ELSEVIER

Long Range Planning ■■ (2006) ■■■–■■■

LRP long range planning

www.lrpjournal.com

From Scooters to Choppers: Product Portfolio Change and Organizational Failure

Evidence from the UK Motorcycle Industry 1895 to 1993

Filippo Carlo Wezel and Arjen van Witteloostuijn

This article explores the conditions under which organizational change increases the risk of organizational failure. To reach this goal, we examine the pros and cons of flexibility and inertia arguments. Empirically, we measure the survival consequences of product portfolio expansion in the British motorcycle industry during the period from 1895 to 1993. A key finding is that the correlation of product portfolio expansion with increased risk of business failure is moderated by the organization's portfolio width, which we interpret as a proxy of the firm's capabilities. Whilst narrow portfolio organizations face an increased risk of failure after a portfolio expansion, their broad portfolio counterparts enhance their survival chances by engaging in further expansions. We conclude that although organizational change is risky, it may provide long-term rewards, especially for broad-portfolio organizations leveraging their developed capabilities. Managerial insights include considerations of the point when portfolio expansion moves from being too risky to becoming an advantageous strategy for a firm.

© 2006 Elsevier Ltd. All rights reserved

Introduction

A critical aspect of strategic management is a firm's ability to identify changes in the market environment, to sense an opportunity, and then to seize it by launching and implementing appropriate changes. Change allows organizations to leverage their existing capabilities and related experiences to explore and exploit new opportunities. Needless to say, change is difficult to implement, and the literature is full of contributions underscoring the multidimensionality of the challenge.[1] A vast body of research in organizational sociology, for instance, provides evidence that organizations are slow to change because of inertia, and that changes in core values are likely to decrease

0024-6301/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.lrp.2005.11.001

organizational survival.[2] Empirical research within this tradition also demonstrates that political and social constraints complicate the implementation of organizational change initiatives.

So change is both necessary and risky. The interesting question, then, is how much change can a firm safely engage in? Is there a 'right' amount of change, given the nature of the firm's capabilities? We believe that answering these questions from the theoretical point of view requires taking an integrative account of capability-based and inertia-grounded arguments to highlight the complementarities between these perspectives.[3] Empirically, we adopt a longitudinal research design that is unusual in covering the entire history of an industry. Much of the strategy literature concerns the short-term consequences of organizational change: here, however, we contribute to the literature by focusing on its effects for long-term performance (i.e., survival).

We apply our reasoning to the case of *product portfolio expansion*. We selected the case of expansion because the extant literature shows that the launch of (one or more) new products requires several organizational adjustments which can affect performance.[4] In particular, we opted for investigating the effects of expansion along a technological dimension (i.e., the increase in portfolio width measured in terms of motorcycle power, proxied by engine capacity). We build on technology management literature to back our claim that the risks of change are proportional to the distance of the new product(s) from the firm's current portfolio base.[5] The underlying logic is that organizational change will affect organizational performance negatively or positively according to (i) the *magnitude* of such a change and (ii) the *capabilities* of the specific firm under investigation. We test our hypotheses on data from the British motorcycle industry in the period from 1895 to 1993. The results support both the arguments: product portfolio expansion may decrease or increase the chances of organizational survival, depending upon the firm's current portfolio base. This offers support for our call for a complex and subtle theory of the performance effect of organizational change that explains *why* and *when* specific changes may or may not work well in the context of a *longitudinal* research design that focuses on *long-term* performance consequences.

The performance implications of portfolio change also suggest concerns as to what constitutes firm outcomes. The study of the consequences of portfolio changes often remains unsatisfactory with much of the empirics focusing on short-term outcomes within a cross-sectional study design. If the research design becomes longitudinal and covers an extended period of time it seems more prudent to invoke institutionally or contextually invariant metrics rather than accounting proxies.[6]

…product portfolio expansion may decrease or increase the chances of organizational survival, depending upon the current portfolio base.

The case of product portfolio expansion

This article explores one particular type of organizational change: the case of product portfolio expansion. We believe this to be an important example of organizational change: after all, a key aspect of any corporate strategy is the portfolio of products that an organization offers to its customers (the '*where to compete*' question), which in turn contributes to the design of its internal processes and routines (the '*how to compete*' question). In this sense, product portfolio expansion is closely related to the well-studied issue of *horizontal* product differentiation.[7] In our context, we are able to focus on different product varieties within the boundaries of a single national industry, rather than studying the effects of cross-industry or geographical differentiation.

Introducing changes to the product portfolio implies a strategic repositioning that is likely to generate a cascade of associated changes, both inside and outside the organization. Different products may require different production processes, logistic procedures, pricing policies, marketing campaigns etc. In the motorcycle industry, product classes (defined on the basis of cc-segmentation) differ significantly, both in terms of expertise and investment required in the production process (e.g., the technological sophistication of high-capacity motorcycles is incomparable with that of

scooters) and of market segmentation (aimed at, e.g., 'elegant' ladies and 'cool' young men, or at the leather clad macho-type audience of such movies as 'The Wild One' and 'Easy Rider' who '*lived for their bikes*'[8].) Indeed, authors have noticed that '*scooters and motorcycles are so different in terms of both product architecture and manufacturing process that their belonging to the same industry could be put into discussion*'.[9]

A look at the product portfolio of BMW, Ducati or Harley Davidson suggests that organizational identity is heavily intertwined with competitive positioning. While these producers currently offer 21, 15 and 27 different models respectively, all of them are clustered into a few cc-classes. BMW preserves its premium luxury image by avoiding the small-capacity segment, and similarly Ducati's 2003 product range of 15 models are all in the high-capacity (over 600 cc) segment.

In the case of Harley-Davidson, the world famous large-capacity (i.e., 800–1200 cc) producer, this concentration is the result of a hard lesson. At the time of the 1960s scooter craze, most British companies continued to make large-capacity motorcycles (often based on dated designs that no longer attracted customer interest). But the progressive polarization of the market stimulated some other producers to enter the small-capacity segment: a transition which led many of them to encounter problems. Thus when, towards the end of the decade, Harley Davidson entered the small/medium (125–250 cc) range, the brand lost identity with its traditional clients, and major losses and a sudden decline in market share followed. Within a few years, the marque had returned to its traditional high-power production range.

We should stress that our empirical goal is to discuss the effects of organizational change along a *technological* dimension. Technology management literature suggests that the inertial forces encountered during product portfolio expansion produce resistance proportionally to the distance of the new product(s) from existing organizational capabilities. The likelihood that a change cascade increases the chance of failure depends on the capacity of the firm to 'digest' the expansion, whether minor or significant. Empirical research in strategic management seems to agree with this claim, yielding examples such as EMI's lack of capabilities to produce and market CAT scanners properly, which stopped it from capitalizing on one of the greatest innovations of the last century, or Polaroid's central capabilities, which, while they were a key strength during the 1980s, greatly reduced its ability to leverage the digital imaging technology of the 1990s.[10]

The likelihood that a change cascade increases the chance of firm failure depends on its capacity to 'digest' the expansion.

Given this logic, we adopt the technological dimension to focus on the effects on the organizational hazard of exit of three factors: the *state* (or width) of the organization's product portfolio (Hypothesis 1), the *change* (or expansion) of this portfolio (Hypothesis 2), and the state–change *interaction* (Hypothesis 3). In examining this interaction, we elaborate on the contingent relationship between the counter-acting pros and cons of change. Figure 1 spells out the theoretical logic of the article in greater detail.

Product portfolio width

As far as the main effect of product portfolio width is concerned, scholars of both industrial economics (the backbone of much strategy theory) and of marketing seem to agree that horizontal product differentiation is likely to lead to greater profitability, *ceteris paribus*. The rationale supporting this claim relates to a straightforward argument from neo-classical economics: product differentiation reduces substitutability among competing products, thus steepening the slope of the demand curve. Briefly stated, product differentiation allows producers to charge higher prices with a less-than-proportional reduction in volume, increasing the firm's profits. In particular,

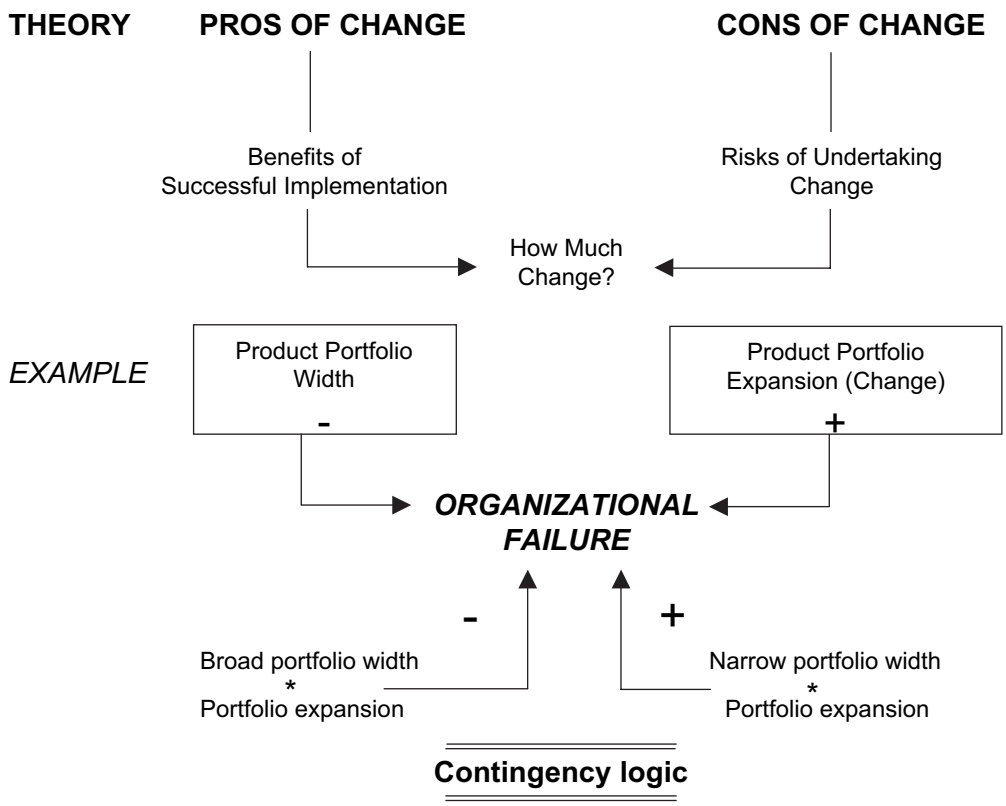

Figure 1. A summary of the overall logic

industrial economics relates high product differentiation to high profitability as a consequence of the erection of barriers to entry.[11]

In a similar vein, the marketing literature indicates that differentiated products, targeted at multiple groups of consumers, generate higher profits by increasing the firm's market share.[12] Thus firms with a wide product portfolio can benefit from an array of competitive cost or benefit scope economy advantages associated with the combined production and selling of different products. These can include cost advantages such as cost reductions resulting from the multi-product sharing of input resources (shared raw material, production machinery), or such benefit advantages as when multi-market branding transfers a strong brand name from one market or product to the other, or joint R&D generating new process technologies or product features that spill over from one market or product to the other.

The argument that organizational performance is positively associated with organizational scope has received robust support in a large number of empirical studies in a variety of industries over several decades.[13] Research in strategic management has built on these findings, stressing the benefits associated with scope economies — i.e., with a broad product portfolio.[14] This gives our benchmark Hypothesis 1.

H1. *The broader an organization's product portfolio width, the lower is the organizational hazard of exit.*

Product portfolio expansion

Taking advantage of these benefits is not without a cost. Expanding the product line of a company requires several changes and adjustments that can disrupt the smooth functioning of the organization. An organization's product portfolio in fact can be considered as involving two of the four

categories used by Hannan and Freeman to define an organization's core — i.e., organizational goals and marketing strategies. Internally, technologically distant products are likely to require firms to develop new knowledge and implement new routines, while externally, changing a product portfolio may imply a strategic repositioning of the firm towards new customers, distribution channels and advertising outlets.

…technologically distant products are likely to require the development of new knowledge and new routines [and] a strategic repositioning of the firm's marketing effort.

Organizational inertia theory argues that a change that is close to any of the dimensions that define an organization's core is likely to increase the likelihood of failure, because such core changes harm the organization's accountability, reliability and reproducibility — both internally and externally.[15] The internal argument assumes that routines improve through repeated use, and hence a change in them implies a less efficient execution. Externally, replacing the content of exchanges due to new product introductions or, even worse, the partners with whom the firm trades, consumes time and resources. On top of that, as has been noted above, too-drastic a product portfolio change risks harming the organization's legitimacy in the eyes of key outside stakeholders, such as customers and shareholders.

A 'pure' inertia argument implies the disruptive effect of any core change, independently from the intensity of the modification. However, the nature of the change under investigation here (i.e., expansion of the product portfolio) suggests that the strength of the internal and external inertial forces is likely to be proportional to the distance of the new products from the existing technological base. In other words, the more different the added products are from the current portfolio, the larger the probability that this expansion will trigger a series of changes which will affect core organizational values, and which may be hard to foresee accurately in advance. In our empirical setting, this suggests that the more distant the new motorcycle is from the current motorcycle range on offer (in terms of cc horsepower), the more likely it will be to lead to the organization's failure. So, organization ecology's inertia logic produces the benchmark Hypothesis 2.

H2. *The broader an organization's products portfolio expansion, i.e., the larger the distance of the added product from the current product portfolio, the higher the organizational hazard of exit.*

Product portfolio width and change interacted

On the basis of Hypotheses 1 and 2, we are now ready to develop our logic. How does the width of an organization's current product portfolio interact with product portfolio expansion in determining organizational failure? This pertains to the *portfolio width * portfolio expansion* interaction. Strategic management logic seems to suggest that organizations can enhance their competencies to deal with change by operating a broader product line. Firms operating in multiple domains develop a variety of knowledge resources necessary to deal with the risks associated with experimentation.[16] After all, by doing so, the firm develops a wider range of organizational capabilities by learning from sequential experimentation and knowledge accumulation. This implies that the larger the pool of experiences or resources possessed by firm, the larger the probability of finding a solution through the mere recombination of existing knowledge, and the smaller the need for further changes. This implies that widely differentiated, or broad portfolio, organizations will be less sensitive to the negative consequences of change, as suggested by organizational ecology's inertia theory.

…organizational ecology inertia theory suggests broad portfolio organizations will be less sensitive to the negative consequences of change.

Thinking about organizational change through this lens adds a further layer to the discussion. As current capabilities are accumulated over time through a series of risky changes, organizations engaging in a series of small incremental adjustments rather than radical ones should be less likely to fail. Research in strategic management seems to agree with this claim. Baden-Fuller and Stopford, for instance, have shown how firms obtained exceptional returns by engaging in a sustained programme of change.[17] However, maintaining such a set of skills and competencies is very costly. After reaching a broad scope, companies may improve their survival by leveraging their differentiated set of capabilities. Operating in a set of (sub-)markets both provides a platform for adding further new products, and allows the firm to absorb the risks associated with such expansion. The literature on core competencies is in line with this interpretation: a firm can gain long-term benefits by expanding its range of production to those products where its competencies — e.g., in production, marketing and distribution — can be properly exploited.[18] The classic case of Honda has been well-analyzed, and Apple, Intel and Microsoft provide other examples of the successful strategy of obtaining long-term benefits by implementing a set of changes that would have been risky for competitors. Based on this evidence, we argue that when the firm's product portfolio is highly differentiated, the negative consequences associated with large-scale changes will be fully overcome, ultimately improving organizational survival. This gives our interaction Hypothesis 3.

H3. *The width of an organization's product portfolio moderates the positive effect of product portfolio expansion on the organizational hazard of exit. Thus portfolio expansion by narrow portfolio organizations increases the organizational hazard of exit, whereas the opposite holds true for broad portfolio organizations.*

Methods

Data

Our empirical setting is the British motorcycle industry in the period from 1895 to 1993.[19] From a wide array of data sources, we have collected information about all the 648 motorcycle producers that ever operated in the United Kingdom, including such well-known brand names as BSA, Norton and Triumph.[20] The history of the UK motorcycle industry has been the object of numerous discussions and in-depth studies.[21] Although interpreted from different perspectives (either as purposefully leveraging core competencies, or as an accidental emergent strategy[22]), the growth of the Japanese industry after WWII has been widely recognized as the cause of the decline of this industry in the United Kingdom. Prior to the present study, however, no academic study has investigated the entire evolution of this industry using the hazard rate methodology, as we do here. Besides testing our theoretical hypotheses, this method allows us to analyze the evolution of the British motorcycle industry by explicitly taking on board issues of organizational change and failure. Thus our study is complementary to the extant literature about this industry.

Indeed this type of panel data set is particularly appropriate for the study of such dynamic phenomena as organizational change and failure. The number of failures (i.e., exits) over the history of the British motorcycle industry is very large: in effect, by 1993 only four British motorcycle producers were still active, a huge drop from a peak of 182 firms in 1923 (see Figure 2).

In terms of product portfolio (expansion), the motorcycle industry offers ample opportunities for in-depth research because of the nature of the products involved, with the key observable feature

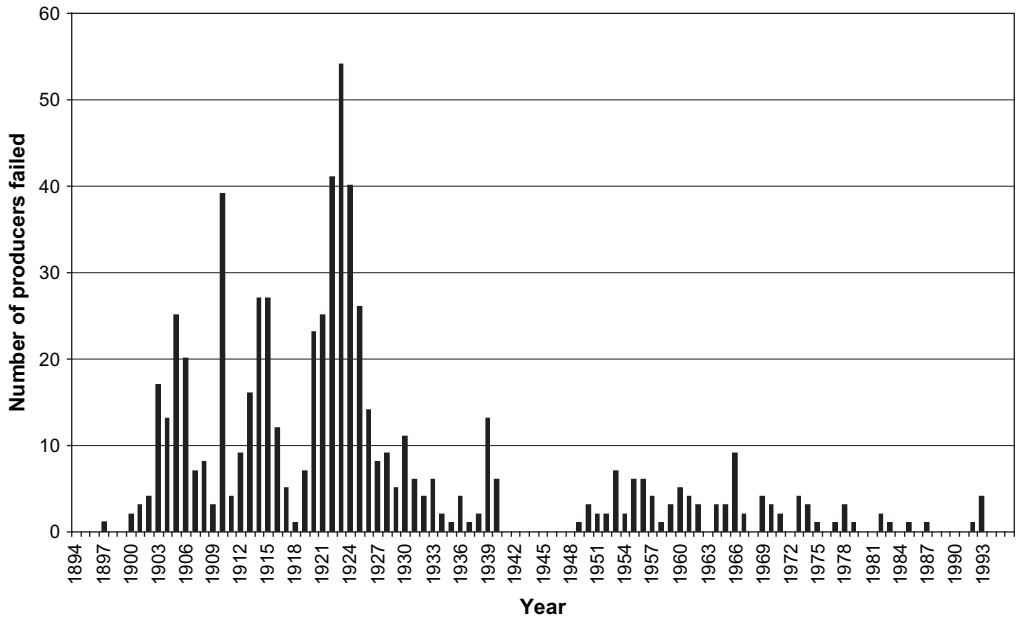

Figure 2. Number of exits of motorcycle producers in the UK in 1895–1993

of products being the cc-horsepower of the engines. It may, of course, be argued that measuring organizational change along a single dimension can be too limited. However, as we discuss below, other studies have successfully relied on this technological dimension to differentiate producers' strategies within this industry.

Variables

In relation to the contingency central to this article's argument, the data set includes annual firm-level information about the number of cc-types produced, and entry and exit events, from which all independent and dependent variables can be constructed. In line with the organizational ecology tradition, the dependent variable in this study — *Organizational Performance* — is represented by a key vital event: *Organizational Failure*.[23] Following previous studies in manufacturing industries, we define the organization's product portfolio (or niche) width with reference to technological space.[24] That is, we measure the range of motorcycles offered by each producer — *Portfolio Width* (lagged) — by the spread of the engine capacity of their motorcycles (Hypothesis 1). This measure represents a proxy of the firm's technological capabilities.[25]

We define the extent of expansion upon a product(s) introduction - *Portfolio Expansion* - as the difference between the new and the old producer's portfolio width (Hypothesis 2). Although Table 2 points to low average values of portfolio expansions, the statistics are inflated by the large number of zeros in our sample — i.e., no change. Overall, 375 portfolio expansions took place during the period under investigation. The mean value of these expansions was 102.64 with a standard deviation of 89.54 and a maximum of 550. As the 'real' consequences of *content* change can be observed only after controlling for *process* effects, the estimates obtained include both the content (product portfolio expansion) and a proxy for the process (*Time Since Last Event*) consequences associated with such changes. The interaction of *Portfolio Width* and *Portfolio Expansion* — the *Portfolio Width* * *Portfolio Expansion* product term (Hypothesis 3) — completes our set of independent variables.

Following in the footsteps of the organizational ecology tradition, we selected a series of twelve control variables. We introduced three dummy variables to code different entry modes: *DeNovo* for inexperienced organizations, *DeAlio* for lateral entrants, and *DeIpso* for firms that entered through a merger or resurgence of motorcycle manufacturers.[26] We tested for the negative impact of firm

size (i.e., scale) on organizational mortality by counting the number of plants owned each year by the focal firm — *Firm Size* (in logs).[27] We benchmarked organizational *Age* from the midpoint of the year of entry. Following this logic, those firms entering and exiting in the same year received a tenure value of .5.[28] To account for the possibly curvilinear effect of organizational age, we also included the quadratic term $Age^{2.}$

We proxied competition among firms in proportion to their degree of overlapping product ranges.[29] We summed the values obtained according to this rationale. Thus, for instance, an organization that produces 125, 250 and 350 cc motorcycles receives a value of 1/3 of competition from those firms that it meets in only a single niche — e.g., 125 cc —, but a value of 1 from those rivals that offer the same complete range of products. These *Portfolio Overlap* measures were recorded on a yearly basis. To further control for positional advantages relative to competitors, we yearly updated the distance of the midpoint of the firm's product portfolio from the market center — *Distance Above Market Center* and *Distance Below Market Center*. We defined the market center as the average portfolio center across all incumbent producers.

The British motorcycle industry had a dominant production area in the geographic triangle between the cities of Birmingham, Coventry and Wolverhampton, where almost half (278 out of 648) of all UK manufacturers were located. To control for the potential benefits stemming from knowledge spillover and other network effects, we created a dummy variable *District* to identify organizations with headquarters in that area. The potentially different hazard rate for

Table 1. Description of Variables

Control Variables

Historical Control Variables

WWI = dummy taking the value of 1 for the period 1914—1918, and 0 otherwise.

WWII = dummy taking the value of 1 for the period 1939—1945, and 0 otherwise.

GDP per Person = gross domestic product per person in the UK.

Motor Vehicle Production = number of motor vehicles — other than motorcycles — produced yearly in the UK.

Industry Age = number of years elapsed since 1895.

Organizational Control Variables

Firm Size = logarithm of the number of plants per firm per year.

Age = number of years elapsed since founding.

Portfolio Overlap = proportion of overlapping production between the focal firm and the other incumbent organizations.

District = dummy variable taking the value of 1 to identify those organizations having their headquarters in the Birmingham-Coventry-Wolverhampton area, and 0 otherwise.

DeAlio/DeIpso/DeNovo = lateral entrants/firms that entered through a merger or resurgence of motorcycle manufacturers/inexperienced producers.

Distance Above Market Center = distance between the center of the organization's product portfolio and the center of the market (average of all incumbents), but only for firms located *above* the market center.

Distance Below Market Center = distance between the center of the organization's product portfolio and the center of the market (average of all incumbents), but only for firms located *below* the market centre.

Independent Variables

Portfolio Width = time-varying measure of the spread of the engine capacity of an organization's motorcycles (Hypothesis 1).

Portfolio Expansion = time-varying variable measuring the difference between old and current portfolio width upon a portfolio expansion (Hypothesis 2).

Time Since Last Change = number of years elapsed since the last product portfolio expansion.

Portfolio Width * Portfolio Expansion = product term of Portfolio Width and Portfolio Expansion (Hypothesis 3).

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
WWI	4685	0.09	0.29	0.00	1.00
WWII	4685	0.04	0.20	0.00	1.00
Age	4685	13.28	14.97	0.50	76.00
Age2	4685	400.43	810.01	0.25	5776.00
DeAlio	4685	0.48	0.50	0.00	1.00
DeIpso	4685	0.10	0.30	0.00	1.00
District	4685	0.53	0.51	0.00	5.00
GDP per Person	4685	5.99	20.70	0.20	258.91
Motor Vehicle Production	4685	309.22	551.76	0.00	2332.00
Own Engine	4685	0.59	0.49	0.00	1.00
Industry Age	4685	3.64	0.45	0.00	4.68
Distance Above Market Center	4685	66.57	109.96	0.00	738.07
Distance Below Market Center	4685	66.34	80.91	0.00	371.38
Portfolio Overlap	4685	44.42	27.19	0.00	122.00
Firm Size (# of plants)	4685	1.84	1.28	1.00	11.00
Portfolio Width	4685	210.11	211.38	0.10	975.00
Time Since Last Change	4685	1.98	4.60	0.00	22.00
Portfolio Expansion	4685	8.21	37.63	0.00	550.00

organizations that developed and used their own engines was taken on board by introducing the *Own Engine* dummy variable.[30] A time-varying clock measuring *Industry Age* (observation year minus 1895, in logs) was added to control for the remaining unobserved effects that took place over the industry lifecycle.

Finally, we include four measures of important economic and historical circumstances. To control for the general economic climate of the focal country and for latent demand for transportation, we created a time-varying variable measuring the gross domestic product per person — *GDP per Person*.[31] The annual output of motor vehicles — other than motorcycles — produced in the UK was entered as a proxy for substitutes' rivalry, labeled *Motor Vehicle Production*.[32] Two dummies were constructed to control for the influence of *WWI* and *WWII*. Tables 1 and 2 report respectively, the descriptions and statistics for all variables.

Method and model

We employ an advanced multivariate hazard rate estimation technique. This technique estimates the time-varying determinants of the stochastic probability of observing a specific event. Our event (the dependent variable) is organizational exit or mortality, the ultimate measure of organizational failure, the determinants of which have been introduced above (the independent and control variables). We are interested in estimating the impact of an organization's product portfolio width, product portfolio expansion and their interaction on the stochastic probability that the focal organization will exit from the market. Technically, we estimate the probability that organization x will fail and exit from the market in year t, given that this producer was still active in year $t-1$, using this organization x's product portfolio width in year $t-1$ (Hypothesis 1), its product portfolio expansion (if any) in year t (Hypothesis 2) and these variables' product term (Hypothesis 3) as the key predictors (next to a series of alternative determinants — i.e., the control variables introduced above).

Table 3. Maximum likelihood estimates of the complementary log-log models for exit rates of UK motorcycle producers in 1895–1993

Variables	Model 1	Model 2	Model 3	Model 4 1946–93
Constant	−4.17** (.56)	−4.25** (.56)	−4.30** (.57)	−29.7** (14.6)
WWI	−.06 (.17)	−.06 (.17)	−.07 (.17)	
WWII	.61** (.31)	.60** (.30)	.60** (.30)	
Age	−.07** (.01)	−.08** (.01)	−.08** (.01)	−.08** (.02)
Age2	.001** (.0002)	.001** (.0002)	.001** (.0002)	.001** (.0003)
Firm Size (logged)	−.96** (.11)	−.95** (.11)	−.96** (.11)	−.47** (.19)
Industry Age (logged)	.70** (.17)	.72** (.18)	.72** (.18)	6.1* (3.5)
DeAlio	−.62** (.10)	−.62** (.10)	−.62** (.10)	−.02 (.27)
DeIpso	−.74** (.14)	−.73** (.14)	−.74** (.14)	−.51* (.29)
District	−.35** (.08)	−.36** (.09)	−.36** (.09)	−.15 (.21)
GDP per Person	−.013** (.005)	−.013** (.005)	−.013** (.005)	−.014* (.008)
Motor Vehicle Production	.0002 (.0002)	.0001 (.0002)	.0001 (.0002)	.0004 (.0005)
Own Engine	.06 (.09)	.05 (.09)	.05 (.09)	−.30 (.24)
Portfolio Overlap	.014** (.002)	.014** (.002)	.014** (.002)	.09** (.03)
Distance Above Market Center	.001** (.0005)	.0008* (.0005)	.0009* (.0005)	.004* (.002)
Distance Below Market Center	.002** (.0007)	.002** (.0007)	.002** (.0007)	.005* (.002)
Portfolio Width		−.0004** (.0002)	−.00033* (.0002)	−.0013 (.001)
Portfolio Expansion		.003** (.0008)	.0045** (.001)	.007* (.004)
Time Since Last Change		−.07** (.03)	−.06** (.03)	−.02 (.02)
Portfolio Width * Portfolio Expansion			−.00002** (−.000008)	−.00004 (.00003)
Number of Exits	597	597	597	83
Log Likelihood	−1524.43	−1519.53	−1516.39	−240.19

** $p < .05$; * $p < .10$; Standard errors are in parentheses; Two-tailed t-tests for hypothesis testing.

For these multivariate hazard rate analyses, we divide the life of each producer in organization-years.[33] The final data set includes the life of 648 firms, divided into 4,685 firm-year observations, and records a total of 597 exits. A complementary log-log model specification was selected to produce the estimates.[34]We ran four different models, as explained below. The estimates were obtained with the Maximum Likelihood Estimation method, using version 8 of STATA.

The empirical evidence

Table 3 presents the maximum likelihood estimates for four complementary log-log models of organizational failure. Model 1 includes all the control variables. In Model 2, we introduce the main effects of our two variables of theoretical interest in Hypotheses 1 and 2 — i.e., *Portfolio Width* and *Portfolio Expansion*. Models 3 tests our interaction Hypothesis 3, on the moderating effect of portfolio width on the impact of portfolio expansion. With Model 4, we restrict our analysis to the post-WWII era only, with the goal of gathering empirical evidence on the well-studied post-WWII dynamics of this industry, implying that we can relate our findings to the earlier ones.

The estimates of the control variables largely confirm our expectations. WWII (but not WWI, when motorcycles were much in demand for military purposes) positively affected the failure rates

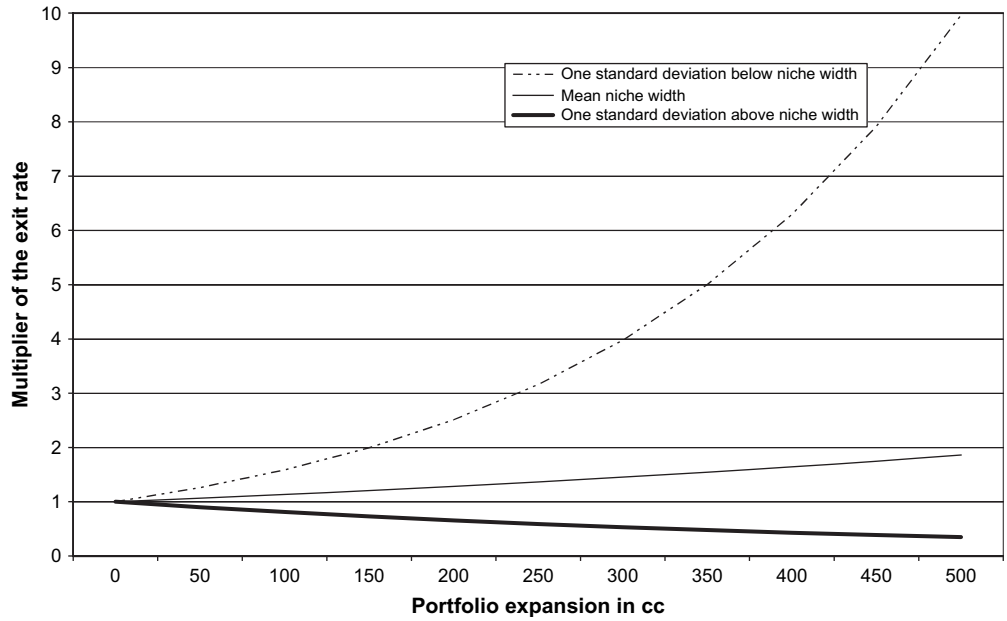

Figure 3. The moderating effect of product portfolio width on portfolio expansion on the exit rates of UK motorcycle producers in 1895–1993

of motorcycle producers. After the 1920s, the overall production level dropped from 147,000 to 58,000 units (1929–1938) and reached the minimum level of 1,600 in 1945. Age dependence is U-shaped in this industry – the turning point is at the age of 35. As can be expected, larger organizations (Size) as well as those located in the Birmingham-Coventry-Wolverhampton triangle (the District) experienced a lower hazard of mortality.[35] In line with ecological findings, Portfolio Overlap significantly increased competition and, thus, organizational exit. The negative estimate of the coefficient related to latent demand for transportation - GDP per Person - suggests that increasing values of this variable improved organizational survival chances of UK producers. In line with previous research, the effect of prior experience inside the same industry – *DeIpso* – or other industries – *DeAlio* – is negatively and significantly related to the exit rate when compared to inexperienced new entrants – *DeNovo*. Position in this industry mattered, as increases in both Distance Above and Distance Below the Market Center are associated with a higher likelihood of exit. Last but not least, evolutionary time (Industry Age) increased exit rates, although, conversely, increasing demand for non-motorcycle vehicles — primarily cars – (Motor Vehicle Production) did not significantly reduce motorcycle producers' survival.

The estimates obtained for the main effects of *Portfolio Width* and *Portfolio Expansion* offer support for our Hypotheses 1 and 2 (Model 2). Adding these variables improves significantly the fit of the model. Broad product portfolio producers enjoy a significantly lower hazard of exit (Hypothesis 1). At the mean value of *Portfolio Width* observed in our sample (see Table 1), failure decreases by approximately 10 per cent [$\exp(-0.0004 \times 210)$]. As predicted by our Hypothesis 2, however, *Portfolio Expansion* positively affects organizational failure. On average, a portfolio expansion, for instance, of 200 cc increases the rate of failure by about 82 per cent [$\exp(.003 \times 200)$]. The negative sign of the *Time Since Last Change* coefficient underscores, however, that the consequences of change are immediate and tend to decrease over time.

The width * expansion interaction

The negative sign of the estimate obtained in Model 3 for the *Portfolio Width * Portfolio Expansion* interaction term supports the argument developed in Hypotheses 3 that broad portfolio producers are better positioned than their narrow portfolio counterparts to withstand

the negative effects of a portfolio expansion. To clarify this interaction, we plotted these effects in Figure 3 using 100 cc, 200 cc and 400 cc expansions to the product range (or portfolio width).

This figure compares the multiplier of the failure rate of a producer experiencing different magnitudes of portfolio expansion, at specific levels of portfolio width — i.e., the mean, one standard deviation above and one standard deviation below. The plots give rise to two considerations. First, the consistently negative slope of the interaction effect, throughout all portfolio width levels, provides support for the hypothesis that the relationship between portfolio expansion and organizational failure turns from positive to negative at increasing levels of portfolio width (i.e., H3). In other words, a specialized narrow portfolio producer (i.e., with the minimum portfolio width in our sample of 0.1 or one standard deviation below the mean) undertaking a portfolio expansion of 250 cc is exposed to a risk of failure three times larger than the baseline effect. More interestingly, and fully in accordance with Hypothesis 3, at high levels of portfolio width, portfolio expansion *negatively* affects the hazard of exit - i.e., positively affects survival — as the multiplier drops below 1 (see the y-axis). The same level of portfolio expansion (250 cc) carried out by a broad portfolio producer (i.e., located one standard deviation above the mean of this variable) reduces its risk of failure of by about 42%. Indeed our data show that producers with a portfolio width larger than 300 cc undertaking a product portfolio expansion exhibited survival benefits, showing that leveraging capacity of broad portfolios overcomes the negative consequences associated with organizational changes.

…at high levels of portfolio width, portfolio expansion positively affects survival [chances].

To further corroborate our reasoning and to interpret our findings in a historical context, building upon earlier work in this industry, we ran the same model for the post-war period from 1946 to 1993 only.[36] The competitive landscape after WWII changed drastically, and the exploitation of scale economies became the most relevant competitive weapon in this industry. As the Japanese manufacturers began to gain market share by offering cheaper products, several British producers opted for refocusing their portfolios towards high-end products. Previous studies in this industry have invoked the superior capacity of Japanese competitors in the late 1960s and early 1970s to leverage their cost advantage as the main cause behind the decline of British motorcycle producers.[37]

From these historical observations, we expect that the relationship portrayed in Figure 3, based on leveraging existing capabilities by broad portfolio producers, to disappear during the post-WWII years. More specifically, we expect that the advantages associated with scope economies will decrease in importance. Indeed, the estimates presented in Model 4 support our speculation: (i) the main effect of portfolio width loses statistical significance; and (ii) portfolio width does not significantly moderate the positive impact of portfolio expansion on the hazard of exit. To push the argument even further, we interpret the statistical significance of the *Size* coefficient as suggesting that scale effects contributed to improve survival chances during the post-WWII years. The problem for the UK industry in this period was that these were all too rare.

Discussion and conclusion

The corner-stone of our reasoning was to confront the pros and cons of organizational change. We have illustrated our logic with the example of product portfolio expansion, which was tested with a rich longitudinal data set containing the histories of nearly 650 British motorcycle

producers over virtually 100 years. As we chose to investigate the effects of organizational change along a technological dimension, we expected the inertial forces of change to be proportional to the distance of the new product(s) from the organizational knowledge base. The results of this study support this argument and reveal how product portfolio width and expansion interact in determining the conditions under which change may increase or decrease organizational failure rates.

This article's contribution is threefold. First, our study contributes to the literature on organizational inertia by shedding light on how firm-specific characteristics moderate the negative consequences of organizational change, at least within our empirical setting. In the last analysis, although our study has been into the correlation of change and organizational failure, it shows that change is not necessarily detrimental for organizations. We thus believe that this article contributes to the long-standing debate on organizational changes and their effects on performance. On the one hand, Hannan and Freeman have argued in their relative inertia theory that organizations must strive towards consistency of replication, as well as high levels of reliability and accountability, to withstand the selection pressures of the environment.[38] Since developing a structure with high fidelity strengthens resistance to change, organizational inertia is the end result of selection. On the other hand, strategic choice theorists have contributed to the debate with their behavioral theory of the firm by elaborating a conception of organizations as adaptive systems.[39] This literature points to the benefits that an organization can reap from implementing change. Empirical studies have investigated this conflicting pair of hypotheses without reaching much consensus. The findings of this study underscore that treating organizational change as a 'firm-independent' category is incorrect, as the negative implications of inertia for organizational performance depend on the nature of the firm under investigation. Firm-specific characteristics have to be taken on board to analyze accurately how change affects performance.

…product portfolio width and expansion interact in determining the conditions under which change may increase or decrease failure rates. … change is not necessarily detrimental for organizations.

Second, it makes explicit the kind of trade-offs that must play a role when considering an organizational change — in this case, a product portfolio expansion. Depending on firm-specific capabilities, organizational change may turn out to be performance-damaging or performance-enhancing. Our empirical evidence suggests that, while portfolio expansions inherently carry an increased risk of mortality, this is moderated according to the breadth of product portfolio. While broad portfolio firms may capitalize on their past investments and differentiated routines, narrow portfolio organizations seem to risk paying a high survival price when initiating the development of their capabilities. (This is clearly illustrated in Figure 3.)

Third, from a managerial standpoint, we provide scientific evidence for a well-established common-sense intuition: firms should grow their pool of capabilities in an incremental rather than in a radical manner. Internal and external constraints mean that each step on the way of building up such a knowledge base is accompanied by the risk of failure. In particular, we show that narrow portfolio organizations launching large-scale expansions are exposed to very high risks of failure, which can be minimized by engaging in incremental portfolio expansions. For those firms having already developed a broad portfolio — i.e., a differentiated set of capabilities — the lessons may be rather different. The larger the pool of routines possessed by a firm, the lower are the marginal costs associated with further expansions. Then the trade-off becomes more favourable towards expansion.

…for firms which already have a substantial portfolio base, further expansion is associated with a lower risk of firm failure than [doing nothing], and 'braver' expansions with lower risks than 'timid' ones.

In terms of managerial insights, the argument of our study into past failures can be developed to provide some pointers as to future success. Figure 4 re-presents the same data as Figure 3 — with the added line to show the 'no-change' option — and gives a more striking illustration of the aggregate implications of expansion for firms at various portfolio widths. On the left hand side of the graph, firms with narrow portfolio widths clearly face high risks of failure when they undertake portfolio expansion, which they can counter to an extent with the tactic of incremental expansion. Doing nothing offers such firms the strategy of lowest risk. But on the right hand side, for firms which already have a substantial portfolio base (in this specific case above 250 cc, just above the average of the industry), the figure indicates two notable features: (i) further expansion is associated with a lower risk of firm failure than not developing the portfolio at all, and (ii) 'braver', more radical, expansions appear to be associated with lower risks than 'timid', minor ones. We interpret this finding as suggesting that the leveraging of existing capabilities may be an indicated strategy for broad portfolio organizations.

Based on the evidence reported in this article, we conclude that while narrow portfolio organizations should take care not to bite off more than they can chew, and only to essay development incrementally in line with what their organizations can realistically accommodate, broader portfolio producers should not be too inhibited in thinking about more radical developments. Needless to say, this logic applies to incumbents, but also to new entrants, who should be careful in entering markets with specialized product portfolios. This logic suggests, for instance, that would-be entrepreneurs shouldn't rush into markets, but rather devote particular attention to pre-production. (In this respect, the size of an organizational portfolio at entry may be crucial. However, analyses not

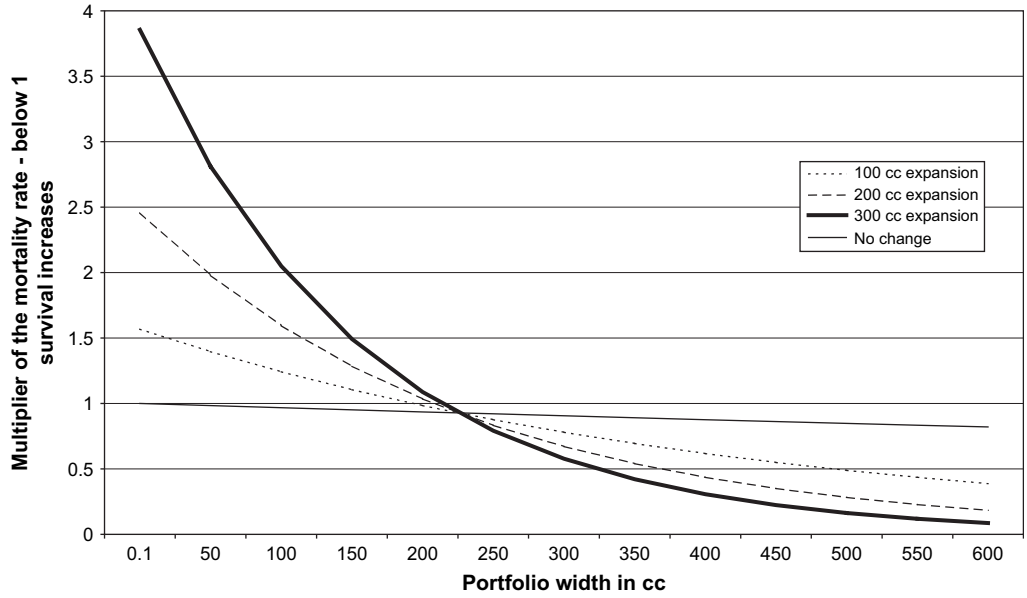

Figure 4. The aggregate impact of product portfolio width at different levels of expansion in the UK motorcycle industry 1895–1993

reported here show that the findings obtained — in particular those of the interaction (H3) — are robust to the addition of this further control.)

Once entered into a market, most firms will be likely to want to move from fragile to robust trading positions, and from lower to higher profitability, and thus it is arguable that many organizations may be in train, as it were, from the left towards the right hand side of the shape illustrated in Figure 4. For the insights provided by this study to offer any useful strategic guidance on this journey, it is clear that managers contemplating expanding their portfolio must have developed a good understanding of where on the narrow-broad continuum their current portfolio lies, to be able to judge what the trade-off between the potential for disruption and for growth is likely to be in their specific case.

Overall, we have put forward the argument that neither ideological pro-change nor pure anti-change logics can provide clear guidance as to the efficacy of organizational change. On the one hand, organizational ecology suggests that the taken-for-granted nature of many change 'hypes' must be viewed with realism.[40] On the other hand, a pro-inertia argument may benefit from being cross-fertilized with insights from strategic management. This implies that strategy is about finding out what the development alternatives are, which, under specific circumstances, may well include the benchmark inertia case of staying where you are.

…managers contemplating expanding their portfolio must understand what the trade-off between the potential for disruption and for growth is likely to be in their specific case.

Acknowledgements

We gratefully acknowledge the valuable comments of Charles Baden-Fuller, his copy-editor Jonathon Morgan, and to two anonymous reviewers. Of course, the usual disclaimer applies.

References

1. For a recent interesting contribution see, for instance V. Hope Hailey and J. Balogun, Devising context sensitive approaches to change: the example of Glaxo Wellcome, *Long Range Planning* **35**, 153—178 (2002).
2. For a review, see G. R. Carroll and M. T. Hannan, *The Demography of Organizations and Industries*, Princeton University Press, Princeton (2000).
3. For an example of a similar attempt, see H. W. Volberda, C. Baden-Fuller and F. A. J. van den Bosch, Mastering strategic renewal: mobilising renewal journeys in multi-unit firms, *Long Range Planning* **34**, 159—178 (2001). Our approach is different in explicitly integrating strategic management insights into a methodological framework that is similar to organizational ecology.
4. See, for example C. K. Prahalad and G. Hamel, The core competencies of the corporation, *Harvard Business Review* 79—83 (1990); W. P. Barnett and J. H. Freeman, Too much of a good thing?: product proliferation and organizational failure, *Organization Science* **11**, 539—558 (2001); P. K. Chaney, T. M. Devinney and R. S. Winter, The impact of new product introductions on the market value of firms, *Journal of Business* **4**, 573—610 (1991).
5. See, for example, R. Henderson, Underinvestment and incompetence as responses to radical innovation: evidence from the photolithographic alignment equipment industry, *Rand Journal of Economics* **24**, 248—270 (1993); R. M. Henderson and K. B. Clark, Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms, *Administrative Science Quarterly* **35**, 9—30 (1990); M. Iansiti, Managing technological transitions: empirical evidence from the semiconductor industry, *Organization Science* **10**, 169—185 (2000).
6. M. W. Meyer and V. Gupta, The performance paradox, in L. L. Cummings and B. M. Staw (eds.), *Research in Organizational Behavior* **16**, JAI Press, Greenwich CT, 309—369 (1994).

7. Differentiation studies abound, dealing with intra-industry competition among dissimilar product varieties. For an overview, see B. C. Eaton and R. G. Lipsey, Product differentiation, in R. Schmalensee and R. D. Willig (eds.), *Handbook of Industrial Organization*, North-Holland, Amsterdam, 723–770 (1989).
8. E. Tragatsch, *The New Illustrated Encyclopedia of Motorcycles*, Quantum Publishing, Edison, New Jersey (2000).
9. M. Corso, M. Muffatto and R. Verganti, Reusability and multi-product innovation policies: a comparison of approaches in the automotive, motorcycle, and earthmoving machinery industries, *Robotics and Computer-Integrated Manufacturing* **15**, 155–165 (1999).
10. M. Tripsas and G. Gavetti, Capabilities, cognition, and inertia: evidence from digital imaging, *Strategic Management Journal* **21**, 1147–1161 (2000).
11. J. M. Perloff and S. C. Salop, Equilibrium with product differentiation, *Review of Economic Studies* **52**, 107–120 (1985); K. Moorthy, Market segmentation, self-selection, and product line design, *Marketing Science* **3**, 288–307 (1984).
12. R. P. Bagozzi, *Principles of Marketing Management*, Science Research Association, Chicago (1986).
13. Organizational ecology has produced dozens of organizational exit studies, many of which confirming the benefits of organizational size and scope. See F. C. Wezel and A. van Witteloostuijn, Scale and Scope Economies in the U.K. Motorcycle Industry, 1889–1993, in J. A. C. Baum, S. Dobrev and A. van Witteloostuijn (eds.), Ecology and Strategy, *Advances in Strategic Management*, JAI Press, Greenwich CT, 23 (2006); Another example is S. D. Dobrev, T.-Y Kim and G. R. Carroll, Shifting gears, shifting niches: organizational inertia and change in the evolution of the U.S. automobile industry, 1885–1981, *Organization Science* **14**, 264–282 (2003); Two recent studies by C. Boone, G. R. Carroll and A. van Witteloostuijn apply organizational ecology logic to traditional strategic management performance yardsticks (i.e., financial profitability and organizational growth): Resource distributions and market partitioning: Dutch daily newspapers, 1968 to 1994, *American Sociological Review* **67**, 408–431 (2002); Size, differentiation and the growth and profitability of Dutch daily newspapers, *Industrial and Corporate Change,* **13**, 117–148 (2004).
14. N. Venkatraman and M. Subramaniam, Theorizing the future of strategy: questions for shaping strategy research in the knowledge economy. *The Handbook of Strategy and Management*, Sage Publications, London, (2002) 461–474. Note that the present article focuses on within-industry scope economies, as a consequence of offering a series of product varieties, rather than across-industry scope economies, as studied in the literatures on diversification and multi-market competition.
15. Modern organizational ecology theory emphasizes the key role of organizational identity. On this, see G. R. Carroll, M .T. Hannan (op. cit. at Ref 2).
16. J. G. March, Exploration and exploitation in organizational learning, *Organization Science* **2**, 71–87 (1991).
17. C. Baden-Fuller and J. Stopford, *Rejuvenating the Mature Business*, Harvard Business School Press (1994).
18. See the reference to the classic Prahalad and Hamel paper at Ref. 4 R. A. Burgelman, Cambridge MA develops a similar argument by applying an ecological logic to issues of organizational learning in a series of case studies of Intel: Intraorganizational ecology of strategy making and organizational adaptation: theory and field research, *Organization Science* **2**, 239–262 (1991); Fading memories: a process theory of strategic business exit in dynamic environments, *Administrative Science Quarterly* **39**, 24–56 (1994); Strategy as vector and the inertia of coevolutionary lock-in, *Administrative Science Quarterly* **47**, 325–357 (2002).
19. For a detailed introduction of the data set, refer to F. C. Wezel and A. van Witteloostuijn, The ecology of niche-width strategies: generalists, polymorphists and specialists in the United Kingdom motorcycle industry from 1895 to 1993, *Research Memorandum*, University of Tilburg, Tilburg (2003).
20. The main source of information is P. Collins, *British Motorcycles Since 1900*, Ian Allen Transport Library, Surrey, (1998) which includes the date of birth and disbanding of each firm in the UK. The information was refined by consulting E. Tragatsch, *The Complete Illustrated Encyclopedia of World's Motorcycles*, Quantum Publishing, London (1977); as well as E. Tragatsch (2000) (op. cit. Ref 8); Data at the product level were obtained from W. Hume, *The Register of Machines of the VMCC* (third edition), The Vintage Motor Cycle Club, London (1991); In order to test the reliability of the data, we checked the magazines of the period including Motor Age (from 1899), Cycle Trade Journal (from 1897) and Motor (from 1903).
21. Boston Consulting Group, *Strategic Alternatives for the British Motorcycle Industry*, Her Majesty Stationery Office, London (1975); R. Pascale, Perspectives on strategy: the real story behind Honda's success, *California Management Review* 47–73 (1984).
22. H Mintzberg, Learning 1, Planning 0, *California Management Review* 92–93 (1996).

23. S. D. Dobrev, T.-Y. Kim and M. T. Hannan, Dynamics of niche width and resource partitioning, *American Journal of Sociology* **106**, 1299–1337 (2001) Following this study, we assumed 'unknown events' – about 8 per cent of our population - to be governed by processes very similar to those related to exits. Therefore, the outcome event of interest in our analyses is *'disbanding/exit to another industry, defined to include events of unknown type'* (p 1311).
24. J. M. Podolny, T. Stuart and M. T. Hannan, Networks, knowledge, and niches: competition in the worldwide semiconductor industry, 1984–1991, *American Journal of Sociology* **102**, 659–689 (1996); S. D. Dobrev, T.-Y. Kim, M. T. Hannan (2001: op. cit. at Ref 23) S.D. Dobrev, T.-Y.Kim, G.R. Carroll (2003: op. cit. at Ref 12).
25. M. Muffatto and R. Panizzolo, Innovation and product development strategies in the Italian motorcycle industry, *Journal of Product Innovation Management* **13**, 348–361 (1996); for an example in a similar industry, see S. D. Dobrev, T.-Y. Kim, M. T. Hannan (2001 op. cit. at Ref 23).
26. G. R. Carroll, L. S. Bigelow, M.-D. Seidel and L. B. Tsai, The fates of de novo and de alio producers in the American automobile industry, 1885–1982, *Strategic Management Journal* **17**, 117–138 (1996).
27. Due to the century-long time window of our data set, we were unable to collect conventional size measures, although the number of plants is a sensible surrogate measure. For instance, two studies by Mata and Portugal reveal a strong positive and statistically significant correlation between number of plants and standard size measures (e.g., number of employees): J. Mata and P. Portugal, Life duration of new firms, *Journal of Industrial Economics* **42**, 227–246 (1994); J. Mata and P. Portugal, The survival of new domestic and foreign-owned firms, *Strategic Management Journal* **23**, 323–343 (2000).
28. T. Petersen, Time aggregation bias in continuous-time hazard-rate models, in P. Marsden (ed.), *Sociological Methodology*, Blackwell, Oxford, 290–293 (1991).
29. W. P. Barnett and D. McKendrick, The organizational evolution of global technological competition, *Research Paper # 1682*, Stanford University, Graduate School of Business (2001).
30. A. Henderson, Firm strategy and age dependence: a contingent view of the liability of newness, adolescence and obsolescence, *Administrative Science Quarterly* **44**, 281–314 (1999).
31. A. Maddison, *Dynamic Forces in Capitalist Development*, Oxford University Press, New York (1991).
32. B. R. Mitchell, *International Historical Statistics: Europe 1750–1993*, Stockton Press, New York (1998).
33. P. D. Allison, *Event History Analysis: Regression for Longitudinal Event Data*, Beverly Hills, California, Sage (1984); N. B. Tuma and M. T. Hannan, *Social Dynamics: Models and Methods*, Academic Press, New York (1984).
34. In general, different time functions and different covariates can be used to model the hazard rate of each organization. Because of the discrete (annual) nature of our data set, we employed discrete event-history analysis. A discrete time hazard rate is defined as

    $$P_{it} = \Pr(T_i = t | T_i \geq t, X_{it})$$

    where T is the discrete random variable measuring the uncensored date of survival and P_{it} is the probability that firm i at time t will still be in existence, given that it did not fail in any previous time interval. We employed a complementary log-log specification to model this process. Under the assumption that events are generated by a Cox's proportional hazard rate model, we have

    $$\log[\log(1 - P_{it})] = \alpha_t + \delta' \mathrm{x}_{it},$$

    where α_t is an unspecified function of time, x_{it} is the vector that includes all covariates and controls, and δ is the vector of coefficients.
35. S. Koerner, The British motor-cycle industry during the 1930s, *The Journal of Transport History* **17**, 56–76 (1995).
36. Ideally, we would have liked to run the analyses for the period 1970–1993. However, the low number of producers operating in this period, and thus the marginal number of observations, prevented us from obtaining any statistically meaningful finding.
37. The Boston Consulting Group's report (op. cit. Ref 21) concludes (1975: XV), '*Long term commercial success in fact depend[ed] on achieving sales volumes equal to those of the Japanese employing equally sophisticated low cost production methods.*' To reach this goal, British motorcycle producers needed to invest more resources in technological development. As the report suggests, '*sustained technological advances require a major, continuing commitment to ensure technological leadership and to guarantee that its advances remain proprietary. Only a high volume producer can justify this effort …The disastrous commercial performance of*

the British manufacturers […] is the final result of their failure to respond effectively to the strategic implications of the economic relationship between volume and costs in the motorcycle industry.' (1975: XI)
38. M. T. Hannan and J. Freeman, Structural inertia and organizational change, *American Sociological Review* **49**, 149–164 (1984).
39. J. Child, Organizational structure, environment, and performance: The role of strategic choice, *Sociology* **6**, 1–22 (1972). Their flexibility-type argument, whilst recognizing sources of resistance and risk, dominates the literature, as is clear from any textbook in strategic management (see also the Introduction).
40. E. Abrahamson, The emergence and prevalence of employee management rhetoric: The effects of long waves, labor unions, and turnover, 1875 to 1992, *Academy of Management Journal* **40**, 491–533 (1997); A. M. Sorge and A. van Witteloostuijn, The (non)sense of organizational change: an *essai* about universal management hypes, sick consultancy metaphors and healthy organization theories, *Organization Studies* **24**, 1205–1231 (2004).

Biographies

Filippo Carlo Wezel is Associate Professor of Organization Theory at Tilburg University He received his PhD in Management from the University of Bologna. His current research is at the interface of organizational ecology and strategic management, with a focus on long-term processes of industry evolution and organizational performance. His work has been recently published in *Organization Science*, *Organization Studies* and *Advances in Strategic Management*. *University of Tilburg, Department of Organization and Strategy, P.O. Box 90153, 5000 LE Tilburg, the Netherlands, tel.: +31 (0) 13 4663260, fax: +31 (0) 13 4668354, e-mail: f.c.wezel@uvt.nl.*

Arjen van Witteloostuijn is Professor of International Economics and Business at the University of Groningen and Professor of Strategy at the University of Durham. He received his PhD in Economics from the University of Maastricht. He is member of the Editorial Board of the *Academy of Management Journal*, *Industrial and Corporate Change*, *Organization Studies* and *Strategic Organization*. He has published widely in such journals as the *Academy of Management Executive*, *Academy of Management Review*, *Academy of Management Journal*, *American Sociological Review*, *Economica*, *Management Science* and *Strategic Management Journal*. His current research ranges from international trade theory and industrial organization to top management team leadership and personality psychology. *University of Groningen, Faculty of Economics, Department of International Economics and Business, P.O. Box 616, 9700 AV Groningen, the Netherlands, tel.: +31 (0) 50 363 7193, fax: +31 (0) 363 7337, e-mail: a.van.witteloostuijn@rug.nl.*