor. The Dutch audit industry, on the other hand, is highly concentrated with a dominant top-five of market leaders, is a non-family business with a primarily post-war history, is a national market without international trade, supplies directly to end consumers and produces an intellectual professional service requiring highly educated personnel. Section 7 includes a comparative analysis – as far as possible – of both industries so as to unravel, though tentatively only, industry and size effects.

5. The flemish furniture industry – subjective human capital and financial performance

The original purpose of the cross-section study in the Flemish furniture industry was to examine the relative importance of a specific personality trait of CEOs – locus-of-control – in determining financial performance. For detailed results and inter-

Table V
Dutch audit industry study: measures and statistics

Variables	Measures	Statistics	
Density	The total number of audit firms in the industry	1970	: 306 firms
		1971	: 284 firms
		1972	: 270 firms
		1973	: 267 firms
		1974	: 265 firms
		1975	: 271 firms
Concentration	C_4 in the industry	1970	: 36.4%
		1971	: 37.3%
		1972	: 49.0%
		1973	: 50.8%
		1974	: 50.4%
		1975	: 50.6%
Size	Number of registered auditors, being either employee or partner of the firm	Mean	= 3.2
		SD	= 5.55
		Maximum	= 41
		Minimum	= 1
		N	= 100
Ownership	Proportion of auditors who are partner of the firm	Mean	= 0.95
		SD	= 0.14
		Maximum	= 1
		Minimum	= 0.33
		N	= 100
Schooling intensity	Proportion of employee and partner auditors of the firm who have an academic certificate	Mean	= 0.31
		SD	= 0.40
		Maximum	= 1
		Minimum	= 0
		N	= 100
Business experience	Proportion of employee and partner auditors of the firm who have worked in (an) other organization(s) (audit or otherwise)	Mean	= 0.70
		SD	= 0.44
		Maximum	= 1
		Minimum	= 0
		N	= 100
Demand	Period 1970–1973 without demand-stimulating legislation (1), and period 1974–1975 with such legislation (0)	1970–1973	: 61 entrants
		1974–1975	: 39 entrants
Destination	Status in 1992 – survivor, M&A, diaspora or otherwise	Survivor	: 42 firms
		M&A	: 27 firms
		Diaspora	: 9 firms
		Otherwise	: 22 firms

pretations, we refer to Boone and De Brabander (1994). Here, we focus on the influence of organizational size and CEO's locus-of-control. As far as the impact of organizational size is concerned, H3a is the benchmark. In the literature on top management studies, the argument is that internal CEOs reveal more effective strategic leadership and so generate higher financial performance (Boone and De Brabander, 1993). This may be due to the fact that internal CEOs are better formulators (Miller and Toulouse, 1986a,b) and/or implementors (Govindarajan, 1989) of strategic choices. Either way, financial performance is expected to correlate positively with the CEO's internality. This is H7. The OLS regression estimates are reported in Table VI.[7]

First, as far as the impact of organizational size is concerned, the findings are only marginally

TABLE VI
Subjective human capital and financial performance in Flemish furniture firms: the effect of the CEO locus-of-control trait

Variables	Regression coefficient[a]	Partial correlation
Intercept	−1.373** (0.581)	–
Size	−0.003* (0.002)	−0.25*
Locus-of-control	0.107*** (0.038)	0.36***
F-value	5.388***	
R-square	0.172	
Sample size	55	

[a] Unstandardized regression coefficient with * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$, and standard error in parenthesis.

significant ($p < 0.10$). However, the estimated sign opposes the prediction of H3a (with a partial correlation coefficient of −0.25): that is, smaller firms seem to generate higher levels of financial performance than their larger counterparts. The negative impact of size may be explained by the two-fold observation that (i) economies of scale in production are absent, as furniture production is largely based on craftmenship [cf. Audretsch and Mahmood (1994) on the intermediating role of scale economies], and (ii) wages are higher in larger firms, due to Belgian institutional arrangements and bargaining procedures.

Second, H7 is clearly confirmed. Internality is positively and significantly correlated with financial performance (with a partial correlation coefficient of 0.36 and $p < 0.01$). To control for the possible intermediating effect of (the formulation and/or implementation of) strategic choices, the furniture firms in the sample are characterized as pursuing a strategy of either cost leadership or product differentiation (Porter, 1980). Again, the effect of organizational size is estimated (H3a). The results of a hierarchical regression analysis are depicted in Table VII.[8]

The effect of organizational size is now statistically insignificant. The finding that CEO internality facilitates financial performance survives the introduction of the strategy variables. With cost leadership and product differentiation strategies held constant, internal CEOs reach higher levels of financial performance.[9] So, in our sample of Flemish furniture firms the positive influence of a particular manifestation of subjective human capital – the CEO's locus-of-control personality trait – on financial performance is statistically significant.

TABLE VII
Subjective human capital and financial performance in Flemish furniture firms: the intermediating role of competitive strategy[a]

	Regression 1		Regression 2	
	Regression coefficient[b]	Partial correlation	Regression coefficient[b]	Partial correlation
Set 1				
Intercept	−1.550** (0.731)	–	−1.983*** (0.707)	–
Size	−0.001 (0.002)	−0.12	−0.002 (0.002)	−0.20
Locus-of-control	0.109** (0.047)	0.36**	0.143*** (0.047)	0.45***
Product differentiation			−0.342** (0.158)	−0.34**
F-value	2.705*		3.561**	
R-square	0.131		0.234	
Set 2				
Intercept	−1.550** (0.731)	–	−1.453** (0.633)	–
Size	−0.001 (0.002)	−0.12	−0.002 (0.002)	−0.15
Locus-of-control	0.109** (0.047)	0.36**	0.102** (0.042)	0.38**
Cost leadership			0.443*** (0.135)	0.48***
F-value	2.705*		5.881***	
R-square	0.131		0.34	

[a] N = 39.
[b] Unstandardized regression coefficient with * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$, and standard error in parenthesis.

6. The Dutch audit industry – objective human capital and organizational survival

The Dutch audit industry analyses were designed as an exploratory pilot study into the survival chances of entering firms. For this purpose, the complete set of firms that entered into the industry in the 1970–1975 period were selected from a data base covering the 1880–1990 era (Buijink *et al.*, 1995). The key issue in this study was to examine whether differently characterized entrants – in terms of IO/OE and human capital features at the date of founding – are associated with specific destinations. Detailed information on the study is reported in Boone and Van Witteloostuijn (1994a). As far as entry characteristics are concerned, we focused on the overall impact of density (H1a), size (H3b), ownership (H4b), education (H5b), business experience (H6b) and carrying capacity (H2) at the date of founding. Moreover, the interaction effect of competition at founding and organizational size (reflecting the dual market structure argument) is captured by H1b,c. Additionally, in 1992 three destinations were distinguished: (i) survival; (ii) M&A; and (iii) diaspora.[10] An audit firm A is said to merge with (or to be acquired by) a firm B if the majority of firm A's personnel continues his or her career as partner (or employee) within a new firm C (or within the acquiring firm B). Diaspora implies that the personnel of firm A moves into various directions: for example, from a firm A with seven auditors two start a new firm, three continue their career as an internal auditor within large enterprises, and two become partner of a larger incumbent audit firm B.[11] Given the limited sample size, Table VIII reports the results of a non-parametric comparison of means (Kruskal-Wallis ANOVA one-tailed).[12]

The test of two hypotheses generates statistically significant results. First, if M&A and diaspora are interpreted as exit of independent legal identities, then H3b is clearly falsified: smaller entrants (with mean 1.74 for surviving firms) have higher survival chances than their larger counterparts (with mean 4.41 for M&A and 9.11 for diaspora). Second, if M&A firms are assumed to survive as a group of united auditors, H4b receives support: the proportion of owners is considerably higher in surviving (with mean 0.98) and M&A (with mean 0.95) firms compared to their diaspora rivals (with mean 0.79).

Three pairwise comparisons of means reveal an additional number of statistically significant differences (applying Mann-Whitney one-tailed tests). First, the size difference stands the test of all three pairwise comparisons, which confirms the above falsification of H3b. Second, M&A firms embody more human capital – that is, higher educated personnel – at the founding date (with mean 0.42) than their surviving rivals (with mean 0.31). Third, at the date of founding the personnel of diaspora firms has more business experience (with mean 0.98) than their M&A and surviving counterparts (with means 0.77 and 0.64, respectively). The latter two findings oppose H5b and H6b. That is, firms with highly educated personnel at founding have higher mortality rates through M&A and firms with highly experienced personnel at founding reveal a higher likelihood of exit by diaspora. An explanation of this two-fold result may be that highly educated and/or highly experienced auditors have more opportunities to

TABLE VIII
Objective human capital and organizational survival in Dutch audit firms: the impact of education and experience[a]

Variables	Surviving firms (N = 42)	M&A firms (N = 27)	Diaspora firms (N = 9)	Kruskal-Wallis ANOVA[b]
Density	278.98 (16.27)	275.74 (13.94)	280.00 (19.58)	0.819
Size	1.74 (1.68)	4.41 (5.41)	9.11 (12.44)	**0.000**
Ownership	0.98 (0.08)	0.95 (0.15)	0.79 (0.27)	**0.007**
Education	0.31 (0.43)	0.42 (0.38)	0.34 (0.37)	0.313
Experience	0.64 (0.46)	0.77 (0.40)	0.98 (0.07)	0.153
Demand	0.55 (0.50)	0.59 (0.50)	0.67 (0.50)	0.792

[a] Average values are reported with standard deviation in parenthesis.
[b] One-tailed *p*-value with statistically significant values printed in bold.

move up the career ladder by joining larger audit firms or outside enterprises than their lower educated and/or less experienced colleagues. That is, auditors with less human capital – in terms of education and/or experience – are "forced" to remain self-employed in small audit firms in the face of their limited career opportunities in the outside world. Moreover, (larger) audit firms with highly educated (and at least moderately experienced) personnel are probably more attractive takeover candidates.

Remarks on the explanatory power of three remaining variables – concentration, density and demand at founding (H1 and H2), all three related to IO and OE – may complete the discussion of the results. For one, the insignificance of the period variable (founded between 1970–1973) implies that H2, on the favorable impact of higher demand, is not supported: the observation whether firms have entered the market in times of (relatively) low (1970–1973) or high (1974–1975) demand fails to contribute to the explanation of their survival chances. This is in accordance with the (confirmed) hypothesis of Bradburd and Caves (1982) and Audretsch (1994) that industry growth does not affect industry profitability (Bradburd and Caves, 1982) and establishment exit (Audretsch, 1994) in the long run. As far as the density-delay argument is concerned, for the complete sample the result does not reach a statistically significant level. Hence, H1a is not supported.

Finally, the results reported in Table VIII cannot be applied to test the dual market argument reflected in H1b,c. For this purpose, Table IX depicts the impact of concentration and density at founding on the survival chances of large (more than one auditor) and small (one auditor) entrants for the subsample of surviving and M&A firms.

TABLE IX
A dual market structure in the Dutch audit industry: concentration, density and size-dependent competition[a]

Independent variables	Small firms[b] (N = 43)	Large firms[b] (N = 26)
Density at founding	0.06	–0.36**
Concentration at founding	–0.05	0.28*

[a] Correlation coefficients between density and concentration at founding on the one hand and survival on the other are reported. Superscripts * and ** indicate statistically significant correlation coefficients at the 0.10 and 0.05 level, respectively (one-tailed test).
[b] Dependent variable: M&A firm = 1 and surviving firm = 0. Diaspora firms are excluded because they always have more than one auditor.

The findings produce partial support for the dual market structure argument (H1b,c). For one, all signs are in the predicted direction: small-firm survival is impeded by high density (with a correlation of 0.06) and not by high concentration (with a correlation of –0.05) at founding, whereas large-scale entrants suffer from the exit-enhancing impact of high concentration (with a correlation of 0.28) but not from high density (with a correlation of –0.36). Moreover, the expected correlation is statistically significant for the subsample of large firms ($p < 0.1$). Hence, the results suggest that competition is size-dependent, with small firms competing against small rivals and their large counterparts against large firms. This finding perhaps explains why the empirical studies on the influence of concentration on organizational performance have produced ambiguous evidence (compare, for example, Schoonhoven and Eisenhardt's, 1990, with Audretsch's, 1994, findings). With a sample of small firms, concentration may fail to have any effect on organizational performance if competition is ruled by a dual market structure.

7. Both industries compared – the size effect of human capital

As both studies were *not* designed as parts of an overall comparative research effort, the comparison can be but imperfect. However, the Flemish furniture data set contains a number of variables (Boone, 1992) that are close to the objective human capital measures in the Dutch audit industry study – particularly a measure of ownership, education and experience. Table X lists and compares both studies' measures that are central in the comparative analysis presented below. To (re-)trace the impact of covariates, a number of non-comparable variables is included as well (CEO's locus-of-control for the Flemish furniture industry, and density and demand for the Dutch audit industry).

Table XI depicts the results of a re-analysis

TABLE X
Measures compared

Variables	Measures	
	Flemish furniture industry	Dutch audit industry
Locus-of-control	Rotter questionnaire (see Table IV)	NR[a]
Size	Number of employees (see Table IV)	Number of registered auditors (see Table V)
Ownership	Founded by CEO and family firms (1) *versus* otherwise (0)	Proportion of partners (see Table V)
Education	CEO with (1) *versus* without (0) academic certificate	Proportion of auditors with academic certificate (see Table V)
Experience	Number of former employers (outside experience) and tenure (inside experience in years) within the current firm of CEO	Proportion of (outside) experienced auditors (see Table V)
Performance	Combination of three financial proxies (see Table IV)	Survivor or M&A status in 1992 (see Table V)[b]
Density	NR	Number of firms in the industry at founding (see Table V)
Demand	NR	Founded between 1970–1973 (1) *versus* 1974–1975 (0) (see Table V)

[a] NR = not relevant as the data cannot capture the associated variable.
[b] Diaspora firms are excluded as this subsample contains insufficient size variance.

TABLE XI
Objective and subjective human capital in Flemish furniture firms: the impact of the CEO's education, experience and locus-of-control

Variables	Regression coefficient[a]	
Constant	0.38	(0.56)
Size	–0.003*	(0.001)
Ownership	0.78**	(0.36)
Education	0.20	(0.31)
Outside experience	–0.11	(0.09)
Inside experience	0.01	(0.01)
Locus-of-control	0.10***	(0.04)
R-square	0.34	
F-value	3.98***	
Sample size	54	

[a] Unstandardized regression coefficient with * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$, and standard error in parenthesis.

(multiple regression) of the Flemish furniture industry data.

The findings confirm Section 5's (Table VI and, partly, VII) results on the statistically significant impact of organizational size (opposing H3a) and CEO's locus-of-control trait (supporting H7). A new result is the positive and significant coefficient of the ownership variable, which provides support for H4a. That is, firms currently managed by (family of) the founder are associated with higher financial performance. This result is in line with the well-established principal-agent argument that "inside" managers have more incentives to behave in accordance with the firm's interest than their "outside" colleagues. However, none of the objective human capital variables (education, outside experience and inside experience through tenure) generates significant results. Thus, the re-analysis of the whole Flemish furniture industry sample does not produce support for H5a or H6a. (Note, additionally, that the sign of the outside experience measure even opposes our prediction.)

So, ownership matters in both the Flemish furniture as well as the Dutch audit industry. However, objective human capital – reflected in education and experience of the CEO or personnel – only significantly influences organizational performance in the latter industry (Section 6). For this, at least three explanations may be plausible. First, the effect of subjective human capital in the form of the CEO's locus-of-control trait – as

measured for the Flemish furniture but not for the Dutch audit industry sample – may dominate over the impact of the CEO's objective human capital features because the craft of producing furniture requires teamwork with an important role for leadership. Second, the nature of the Flemish furniture industry is radically different from the Dutch audit industry's (Section 4). Particularly relevant may be two observations: (i) the Flemish furniture industry, as opposed to the Dutch audit market, is engaged in fierce (international) competition, whereas competition in the Dutch audit industry resembles career rather than product market rivalry (recall that in the latter industry bankruptcies are virtually absent); and (ii) the Dutch audit industry produces an intellectual service requiring highly educated and experienced personnel, implying that by the nature of the product the objective human capital features under study here are a competitive asset (which is not true for furniture firms). Related to this second explanation is the argument that reputation, as reflected in academic titles, is an important demand-enhancing factor in the audit industry. Third, the results may be different for small compared to large firms, either of which may be overrepresented in either sample. It is to this final issue that we now turn.

Additionally to the inter-industry comparison (Tables VIII and XI), the data can be re-analyzed to discover size effects (H8). To this aim, Table XII reports the findings for large *versus* small firms in the Flemish furniture (> 50 and ≤ 50 employees, respectively) and Dutch audit industry (> 1 and 1 auditor, respectively: note that for small firms the proportion of owners is 1 by definition).

What is striking about the results, is that the impact of the human capital variables is more

TABLE XII
The impact of human capital in large versus small firms

Variables	Small furniture firms[a]	Large furniture firms[a]	Small surviving audit firms[b]	Small M&A audit firms[b]	Mann-Whitney[c]	Large surviving audit firms[b]	Large M&A audit firms[b]	Mann-Whitney[c]
Constant	0.22	1.39						
	(1.17)	(0.83)						
Locus-of-control	0.10	0.12**						
	(0.06)	(0.06)						
Size	0.04	–0.005**						
	(0.02)	(0.002)						
Ownership	0.59	0.40				0.92	0.91	0.458
	(0.56)	(0.53)				(0.14)	(0.20)	
Education	–0.78	0.88**	0.29	0.33	0.393	0.36	0.49	**0.104**
	(0.51)	(0.39)	(0.43)	(0.49)		(0.31)	0.27)	
Outside experience	–0.03	–0.33	0.61	0.58	0.430	0.73	0.91	**0.094**
	(0.15)	(0.21)	(0.50)	(0.51)		(0.37)	(0.18)	
Inside experience	0.008	0.006						
	(0.02)	(0.02)						
Density			277.35	279.58	0.335	283.55	273.67	**0.063**
			(15.42)	(16.56)		(18.46)	(11.08)	
Demand			0.48	0.83	**0.020**	0.73	0.40	**0.052**
			(0.51)	(0.39)		(0.47)	(0.51)	
R-square	0.22	0.59						
F-value	0.97	4.87***						
Sample size	27	27	31	12		11	15	

[a] Unstandardized regression coefficient with * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$, and standard error in parenthesis.
[b] Average values with standard deviation in parenthesis.
[c] One-tailed p-value with statistically significant values printed in bold.

pronounced in *large* rather than small firms in *both* industries. This opposes H8. In the Flemish furniture industry, the positive influence of the large-firm CEO's education and internality is in line with H5a and H7. What is surprising is the *negative* – and nearly significant – impact of the CEO's education (with a regression coefficient of –0.78) in small firms, and the *negative* sign of the outside experience variable in both small and large businesses (with regression coefficients of –0.03 and –0.33, respectively) – opposing H5a and H6a. (The tenure variable does not work at all.) Apparently, the CEO's academic education and outside experience may be counterproductive in this industry. As yet, we have no explanation for these surprising results.[13] In the Dutch audit industry, all findings are in line with the results for the complete sample, as reported in Section 6. There, we proposed a career and takeover argument to explain the set of results relating to the human capital features of the auditors in large M&A and diaspora firms as opposed to their small and surviving counterparts. For example, large firms with highly educated (and moderately to highly experienced) personnel are more attractive takeover candidates (15 from 26 large entrants are merged or acquired in 1992 *versus* 12 from 43 of their small colleagues).[14]

A final statistically significant result relates to the size-dependent effect of demand at founding on large *versus* small-firm survival chances in the Dutch audit industry. Here, small audit firms established in times of (relatively) low demand (1970–1973) suffer from higher mortality rates than the large collaegue entrants (with an average value of the demand variable of 0.83 *versus* 0.40 of the M&A firms). Or, in other words: large low-demand entrants face a significantly lower likelihood of exit through M&A (at 1992) than their small low-demand counterparts. This finding suggests that large entrants can benefit from a (tangible and/or intangible) buffer, contrary to small entrants, in years of (relatively) unfavorable demand (cf. Fichman & Levinthal's, 1991, argument on the buffer-related honeymoon period after entry).

8. Appraisal

The message of this paper is four-fold. First, from a theoretical perspective the argument is a plea for *integrating* three strands in the literature while studying organizational performance: the belief is that the combination of industrial organization, organizational ecology and human capital arguments induces added value (Sections 2 and 3). Second, the *cross-section* study in the Flemish furniture industry emphasizes the role of *subjective* human capital – particularly the CEO's locus-of-control trait – in determining a firm's *financial* performance (Section 5). Third, the *longitudinal* study in the Dutch audit industry reveals the importance of *objective* human capital – specifically education and experience – as an explanatory variable of organizational *survival* (Section 6). Moreover, both studies introduce IO and/or OE elements by incorporating variables that capture aspects of market structure (concentration and density at founding in the Dutch audit industry study) and competitive strategy (cost leadership and product differentiation in the Flemish furniture industry study). Fourth, a preliminary comparison of both samples concentrates on the impact of *industry* and *size*-specific features in explaining organizational performance (Section 7). A number of results stands out: (i) the CEO's locus-of-control trait significantly contributes to explaining financial performance of Flemish furniture firms; (ii) both education and experience of the personnel of Dutch audit firm entrants are able to discriminate surviving from M&A from diaspora firms; (iii) in the Flemish furniture and Dutch audit industry, large scale is a disadvantage. Moreover, the results are more pronounced for large firms in both industries.

As said in the introduction, the combination of all pieces hopefully illustrates the added value of an integrative approach – the puzzle – to the study of organizational success and failure. However, this paper only describes part of the puzzle, since the data are as yet unable to cover the full picture. Our future research efforts will be directed at completing the puzzle, probably piece by piece. By way of example, we conclude this paper by briefly indicating three planned future analyses of the Dutch audit industry data. For one, we will re-do this paper's analyses after *enlarging* the data set

by including entrants from the pre-1970 and post-1975 periods in the data set. Next, we will elaborate on the IO and OE-type of market evolution and selection arguments – for example, by an in-depth study of the *dual market* structure hypothesis. Finally, the preliminary results of this paper's pilot study suggest that analyses on *career* elements of auditors may produce an important contribution to the explanation of the ups and downs of audit firms.[15] In all cases, we will differentiate the results by distinguishing (at least) four different destinations of firms: survival, merger, acquisition and diaspora.

Acknowledgements

We gratefully acknowledge Ilja Godfried and Maurice Zinken for their efforts put into data coding and input. The audit industry part is supported by a grant from the Dutch Organization for Scientific Research (NWO).

Notes

[1] Note that Audretsch (1994, p. 125) recently observed that "[t]he *handful* of empirical studies analysing exit [in IO] have generally concluded that the determinants of exit are symmetric to those for entry. However, these studies have typically been limited to examining broadly aggregated industry *rates* of entry and exit. In addition, there has been virtually no attempt to identify the characteristics of firms exiting from the industry" (first emphasis added). A recent example of such entry and exit *rate* studies is Mata (1994). The Dutch audit industry study reported in Section 6 is, as Audretsch's (1994), on the individual firm level.

[2] The fact that Table I lists differences in *emphasis* cannot be overemphasized. The concentration-density contrast is illustrative here. For example, many concentration indices in IO take account of the number of firms and Sutton's (1991) dual market structure argument underlines the co-existence of high concentration and high density.

[3] Again, this is only a difference in emphasis. In effect, profitability and survival may be – though not necessarily so (Winter, 1975; Van Witteloostuijn, 1988) – two sides of the same coin.

[4] Eisenhardt and Schoonhoven (1990, p. 527) conclude their paper by arguing that "[w]hat remains to be done are analyses of how founding conditions influence other important outcomes such as *survival* and profitability of young firms" (emphasis added). Section 6 is an example of a study focusing on the founding characteristics – survival nexus.

[5] Here a panel design, following cohorts of entrants over the years, would be convenient (but expensive and time-consuming).

[6] Another example is Van de Ven *et al.* (1984). However, their study is really exploratory in nature as their sample is composed of only 14 educational-software companies in the U.S.

[7] The number of observations in Table VI (N = 55: OLS regression) is considerably larger than the number in Table VII (N = 39: hierarchical regression) due to the fact that only a subsample of the participating firms revealed strategy data. However, considering the small sample we decided to include all observations in the OLS regression underlying Table VI.

[8] For the sake of brevity, strategy – locus-of-control interaction effects are not reported here. For this, see Boone and De Brabander (1994).

[9] Note, by the way, that in this industry (i) a cost leadership strategy is far more effective than a strategy of product differentiation and (ii) internal CEOs are more inclined to opt for a product differentiation strategy (for possible explanations, see Boone and De Brabander, 1994).

[10] In the Dutch audit market, "real" failures in the form of bankruptcies are virtually absent. Audit firms ceasing to exist for other reasons than M&A or diaspora appear to exit from the market following the death or retirement of the associated auditor(s). Therefore, we dropped these firms (N = 22) from our sample.

[11] The data permit to distinguish mergers from acquisitions on the basis of a number of plausible criteria (Pennings, Lee and Van Witteloostuijn, 1995). However, given the limited number of observations (N = 27 for M&A), we decided not to do so in the current pilot study.

[12] The pattern of results generated by multivariate logistic regression analyses does not deviate much from the univariate findings reported in Table VIII. Given the limited number of observation (N = 78), we only report the findings from the univariate Kruskal-Wallis and Mann-Whitney tests.

[13] Of course, the small sample size may imply biases. However, note that the size effect occurs in *both* samples.

[14] In a way, the adjectives "large" and "small" in our Dutch audit industry sample should be interpreted with caution, as even the largest firm in the sample features 41 auditors only (Table V). That is, *all* firms in the data set are small, although some are smaller than others. The former is not true for the Flemish furniture industry sample, because the largest firm here has 417 employees (Table IV).

[15] The career data are promising. The NIvRA membership lists (and those of NIvRA's predecessors) contain information (approximately on a two-year basis) on the jobs, including the names of the respective audit firms or outside enterprises, of *all* Dutch registered auditors (RAs) for, say, the post-war period (Buijink *et al.*, 1994).

References

Audretsch, D. B. (1994) 'Business Survival and the Decision to Exit'. *Journal of the Economics of Business* 1, 125–137.

Audretsch, D. B. and T. Mahmood, 1994, 'The Post-Entry Performance of New Firms', in A. van Witteloostuijn (ed.), *Market Evolution: Competition and Cooperation*, Boston: Kluwer Academic Publishers, pp. 243–253.

Bates, T., 1990, 'Entrepreneurial Human Capital Inputs and

Small Business Longevity', *Review of Economics and Statistics* **72**, 551–559.

Baum, J. A. C. and C. Mezias, 1992, 'Localized Competition and Organizational Failure in the Manhattan Hotel Industry, 1898–1990', *Administrative Science Quarterly* **37**, 580–604.

Boeker, W. P., 1991, 'Organizational Strategy: An Ecological Perspective', *Academy of Management Journal* **34**, 613–635.

Boone, C., 1992, 'Onderzoek naar het Verband tussen de Perceptie van Controle van Bedrijfsleiders en de Strategie en de Resultaten van Ondernemingen in de Meubelindustrie', Ph.D. Thesis, Antwerpen: RUCA.

Boone, C. and B. de Brabander, 1993, 'Generalized Versus Specific Locus of Control Expectancies of Chief Executive Officers', *Strategic Management Journal* **14**, 619–626.

Boone, C. and B. de Brabander, 1994, 'The Impact of the Locus of Control of Chief Executive Officers on Small Firm Performance: An Empirical Investigation of an Integrative Framework', *Research Memorandum*, Maastricht: University of Limburg and MANOR.

Boone, C. and A. van Witteloostuijn, 1994a, 'Survival, Merger and Acquisition, and Diaspora of Dutch Audit Firms in 1992: An Exploratory Study of 100 1970–1975 Entrants', *Research Memorandum*, Maastricht: University of Limburg and MANOR.

Boone, C. and A. van Witteloostuijn, 1994b, 'Hypercompetitive Rivalry: Flexibility, Inertia and Performance', *Research Memorandum*, Maastricht: University of Limburg and MANOR.

Boone, C. and A. van Witteloostuijn, 1995, 'Industrial Organization and Organizational Ecology: The Potentials for Cross-Fertilization', *Organization Studies* **16**, 265–298.

Bradburd, R. and R. E. Caves, 1982, 'A Closer Look at the Effect of Market Growth on Industries' Profits', *Review of Economics and Statistics* **64**, 635–645.

Brockhaus, R. H., 1980, 'Psychological and Environmental Factors which Distinguish the Successful from the Unsuccessful Entrepreneur: A Longitudinal Study'. *Academy of Management Proceedings*, 368–372.

Brüderl, J., P. Preisendörfer and R. Ziegler, 1992, 'Survival Chances of Newly Founded Business Organizations', *American Sociological Review* **57**, 1–15.

Buijink, W. F. J., S. J. Maijoor, A. van Witteloostuijn and M. W. H. Zinken (1995) *The Evolution of the Structure of the Dutch Audit Industry: A Descriptive Study of the 1880–1990 Period*, Amsterdam: Limperg Instituut.

Carroll, G: R., 1985, 'Concentration and Specialization: Dynamics of Nich Width in Populations of Organizations', *American Journal of Sociology* **90**, 1262–1283.

Carroll, G.R. and M. T. Hannan, 1989a, 'Density Dependence in the Evolution of Newspaper Populations', *American Sociological Review* **54**, 524–541.

Carroll, G.R. and M.T. Hannan, 1989b, 'Density Delay in the Evolution of Organizational Populations: A Model and Five Empirical Tests', *Administrative Science Quarterly* **34**, 411–430.

Carroll, G. R. and J. R. Harrison, 1993, 'Evolution Among Competing Organizational Forms', *World Futures* **37**, 91–110.

Caves, R. E. and M. E. Porter, 1977, 'From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition', *Quarterly Journal of Economics* **91**, 241–261.

Dunne, T., M. J. Roberts and L. Samuelson, 1988, 'Patterns of Firm Entry and Exit in U.S. Manufacturing Industries', *RAND Journal of Economics* **19**, 495–515.

Dunne, T., M. J. Roberts and L. Samuelson, 1989, 'The Growth and Failure of U.S. Manufacturing Plants', *Quarterly Journal of Economics* **104**, 671–698.

Eisenhardt, K. M. and C. B. Schoonhoven, 1990, 'Organizational Growth: Linking Founding Team, Strategy, Environment, and Growth among U.S. Semiconductor Ventures, 1978–1988', *Administrative Science Quarterly* **35**, 504–529.

Fichman, M. and D. A. Levinthal, 1991, 'Honeymoons and the Liability of Adolescence: A New Perspective on Duration Dependence in Social and Organizational Relationships', *Academy of Management Review* **16**, 442–468.

Fisher, F. M., 1989, 'Games Economists Play: A Noncooperative View', *RAND Journal of Economics* **20**, 13–137.

Fisher, F. M., 1991, 'Organizing Industrial Organization: Reflections on the *Handbook of Industrial Organization*'. *Brooking Papers on Economic Activity* **22**, 201–240.

Ghemawat, P. and B. Nalebuff, 1985, 'Exit', *RAND Journal of Economics* **15**, 184–194.

Ghemawat, P. and B. Nalebuff, 1990, 'The devolution of declining industries', *Quarterly Journal of Economics* **105**: 167–186.

Gilbert, R. J., 1989, 'Mobility Barriers and the Value of Incumbency', in R. Schmalensee and R. D. Willig (eds.), *Handbook of Industrial Organization*, Amsterdam: North-Holland, pp. 475–536.

Govindarajan, V., 1989, 'Implementing Competitive Strategies at the Business Unit Level: Implications of Matching Managers to Strategies', *Strategic Management Journal* **10**, 251–269.

Hannan, M. T. and G. R. Carroll, 1992, *Dynamics of Organizational Populations: Density, Legitimation and Competition*, New York: Oxford University Press.

Hannan, M. T. and J. Freeman, 1987, 'The Ecology of Organizational Founding: American Labor Unions, 1836–1985', *American Journal of Sociology* **92**, 910–943.

Hannan, M. T. and J. Freeman, 1988, 'The Ecology of Organizational Mortality: American Labor Unions, 1836–1985', *American Journal of Sociology* **94**, 25–52.

Hannan, M. T. and J. Freeman, 1989, *Organizational Ecology*, Cambridge, MA: Harvard University Press.

Jovanovic, B., 1982, 'Selection and the Evolution of Industry', *Econometrica* **50**, 649–670.

Jovanovic, B. and S. Lach, 1989, 'Entry, Exit, and Diffusion with Learning by Doing', *American Economic Review* **79**, 690–699.

Maijoor, S. J., W. F. J. Buijink, A. van Witteloostuijn and M. W. H. Zinken, 1993, 'Long-Term Concentration in the Dutch Audit Market: The Use of Auditor Association Membership Lists in Historical Research', *Abacus* **31**, 152–177.

Mata, J., 1994, 'Sunk Costs and the Dynamics of Entry in Portuguese Mnufacturing', in A. van Witteloostuijn (ed.), *Market Evolution: Competition and Cooperation*, Boston: Kluwer Academic Publishers, pp. 265–282.

Miller, D. and J.M. Toulouse, 1986a, 'Strategy, Structure, CEO Personality and Performance in Small Firms', *American Journal of Small Business* **10**, 47–62.

Miller, D. and J. M. Toulouse, 1986b, 'Chief Executive personality and Corporate Strategy and Structure in Small Firms', *Management Science* **32**, 1389–1409.

Oswald, S. L. and J. S. Jahera Jr., 1991, 'The Influence of Ownership on Performance: An Empirical Study', *Strategic Management Journal* **12**, 321–326.

Panzar, J. C., 1989, 'Technological Determinants of Firm and Industry Structure', in R. Schmalensee and R. D. Willig (eds.), *Handbook of Industrial Organization*, Amsterdam: North-Holland, pp. 3–60.

Pennings, J. M., K. Lee and A. van Witteloostuijn, 1995, 'Population Ecology and Firm Resources: A Study of Professional Service Firms', *Research Memorandum*, Philadelphia: Wharton Business School.

Porter, M. E., 1980, *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, New York: Free Press.

Porter, R. H., 1991, 'A Review Essay on *Handbook of Industrial Organization*', *Journal of Economic Literature* **24**, 553–572.

Preisendörfer, P. and T. Voss, 1990, 'Organizational Mortality of Small Firms: The Effects of Entrepreneurial Age and Human Capital', *Organization Studies* **11**, 107–128.

Scherer, F. M. and D. Ross, 1990, *Industrial Market Structure and Economic Performance*, Boston: Houghton Mifflin.

Schmalensee, R. D., 1989, 'Inter-Industry Studies of Structure and Performance', in R. Schmalensee and R. D. Willig (eds.), *Handbook of Industrial Organization*, Amsterdam: North-Holland, pp. 951–1010.

Schmalensee, R. D. and R. Willig (eds.), 1989, *Handbook of Industrial Organization* (two volumes), Amsterdam: North-Holland.

Sutton, J., 1991, *Sunk Costs and Market Structure: Price Competition, Advertising and the Evolution of Concentration*, Cambridge, MA: MIT Press.

Thomas, A. S., R. J. Litschert and K. Ramaswamy, 1991, 'The Performance Impact of Strategy-Manager Coalignment: An Empirical Examination', *Strategic Management Journal* **12**, 509–522.

Tirole, J., 1988, *The Theory of Industrial Organization*, Cambridge, MA: MIT Press.

Van de Ven, A. H., R. Hudson and D. M. Schroeder, 1984, 'Designing New Business Startups: Entrepreneurial, Organizational, and Ecological Considerations', *Journal of Management* **10**, 87–107.

Van Witteloostuijn, A., 1988, 'Maximising and Satisficing: Opposite or Equivalent Concepts?', *Journal of Economic Psychology* **9**, 289–313.

Van Witteloostuijn, A., 1995, 'Bridging Behavioral and Economic Theories of Decline: Organizational Inertia, Strategic Competition and Chronic Failure', *Research Memorandum*, Maastricht: University of Limburg and MANOR.

Waterson, M., 1992, 'Book Review of the *Handbook of Industrial Organization*', *Managerial and Decision Economics* **13**, 171–177.

Winter, S.G., 1975, 'Optimization and Evolution in the Theory of the Firm', in R. H. Day and T. Groves (eds.), *Adaptive Economic Models*, New York: Academic Press, pp. 73–118.