Organizational Resources and Learning from Ambiguous Performance Feedback

Thorsten Grohsjean
Munich School of Management, University of Munich, 80539 Munich, Germany,
t.grohsjean@lmu.de

Tobias Kretschmer
Munich School of Management, University of Munich, 80539 Munich, Germany,
t.kretschmer@lmu.de

Nils Stieglitz
Management Department, Frankfurt School of Finance & Management, 60314 Frankfurt, Germany,
n.stieglitz@fs.de

Abstract

Because performance feedback is often ambiguous about the causes of success and failure, research on organizational learning claims that ambiguous feedback rewards slower adaptation, allowing for better identification and development of superior actions. However, slower adaptation might not always be beneficial or possible. Specifically, the endowment with different types of resources influences when and how firms respond to performance feedback. We examine how organizational resources influence the potential benefits as well as the ability of firms to engage in slower adaptation. We propose that product-market resources diminish ambiguity about market responses, reducing the value of slower adaptation and thus making firms more responsive to performance feedback. Conversely, technological resources improve operational reliability but do not reduce feedback ambiguity. Rather, they require slower adaptation to prevent changing away from potentially superior actions. Financial resources buffer organizations and thereby enable slower adaptation, reducing responsiveness to performance feedback. Finally, industry experience helps organizations interpret feedback and decrease ambiguity, allowing for more rapid adaptation. Using a panel of video game publishers over a period of 26 years, we find support for our hypotheses. Our results contribute to research on organizational learning from performance feedback and to the literature on the role of causal ambiguity in organizational decision-making.

Keywords: performance feedback, causal ambiguity, resources, organizational change,

Introduction

A large body of research suggests that negative performance feedback indicates that the firm's current actions do not work and may thus trigger strategic and organizational change (e.g. Greve 1998; Greve 2003; see Shinkle 2012 for a comprehensive survey). However, the evidence provided by performance feedback is often highly ambiguous and open to multiple interpretations about the causes of success and failure (Joseph and Gaba 2014; March and Olsen 1975; Mosakowski 1997). Negative feedback might prompt firms to change away from actions that are, in fact, superior (Levinthal and March 1993). For example, in 1993 Apple launched the Newton PDA, a precursor of modern smartphones, but quickly stopped developing it further after disappointing initial sales. However, sales of PDAs exploded when startup company Palm launched the Pilot PDA in 1996. In fact, before founding Palm, founder Jeff Hawkins was involved in the development of the Zoomer, another failed PDA. Unlike Apple, Hawkins persisted and turned Palm into a commercially successful innovator. Accordingly, the organizational learning literature has pointed out that adapting slowly as a response to ambiguous feedback can be beneficial, arguing that persistence with apparently poor actions might result in long-term benefits (March 1991; Levinthal and March 1993; Puranam et al. 2015).

Interpreting performance feedback is difficult because there might be ambiguity about goals and actions. The behavioral theory of the firm stresses that performance is evaluated relative to organizational goals or aspirations. An organization often formulates multiple, interdependent aspirations, thereby introducing ambiguity about what constitutes good performance (Joseph and Gaba 2014; Kacperczyk et al. 2014). However, even in the absence of goal ambiguity, the organization faces the problem of establishing the causes of success and failure. Performance signals often provide only ambiguous feedback about to why (not) actions led to successful outcomes because performance depends on a complex web of many environmental variables such as demand conditions, competitor actions, regulatory interventions, etc. beyond the immediate control and often observability of the organization (March and Olsen 1975; Mosakowski 1997). For example, reduced performance could be caused by temporary shifts

in demand or an unexpected fleeting success of a competitor's product rather than a firm's own inadequate actions. Instead of changing then, a firm could be better off by not responding to this feedback and persisting with current actions.

While prior work has forcefully argued that slower adaptation in highly ambiguous settings can be beneficial, only few studies have considered how the value of and potential to engage in slower adaptation is influenced by organizational characteristics. Mosakowski (1997) proposes that causal understanding is increased and ambiguity in feedback conditions reduced as firms become older and more experienced. Denrell and March (2001) argue that slower adaptation is a costly strategy, suggesting that the financial prowess of organizations might shape how they can respond to negative performance feedback. While these contributions point to an important role for organizational resources, they do not consider how resources influence the responsiveness of organizations to performance feedback and thus comprise an important reason why organizations respond differently to performance feedback. We address this gap in our understanding of adaptive processes in organizations.

Our main line of argument is that organizational resources influence both the potential benefits as well as the ability of firms to engage in slower adaptation. We propose that product-market resources like established brands increase predictability in the business environment and thereby reduce causal ambiguity about environmental variables. They improve the clarity of performance feedback and reduce the value of slower adaptation. Organizations with larger stocks of product-market resources are therefore more responsive to performance feedback. In contrast, technological resources improve operational reliability, but do not reduce ambiguity about the influence of environmental variables. Rather, firms with large stocks of technological resources face a higher risk of changing away from superior actions and potentially benefit more from slower adaptation. Hence, larger stocks of technological resources make firms less responsive to performance feedback. Financial resources shield organizations from internal and external pressures and can thereby enable slower adaptation so that firms with larger stocks of financial resources become less responsive to performance feedback. Finally, as firms gather experience in a particular setting, they gain a better causal understanding and learn about how external variables affect

performance. Experience reduces causal ambiguity and enables more rapid adaptation to performance feedback. Hence, more experienced firms in an industry respond more strongly to performance feedback than inexperienced ones.

We empirically examine the effects of the different organizational resources on the link between performance feedback and organizational change using a panel of video game publishers for the period 1987-2012. This single-industry setting is a strong test bed for our theoretical arguments because market success is hard to predict in video games and the industry is subject to continuous changes in complementary technologies, competition, and demand conditions. We measure organizational change as changes in the yearly genre composition of a firm's games portfolio, which is useful because it is a key choice variable of game publishers and because game portfolios depreciate rapidly so they have to be constantly adjusted following feedback on the success of the previous season's games. We also control for the direct effects of organizational resources and a series of control variables.

The paper makes three contributions. First, we contribute to the literature on performance feedback. While prior work explained variations in the reaction to performance feedback with different kinds and levels of aspirations, we suggest that resources play an important role in explaining why organizations react differently to performance feedback. Our key insight is that larger stocks of technological and financial resources make firms less responsive to feedback, while product-market resources and industry experience make them more responsive. Hence, incorporating resources into standard models of performance feedback might lead to sharper predictions and inform future empirical work. Second, we expand research on organizational learning that emphasized the benefits of slower adaptation by theorizing how resources shape both the value and the ability of slower adaptation. This focus on organizational differences contrasts with prior contributions in the organizational learning literature that stress how the external task environment affects the benefits of slower adaptation. Finally, our results speak to research on causal ambiguity and its consequences for organizational routines and performance. We complement current literature by theorizing how ambiguity about the complex causes of success and failure affects organizational decision-making.

Theory and Hypotheses

Performance Feedback and the Speed of Adaptation

Performance feedback has long been recognized as an important mechanism for organizational learning (Cyert and March 1963). The central idea is that firms learn from experience by repeating actions that lead to performance above organizational goals or aspirations. Conversely, negative feedback is indicative of inferior actions suggesting that firms might do better if they change things around. Empirical studies provide strong evidence for the relationship between performance feedback and organizational change (e.g. Greve 2003). Subsequent work has fleshed out the basic model by refining the formation and consequences of organizational aspirations (see Shinkle 2012 for a comperhensive survey).

Recent work studies how organizations handle and attend to multiple performance aspirations (Blettner et al. 2014; Giachetti and Lampel 2010; Kacperczyk et al. 2014). The presence of multiple organizational aspirations reduces the interpretative clarity of feedback, as it is no longer clear whether performance is above aspirations or not. Aspiration ambiguity therefore dampens the responsiveness to feedback (Joseph and Gaba 2014). In contrast, we stress the ambiguity about the causality of events. Even if an organization can unambiguously establish that performance is below aspirations, it has to interpret the causes for failure (Denrell and March 2001; March and Olsen 1975; Powell et al. 2006). Take the example of Sony's failed attempt to introduce a successor to the Compact Cassette in 1992. Its failure may have been due to the inadequate design of its MiniDisc, a lack of perceived need by consumers to replace their cassette systems, or the fact that consumers had no budget to purchase to both a Compact Disc player and a MiniDisc player in quick succession. While the first explanation is a firm-specific one suggesting a faulty design, the other two are market-based explanations suggesting that the design may have been right but the timing was premature. Organizational decision-making is troubled by such ambiguity about the causal structure because organizational performance depends on organizational actions contingent on complex environmental variables beyond the immediate control of the firm

(Mosakowski 1997). Causal ambiguity in performance feedback thus highlights decision-makers' difficulties of discerning the causes of firm success or failure.

Negative feedback might then be misleading about the true value of organizational actions in ambiguous environments. An organization that responds to negative feedback by rapidly changing its current actions may give up superior actions (Denrell and March 2001; Levinthal and March 1993). Rapid adaptation also undermines the potential to accumulate stocks of valuable resources (Mosakowski 1997). Finally, reacting to negative feedback might ensnare organizations in a failure trap (Levinthal and March 1993) where change leading to deteriorating performance triggers even more change, creating a vicious circle of unsuccessful changes. The organizational learning literature has therefore proposed that organizations deal with ambiguity in feedback conditions by engaging in slower adaptation – persisting with actions having poor early outcomes (Billinger et al. 2013; Denrell and March 2001; Mosakowski 1997). Hence, organizations become less responsive to feedback and persevere with actions even if initial feedback is negative.

Slower adaptation also has pronounced disadvantages; it puts organizations at risk of low performance and possible bankruptcy. First, the action preceding inferior short-term performance could indeed be inferior. Second, with strong selection pressures, slower adaptation could be undermined because an organization might be bankrupt before reaping the benefits of uncovering actions that are superior only in the long-term (Levinthal and Posen 2007; March 1991). Third, in environments experiencing radical change, slower adaptation might lead firms into a competence trap as they persist with an inferior action (Levinthal and March 1993). Thus, as Denrell and March (2001, p. 527) argued, "extended periods of experimentation with apparently poor alternatives is usually a very costly strategy".

Given the arguments above, we study how organizational resources may shift the balance of advantages and disadvantages of slow adaptation and consequently generate heterogeneous responses to performance feedback. The argument by Denrell and March (2001) implies that financial resources can help organizations sustain slower adaptation in response to negative performance. Organizations with different stocks of financial resources may therefore respond to performance feedback differently.

Mosakowski (1997) proposed that the environment is more ambiguous for less experienced decision-makers, so that firms with more experience have a better causal understanding of their task environment. Building on these suggestions, we develop a comprehensive approach to understand how resources shape the link between feedback and organizational change.

In contrast to our focus on feedback and change, most prior work on organizational change has investigated the direct impact of resource stocks on the ability and willingness of organizations to change. Kraatz and Zajac (2001) showed how greater stocks of historically valuable resource endowments inhibit change processes as a response to disruptive environmental change. They also found that this resource-driven inertia tends to have benign effects on performance. Following the behavioral theory of the firm, a large body of literature has also examined how stocks of slack resources – resources in excess of current operational demands – affect change and adaptation. Slack resources stimulate innovation and change by promoting experimentation with novel alternatives (e.g. Bourgeois 1981; Lecuona and Reitzig 2014). However, many studies found the opposite and argued that greater stocks of slack resources insulate the firm from performance pressures, which undermines adaptation (Bromiley 1991; Wiseman and Bromiley 1996). Therefore, both too little and too much slack resources may reduce organizational change and innovation (Kim and Bettis 2014). Voss et al. (2008) extend this argument by considering how different types of slack affect adaptation. They found that operational and human resource slack promotes exploitation and inertia, while financial and relational slack triggers adaptation if the perceived environmental threat is high. However, this literature is largely silent on how organizational resources shape the value and ability of slower adaptation and, hence, the organizational responsiveness to performance feedback. We therefore control for the direct effect of organizational resources on change and adaptation in our empirical analysis, but concentrate our theoretical argument on understanding how they moderate organizational responsiveness to performance feedback.

To conceptualize organizational resources, we broadly define resources as organizational factors enabling organizational actions that transform input factors into output products and services (Kraatz and Zajac 2001; Madhok and Tallman 1998). Prior work classifies resources into technological and product-

market resources (Danneels 2002; Nerkar and Roberts 2004; Voss et al. 2008). Technological resources include manufacturing plants, technology development, manufacturing and engineering know-how, etc., while product-based resources encompasses company reputation, brands, customer relations, etc. We also consider firm-wide resources such as financial resources and industry experience. Below, we theorize how these resources affect organizational responsiveness and adaptation to performance feedback.

Performance Feedback and Organizational Change

As outlined above, performance feedback is an important source for learning and adaptation. Positive performance feedback indicates that past actions led to success and should be replicated. Conversely, failure to meet aspirations provides a signal, albeit ambiguous, of the inadequacy of prior actions. Hence, failure triggers problemistic search (Cyert and March 1963) and the organization changes to and experiments with novel actions to close the attainment gap. Past empirical research has provided broad support for the proposed negative relationship between performance feedback and organizational change (Shinkle 2012). Hence, our baseline hypothesis is:

HYPOTHESIS 1 (H1). Organizations receiving more negative performance feedback engage in more organizational change.

Product-Market Resources and Adaptation to Performance Feedback

Organizations accumulate stocks of resources that foster and stabilize relations with costumers. Costumer behavior is a major determinant of firm success and performance feedback. Product-market resources therefore make costumer behavior more predictable, reducing causal ambiguity and improving the clarity of performance feedback.

Strong brands improve the predictability of future sales (Dekimpe and Hanssens 1999; Sirdeshmukh et al. 2002) and reduce the variability of performance (Bharadwaj et al. 2011; Rego et al. 2009). Brand extensions have a similar effect on the introduction of new products (Danneels 2002; Nerkar and Roberts 2004). For example, introducing a brand extension in the motion picture industry (such as Star Wars Episode VIII) not only generates higher average revenues, but critical to our argument it reduces

ambiguity by allowing for more accurate predictions and lower performance variations (Hennig-Thurau et al. 2009). Similarly, corporate reputation (Roberts and Dowling 2002) and status (Sauder et al. 2012) reduce variability and sustain organizational performance. Thus, product-market resources reduce causal ambiguity in performance feedback. For firms with large stocks of such resources, negative feedback is then a clearer and stronger signal that current organizational actions are inferior.

Therefore, differences in the stock of product-market resources across firms lead to variations in the perceived ambiguity about the external environment. For firms with greater resource stocks, the environment appears less ambiguous. They perceive negative feedback as a stronger call for organizational change and for more rapid adaptation. At the same time, the factual reduction of causal ambiguity also reduces the value of slower learning. We therefore expect firms with larger stocks of product-based resources to be more responsive to negative performance feedback:

HYPOTHESIS 2 (H2). *Larger stocks of product-market resources positively moderate the relationship between performance feedback and organizational change.*

Technological Resources and Adaptation to Performance Feedback

Technological resources give firms the ability to design and manufacture products (Danneels 2002). Their accumulation reduces internal variation and uncertainty (Kamps and Pólos 1999) and leads to greater organizational reliability and improved productivity of organizational actions (Argote and Epple 1990). However, unlike product-market resources, they contribute little to the reduction of causal ambiguity from market responses. Thus, differences in stocks of technological resources will have less of an effect on perceived ambiguity about the environment than product-market resources.

Rather, greater stocks of technological resources increase the potential benefits of slower adaptation, especially if they are specific to current organizational actions (Mishina et al. 2004). Changing away from existing technological resources carries the risk of abandoning potentially superior actions. Specialized technological resources like manufacturing plants and know-how, engineering expertise, or technological capabilities may erode when organizations stop (re-)investing in them and shed or re-allocate associated personnel (Dierickx and Cool 1989). Organizational change also disrupts ongoing experiential learning

processes. In their pursuit of novelty, firms might fail to develop potentially valuable competencies if they respond rapidly to ambiguous feedback (Levinthal and March 1993).

In sum, organizations with greater stocks of technological resources may benefit more from slower adaptation. In contrast, firms with less technological resources do not face the same danger of changing away from potentially superior resources. We therefore expect organizations with larger stocks of technological resources to engage in slower adaptation and to be less responsive to performance feedback.

HYPOTHESIS 3 (H3). *Larger stocks of technological resources negatively moderate the relationship between performance feedback and organizational change.*

While technological resources require slower adaptation in ambiguous environments to avoid abandoning promising actions, we argue that financial resources enable slower adaptation and create stability advantages for a firm. First, slow adaptation consumes financial resources because a firm has to accept temporary performance shortfalls. Second, and related, slower adaptation often puts firms at a temporary disadvantage vis-à-vis more responsive competitors in competitive environments (Levinthal and Posen 2007; March 1991; Mosakowski 1997). This creates managerial and organizational pressures to react and abandon the current strategy. Financial resources can alleviate these pressures by providing a buffer for managers and by promoting a long-term orientation (Bourgeois 1981; Kim and Bettis 2014). Finally, larger stocks of financial resources may also support persistence by hedging against the risk of slower adaptation. If an alternative turns out to be inferior after a protracted learning process, the firm still has the financial capacity to change – there is an option value in inertia because adaptation can still occur at a later stage. For the same level of performance feedback, firms with more financial resources are less likely to change because they can resist pressures to act quickly. Financial resources therefore offer stability advantages for organizational learning and promote inertia rather than rapid respones. All this implies that greater stocks of financial resources increase the ability to engage in slower adaptation and make firms less responsive to performance feedback. Hence, we propose:

HYPOTHESIS 4 (H4). *Larger stocks of financial resources negatively moderate the relationship between performance feedback and organizational change.*

Finally, some organizations may have a deeper understanding of the performance-relevant causal structure of the industry environment than others, which helps them interpret the signals they receive through performance feedback more precisely. Such organizations are likely to be more responsive to performance feedback, because they can better interpret feedback signals. In other words, the ability to read a signal precisely reduces the value of slower adaptation.

A main determinant of causal understanding is the experience with a given task environment (Gavetti and Levinthal 2000; Powell et al. 2006). More experience reflects past learning about the task environment. Organizations differ in their experience with a given task environment and more experienced firms tend to have a better understanding of the causal structure that leads to success or failure in a particular industry, provided the industry has not undergone radical changes that invalidate prior experience. Experience with a specific task environment captures past learning better than organizational age; a characteristic the organizational ecology literature associates with increased inertia (Hannan and Freeman 1984). What matters for ambiguity reduction in a particular task environment is the specific experience there, not accumulated experience elsewhere as captured by organizational age. Put simply, having received many signals in a specific market helps firms interpret future signals more accurately (Mosakowski 1997). Hence, firms with more industry experience face less ambiguity and derive fewer benefits from slower adaptation. They are more responsive to performance feedback:

HYPOTHESIS 5 (H5). *Larger stocks of industry experience positively moderate the relationship between performance feedback and organizational change.*

DATA AND METHODS

Research Setting

The video game industry consists of three types of players: Platform providers, game publishers, and game developers. Platform providers (such as Nintendo or Sony) design and manufacture video game hardware. Publishers (such as Electronic Arts or Activision) manage relationships with software retailers

and platform providers, and package and market games to consumers. They also fund and control the game development process. Game developers (such as Rockstar Toronto or Daedalic Entertainment) create and code the video games. Developers may be publisher-owned in-house studios (like Rockstar Toronto) or independent companies (like Daedalic Entertainment). Developers make most decisions regarding the development of a particular game, while publishers often initiate game development and make portfolio decisions. They bear most of the financial risk and monitor that development projects remain on time and budget whilst meeting expected product quality (Chandler 2009).

We focus on game publishers and their portfolio decisions. Publishing a game involves large investments through marketing and development costs. Entertainment analysts M2 Research put development costs for single-platform projects at an average of $10 million (Crossley 2010). As only some of the games will eventually break even, publishers actively manage their product portfolios to spread the risk: "We believe the diversification of our product mix will reduce our operating risks and increase our revenue" (TakeTwo 2008).

The videogame industry is a continuously changing environment, with changes in technology, competition, and demand. A constant stream of product releases is necessary to sustain a company because the life cycle of a video game is short and most revenues are made within the first months or even weeks after the introduction. For example, in 2011 "Modern Warfare 3", part of the Call of Duty series, made $775 million in its first five days and only another $225 million in in the two weeks following (Guardian 2012). At the same time, predicting consumer reception and product success is difficult, making performance feedback highly ambiguous. For example point and click adventures were very popular in the 1990s and again in the 2010s but highly unattractive in the 2000s. Predicting the success of different genres is thus very challenging: "With target audiences and video game consumption constantly evolving, it is essential for a publisher to correctly anticipate market trends and to choose the proper format for a game. This strategic choice is crucial, given the sums invested." (Ubisoft 2009).

Data and Sample

We merge two databases to construct our dataset: MobyGames and Osiris. MobyGames is the world's largest and most detailed video game documentation project, containing comprehensive information on over 63,000 games published since 1972. All information is entered by users of the site on a voluntary basis. To ensure accuracy, MobyGames has a strict set of coding instructions and requires all entries to be peer-reviewed prior to publication. For all games, we retrieved data on genre, release date, internal franchise, publisher and developer. We use MobyGames to construct our variables *organizational change*, *internal franchises, internal developer resources*, *industry experience*, *portfolio size*, *portfolio concentration* and *industry size* (all variables are defined below).

This data is matched with the Osiris database by Bureau van Dijk, which provides company balance sheets and income statements for a large range of firms. As well as descriptive information and financials, Osiris has information on ownership structures and M&A activities, helping us match information on product releases with financial data. The level of detail depends on how demanding the accounting standards of a country are and which firms report. Hence, our sample is biased towards countries with more demanding accounting standards and more transparent firms. 50% of the firms in our sample are based in Europe, 20% in the United States and 30% in Japan. Osiris gives information on active and dissolved firms, limiting survivor bias. In fact, 8 out of 67 publishers went bankrupt during our observation period. We use Osiris for our measures on performance feedback, i.e. *historical comparison and social comparison*, and the variables *financial resources* and *firm size*. Combining datasets yields an unbalanced panel with 526 publisher-year observations by 67 publishers from 1987 to 2012.

Measures

Organizational Change. As we are interested in the link between performance feedback and organizational change, our dependent variable must capture the scope of change in organizational actions in a meaningful way. In our empirical context, the release of a video game constitutes an important organizational action as a game release involves substantial resource commitments in terms of

development, marketing, and managerial costs. Thus, the scope of change in organizational actions of video game publishers is best described by the change in the pattern of game releases over time where we describe the pattern of game releases by looking at the genres games are classified in. A genre is the most appropriate market segment classification in the video game industry as it represents a distinct product category in terms of story, game design, level design, art and sound. Each genre requires a new set of skills and capabilities of developer and publisher as they appeal to distinct consumer groups with different preferences. This makes it difficult for the publisher to predict success in a new genre. We use MobyGames' classification into eight different genres: action, adventure, role playing game, strategy, sports, simulation, racing and educational. Each game is assigned to at least one category. *Organizational change* is the share of a firm's genres in year t that are new to the firm, i.e., the sum of new genre entries in year *t* divided by the sum of all active genres by a firm in year *t*. The measure ranges between 0 and 1. A value of 0 indicates no genre entries at all, while a value of 1 means that every genre a firm is active in in year *t* is new, so the firm has completely overhauled their genre portfolio that year.

Organizational change is often associated with higher performance variability (Greve 2003). To see if our dependent variable links to performance variability, we split our sample by the mean of *organizational change* into low and high levels. As shown in Figure 1, the standard deviation of the return on assets is 0.25 for low levels of *organizational change* and 0.33 for high levels. Using Levene's robust tests for equality of variances (Levene 1960) we find that the performance variances are significantly ($p < 0.01$) different from each other. Interestingly, performance differences between high and low levels of *organizational change* are not statistically different (-0.04 for high organizational change and -0.03 for low organizational change). This suggests that while low and high rates of organizational change generate similar average performance, they differ in their riskiness, as the performance variance is higher for high than for low levels.

- INSERT FIGURE 1 HERE -

Historical Comparison. Following the behavioral theory of the firm, we assume that performance is evaluated in light of current organizational aspirations. Aspiration levels are formed by looking at historical firm performance. We construct *historical comparison* as the difference between the publisher's performance and its historical aspiration level (Greve 2003). We use return on assets measured as net income divided by total assets to proxy for publisher performance (Bromiley and Harris 2014). Following prior work starting with Levinthal and March (1981), the historical aspiration level is an exponentially weighted average of prior performance:

$$A_{t+1} = \alpha P_t + (1-\alpha) A_t \,, \tag{1}$$

where *A* denotes the aspiration level, *P* is the performance measure, i.e., return on assets, *t* is a time subscript and α is the weight placed on current performance to update aspirations. The parameter α reflects the speed of goal adjustment and lies between zero and one. We determine the appropriate value of α by performing a grid search, i.e., we calculated firm-specific historical aspiration levels for values of α between 0.01 and 0.99 with intermediate steps of 0.01 and then ran our baseline regression for each value (Greve 2003). The best fit was obtained for a value of α = 0.78, indicating quick adjustment of aspiration levels. We discuss the robustness of our results to slower adjustment rates below (Greve 2002).

Product-market resources: internal franchises. Product-market resources stabilize market responses to new products. Accordingly, we use the share of internal franchises, measured as the percentage share of newly released games in a given year based on internally developed franchises, as a proxy for a market resource. Internal franchises are series of games drawing on the same intellectual property like characters, setting, and trademarks developed and owned by the publisher. A large share of revenues in the electronic game industry is made by such franchises. Activision Blizzard, one of the world's largest publishers, derived about 80% of net revenues in 2013 from three internally developed franchises "Call of Duty", "Skylanders" and "World of Warcraft" (Activision Blizzard, 2014).

Technological resources: internal developer resources. Our conceptual argument states that technological resources improve operational aspects of game development, but do not reduce ambiguity

about market responses. Thus, to proxy for a technological resource we use the variable *internal developer resources*, measured as the share of games developed in-house in a given year. Publishers either publish games developed by an in-house developer studio, i.e., owned by the publisher, or by an independent studio. Developer studios typically specialize on a narrow range of genres building strong capabilities in these genres. Developers are active in 1.74 genres on average, while publishers cover 4.06 genres on average, so that owning a developer studio gives a publisher a specific technological capability.

Financial resources measures the financial resources of a firm not committed to any particular genre or game and easily deployed across genres. This reflects the value of cash resources as fungible resources (Kim and Bettis 2014). Following prior work (e.g. Mishina et al. 2010) we measure *financial resources* as the ratio of cash and cash equivalent divided by current liabilities. We do not expect financial resources to have an effect on the way firms are able to interpret market signals but to affect the incentives to respond. We also control for the direct effect of financial resources on organizational change, because prior work argued for a positive relationship between financial resources and change.

Industry experience. As we argue in our theory section, firms gather experience as they remain in the industry, which helps them interpret performance feedback. Measuring *industry experience* as the difference between the focal year and the year in which the firm released its first game captures possible inertia, but also firms' ability to make sense of the signals they receive.

Mapping resource measures to our theoretical constructs. We make a number of assumptions about the mechanisms by which different resources affect a firm's propensity to react to performance feedback. First, industry experience and internal franchises help firms interpret market feedback more precisely. Accordingly, we would expect games developed by experienced firms and games based on an internal franchise to display less variance in financial performance as market signals can be interpreted more precisely. We measure the financial performance of a game by calculating the natural logarithm of all revenues a game made in North America in the first twelve months after its release. In line with our assumptions, we find that franchise-based games have significantly lower standard deviation (1.966 vs. 2.125, $p < 0.01$) and that experienced firms develop games with significantly lower standard deviation

(1.741 vs. 1.881, $p < 0.01$). Second, internal developer resources stabilize operational performance, but do not help firms in the interpretation of market signals. Hence, while there should be no difference in the variance for games developed in-house, we expect games developed in-house to display lower variance in the games' critics' score as a measure of operational reliability. In line with our reasoning, the standard deviations for games developed in-house (2.109 vs. 2.017, not significant) are not significantly different but the critics' score for in-house games has significantly lower standard deviation (12.125 vs. 13.403, $p < 0.01$). Finally, we theorized that financial resources do not affect the ability to receive and interpret market signals, but to afford firms the stability to sit out periods of lowered performance. In line with our expectation, games published by firms with ample or few financial resources (1.823 vs. 1.798, not significant) do not differ in terms of their variance.[1]

Control and indicator variables. In addition to the direct effects of the resources we discussed above, we include a number of controls to account for factors other than performance feedback that may affect the relative number of niche entries. Portfolio size measures the number of games a publisher introduced in the previous year. The degree of organizational change may not only be affected by portfolio size, but also its composition in the previous year. We thus include the variable portfolio concentration, measured as the sum of squares of the share of released games in each genre on the publisher's complete portfolio in the previous year. To control for the influence of publisher size on portfolio change we include the natural logarithm of the revenue of the publisher in '000s USD in a given year. As firms might enter more genres if the industry is increasing in size due to the increased appeal to a wider range of audiences, we include the variable industry size.[2] Industry size measures the number of all games released in the prior year. All independent and control variables are lagged by one year.

[1] Incidentally, all four resources contribute to higher financial game success on average, suggesting that we are indeed capturing valuable resources (that are not easily imitable, otherwise the industry would exclusively produce franchise-based games and in-house games).

[2] While including year dummies to control for general changes in the industry yields similar results in terms of signs and significance, year dummies had variance inflation factors up to 18.97 indicating potential problems of multicollinearity. We thus did not include year dummies in our preferred regressions.

Estimation Method

We use a random-effects generalized least square (GLS) approach for linear panel regression models with a first-order autoregressive error term and are unequally spaced over time (Baltagi and Wu 1999). The method is appropriate for several reasons. First, a test for serial correlation proposed by Wooldridge (2010) revealed that the error terms are serially correlated ($F = 11.21$, $p < 0.01$). As serial correlation in cross-sectional time-series models biases the standard errors and reduces the efficiency of the results (Drukker 2003), we control for AR(1) serially correlated errors in our analysis. Second, while it is possible to control for this type of error term in feasible generalized least square (FGLS) regression models, FGLS models require that the observations are equally spaced over time. However, as not every publisher releases new games in each year this is not the case in our data. Third, following prior literature (e.g. Beckman et al. 2004) we use random effects for two reasons. Fixed-effects models predict the within-firm temporal change in a dependent variable, but we are interested in explaining the variance across firms in organizational change. Further, random effects are preferred if some independent variables X_{it} and X_{it-1} are correlated across time, which they are in our case (Johnston and DiNardo 1997). We used STATA 13 for our regressions. We interpret the significance of interaction terms by using parameter estimates to construct marginal effect plots for all four moderation effects.

Results

Table 1 gives pairwise correlations and descriptive statistics of the variables used. The mean of our dependent variable is 0.21 indicating that firms do not engage in much organizational change but rather stick with the genres they have been active in in the previous year. As the mean number of genres is 4.06, publishers enter 0.85 new genres a year on average.

- INSERT TABLE 1 HERE -

We present results for our random effects GLS regressions in Table 2. Model 1 is the resources and controls-only model. Three of our four resource variables have a direct effect on organizational change. First, *internal franchises* has a negative and significant ($\beta = -0.1847$, $p < 0.01$) effect on organizational

change indicating that publishers that release a larger share of games based on internally developed IP change their portfolio less. Second, the coefficient of *internal developer resources* is negative and significant ($\beta = -0.2452$, $p < 0.01$). This shows that the portfolios of publishers who launch more games developed in-house undergo less change. Third, financial resources have a positive and significant ($\beta = 0.0251$, $p < 0.01$) effect on our outcome variable. This indicates that publishers who are endowed with more financial resources change their portfolio more. Industry experience has no significant direct effect on organizational change. Further, three control variables are significant in all models. *Portfolio size* has a negative and significant ($\beta = -0.0016$, $p < 0.01$) impact on organizational change, indicating that larger portfolios get adjusted less. Conversely, *portfolio concentration* has a positive and significant ($\beta = 0.5327$, $p < 0.01$) effect on organizational change so that portfolios with games concentrated on a few genres exhibit higher genre entry rates. The coefficient of *industry size* is negative and significant ($\beta = -0.0001$, $p < 0.1$) showing that the larger or the more mature the industry the less firms enter new niches which could indicate increasing specialization of firms in more mature industries. Firm size is not significant, which suggests that portfolio-related measures of the scope of firm activities is more suitable for explaining portfolio change.

- INSERT TABLE 2 HERE -

In Model 2 we analyze the effect of performance feedback on organizational change. Following Hypothesis 1, firms receiving more favorable performance feedback engage in less organizational change. This is supported by the negative and significant ($\beta = -0.1017$, $p < 0.01$) coefficient of historical comparison. An increase of the variable by one standard deviation leads to a reduction of organizational change by 0.2 standard deviations.

Hypothesis 2 states that the relationship between performance feedback and organizational change is positively moderated by larger stocks of product-market resources. As the coefficient for performance feedback is negative, a positive moderation effect implies a negative coefficient on the interaction term. In line with our prediction, the interaction between *historical comparison* and *internal franchises* is

negative and significant (β = -0.0921 p < 0.01 in Model 6). The marginal effect of *historical comparison* for different shares of *internal franchises* (shown in Figure 2a) decreases in Model 6 from -0.0453 for firms with no internal franchises to -0.1374 for firms with a 100% share of internal franchises.

- INSERT FIGURE 2 HERE -

Model 4 reports the test of Hypothesis 3 that larger stocks of technological resources negatively moderate the relationship between performance feedback and organizational change. Supporting our hypothesis, the interaction effect of *historical comparison* and *internal developer resources* is positive and significant (β = 0.2661, p < 0.01). The marginal effect of *historical comparison* moderated by *internal developer resources*, shown in Figure 2b, is only significant for values of *internal developer resources* of zero and above 0.4, which is the case for about 92% of all observations in our sample.

Hypothesis 4 predicts that larger stocks of financial resources negatively moderate the relationship between performance feedback and organizational change. The interaction term between historical comparison and financial resources is positive and significant (β = 0.0911, p < 0.01 in Model 6). As shown in Figure 2c, the marginal effect of historical comparison increases with financial resources from -0.0453 for firms with no financial resources to 0.7840 for firms with the highest level of financial resources (=9.13) in our sample. However, the marginal effect is only significant for firms with no financial resources and firms with financial resources above a value of 1.1, which is the case for 25% of all observations in our sample.

Finally, Model 6 reports our results for Hypothesis 5, which predicts that larger stocks of industry experience positively moderate the relationship between performance feedback and organizational change. The coefficient of the interaction of historical comparison and industry experience is positive and significant (β = -0.0079, p < 0.01). The marginal effect of historical comparison for different levels of industry experience, as shown in Figure 2d, is increasing from -0.0453 to -0.2744. The effect is significant for all values of industry experience.

Further Analyses

To check the robustness with respect to our estimation strategy and alternative performance feedback measures and specifications, we run further analyses in Table 3.

- INSERT TABLE 3 HERE -

In the first column, we replicate the results of our preferred model. In column 2, we rerun the model using a random effects Tobit specification. While using GLS is important to control for the first-order autoregressive error term and the fact that our observations are unequally spaced over time, we face a second challenge in our regressions. Our dependent variable is bounded between zero and one and about 42% of our observations are clustered at the lower bound, i.e., at zero. In this case a two-sided Tobit model is appropriate as it uses all observations for estimation (Greene 2008). The Tobit results are consistent with most results from the GLS model as the coefficients are similar in sign and significance compared to Model 1, providing further support for Hypotheses 2-5. Only the direct effect of *historical comparison* is not significant in the Tobit specification.

While a grid search revealed that we achieve the best overall model fit by using a value of $\alpha = 0.78$ to build the historical comparison measure check if using a smaller α indicating slow adjustments of aspirations changes our results (Greve 2002). Hence, we re-ran the full model using $\alpha = 0.25$ for the historical comparison variable and its interaction terms. This implies that firms place lower weight on the immediate past and correspondingly higher weight on past performance. The coefficients of Model 3 are similar in terms of significance and sign to our baseline model lending further support to our hypotheses.

Organizations may also compare their performance with that of similar organizations in a process of *social comparison* to assess current performance (Greve 2003). Hence, we build an alternative measure of performance feedback, *social comparison*, as the difference between a publisher's annual performance and its social aspiration level. Following prior work (e.g. Greve 2003; Mishina et al. 2010), we define the social aspiration level as the average return on assets of all other firms in a given year. In Model 4 we run the full model with *social comparison* as a measure of performance feedback. We find strong support for

Hypotheses 1, 2, 3 and 4. However, the coefficient for the interaction term of industry experience with social comparison is not significant. Thus, Hypothesis 5 has no support in our social comparison model.

As firms might react differently to positive and negative performance feedback, we include a spline function for performance feedback in Model 5. This allows the variable *historical comparison* to have different slopes above and below zero. We do this by adding both a dummy variable *pos. historical comparison,* which equals one if a firm receives positive performance feedback, i.e., performance above the aspiration level and an interaction term of the dummy and the linear term of historical comparison. As in previous models the coefficient of *historical comparison* is negative and significant ($\beta = -0.0707$, $p < 0.05$). The coefficient of the dummy variable *pos. historical comparison* and the coefficient of the interaction term of the dummy and the linear term are both insignificant. Hence, in our specification firms do not react differently to positive and negative performance feedback.

Discussion

Performance feedback is often ambiguous because performance depends on complex interactions with many environmental variables such as demand conditions, competitor actions, or regulatory interventions. In such ambiguous settings, organizations may benefit from slower adaptation to performance feedback. We study how organizational resources affect both the value and ability of firms to engage in slower adaptation and thereby contribute to organizational heterogeneity in responding to feedback. We proposed that product-market resources like established brands increase predictability in the business environment and reduce causal ambiguity about the environment. They lower the value of slower adaptation and allow firms to be more responsive to performance feedback. In contrast, technological resources do not reduce causal ambiguity about the market environment. Rather, firms with large stocks of technological resources have a higher risk of moving away from superior actions, and they potentially benefit more from slower adaptation, making them less responsive to feedback. Greater stocks of financial resources buffer organizations from internal and external performance pressures and enable slower adaptation.

Finally, more experience in a particular industry leads to a better causal understanding and a more informed appreciation of how external variables affect performance as long as the environment does not undergo radical change, thereby facilitating more rapid adaptation to negative feedback. Hence, more experienced firms in an industry respond more strongly to performance feedback than inexperienced ones.

We found our hypotheses to be confirmed and robust to alternative specifications and variable definitions. Consistent with the basic tenet of the behavioral theory of the firm we found that organizations receiving less favorable performance feedback engage in more organizational change even in a highly dynamic environment like the video games industry. We further found that the share of games developed in-house reduces the responsiveness of publishers to performance feedback while both the share of games based on an internal franchise as well as a firm's experience in the games industry have a positive effect on a publisher's propensity to act upon performance feedback. Finally, firms with ample financial resources can afford to respond slowly to negative market signals as they can withstand the pressure to act immediately.

Theoretical Contributions

Our paper makes three contributions. First, we contribute to the literature on performance feedback and its organizational consequences. While prior work showed how variations in organizational aspirations affect organizational decision-making, we offer a complementary perspective that highlights resources as a source of organizational heterogeneity in responding to feedback. Our key insight is that larger stocks of technological and financial resources make firms less responsive to feedback, while product-market resources and industry experience make them more responsive. We thereby identify and theorize an organizational factor that is not well integrated into standard models of how performance feedback affects organizational change and adaptation. Following early work in the behavioral theory of the firm, much of the present work on the topic looks at the direct effect of organizational resources – especially slack resources – on change and adaptation (Kraatz and Zajac 2001; Voss et al. 2008). In contrast, we emphasize how resources influence and moderate the causal relationship between feedback and adaptation. As argued above, some resource types promote less responsiveness and more inertia, while

others facilitate more rapid adaptation. Controlling for age and size effects, greater stocks of technological and financial resources thus render firms more inert. Counter-intuitively, financial resources slow down responses to feedback, although more financial resources imply more baseline organizational change. Yet, increased inertia may lead to slower adaptation and better decision-making in ambiguous environments.

Second, we developed our theory by drawing on earlier work on organizational learning that shows how slower adaptation improves the identification of superior actions (Denrell and March 2001; March and Olsen 1975). Thus our claims about the value of slower adaptation in ambiguous environment are not novel. Rather, what we add to the organizational learning perspective is the idea that current resource stocks affect the organizational value and ability to engage in slower adaptation. We highlight organizational differences in the same ambiguous task environments, while most work on the value of slower adaptation only examines variations across task environments (Greve 2002; Levinthal and Posen 2007; Puranam et al. 2015). This also suggests an important boundary condition for our analysis. Our theoretical argument is that organizations face ambiguous environments in which the complex causal structure of how internal and external variables map onto performance outcomes is little understood. In simple environments in which feedback provides clear evidence about the value of actions slower adaptation does not offer any benefits. We would therefor expect the hypothesized effects to become less significant in simpler task environments in which causal ambiguity is reduced for all organizations.

Finally, we also speak to the literature on causal ambiguity and its consequences for organizational decision-making and performance (Mosakowski 1997; Powell et al. 2006). Prior work in strategy emphasizes causal ambiguity as an isolating mechanism that contributes to sustainable competitive advantages (King 2007; King and Zeithaml 2001), while organizational learning scholars stress how causal ambiguity complicates the codification and replication of organizational practices (Szulanski et al. 2004; Zollo and Winter 2002). Hence, the emphasis of most research in this domain has been how causal ambiguity within and across organizations influence competence development and deployment. In contrast to causal ambiguity as an organizational phenomenon, we focus on causal system ambiguity as a relevant dimension of an organization's external task environment and examine its effects on

organizational decision-making. As discussed above, our central idea is that feedback is perceived differently and has different behavioral consequences in more ambiguous task environments. Yet, while our study emphasized the link between current stocks of resources and how they impact responding to performance feedback, it stops short of considering the dynamic properties of such processes. Organizational responses to performance feedback trigger changes in organizational actions, which in turn impact competence development and resource accumulation in an organization (and even across firms, when their performance is affected by the actions of the focal firm). Changes processes thus affect future stocks of resources and behavioral responses. Our conceptual model focuses on just one, albeit fundamental, mechanism in such a dynamic process of resource accumulation and organizational adaptation over time.

Managerial Implications

Organizational change following ambiguous signals is a risky business. The variability in outcomes increases in the extent of organizational change, and there is no clear indication that expected performance increases accordingly (Henkel 2009). While negative performance feedback may trigger problemistic search, managers should be aware that both the upside and the downside risk increases as a result. Thus, rather than simply reacting to performance feedback, organizational change should be a function of the firm's ability to read environmental signals and the risk attitudes of managers.

Further, contrary to what one would expect, comparatively old and established firms tend to be more responsive to feedback because they are able to interpret market signals relatively precisely, as long as the environment does not change radically. Hence, in addition to the intuition that large and established firms tend to be observed by most of the industry for their prominence (Ferrier et al. 1999), another motivation to follow their portfolio choices might be because they can "read the market" more accurately. Paying particular attention to the moves by industry veterans can then help younger firms survive the delicate early phases in the market, which seems especially relevant when considering that the performance variability of established firms tends to be lower as a result of more informed choices.

Finally, in turbulent industries like video games, the ambiguity of signals a firm receives may justify being slow to respond to performance feedback. In contrast to most recommendations that firms have to be prepared to constantly change tack and react to even small changes in their respective industries (Grove 1996), firms might benefit from stability and continued gathering of signals from the market before making a decision. This is especially true if abandoning a current action entails considerable costs, e.g. sunk costs that would have to be invested again upon re-entry, and if the firm has sufficient financial resources to afford a performance shortfall for a limited time.

Limitations and Future Research

Our study could be extended in a number of ways. First, while we perceive the focus on a single industry as a strength that lets us get closer empirically at the true mechanisms we want to investigate, studying an industry that goes through phases of relative turbulence and stability would be useful to identify the boundary conditions of our arguments. After all, much of our argument builds on the notion that firms cannot interpret environmental signals accurately (which is plausible in our setting), and it would be fruitful to observe an exogenous shift in the precision of signals (Bloom 2009). Second, we focus on four resources that matter in the specific context we study, but a broader definition of the resources and processes that let firms interpret signals with more or less precision would be useful. Initial observations show that the different resources we measure indeed have a variance-reducing or –amplifying effect, but including additional resources or even a direct measure of the accuracy with which firms perceive and interpret external signal would present an exciting opportunity for future research. Finally, we note that our study aims at identifying the determinants of organizational change. While we believe that this is an important first step in a refined theory of organizational change based on performance feedback and organizational resources, we hope to extend this line of research by considering a fully dynamic model of performance antecedents and consequences of organizational change.

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Table 1 Descriptive Statistics and Pairwise Correlations

	Variable	Mean	S.d.	Min	Max	1	2	3	4	5	6	7	8	9
1	*Organizational change*	0.21	0.25	0	1	1								
2	*Historical comparison (α=.78)*	-0.05	0.42	-2.87	4.08	-0.25	1							
3	*Internal franchises*	0.66	0.27	0	1	-0.37	0.02	1						
4	*Internal developer resources*	0.52	0.32	0	1	-0.4	0.08	0.45	1					
5	*Financial resources*	0.89	1.24	0.00	9.13	0.12	0.05	0.11	0.12	1				
6	*Industry experience*	13.06	7.01	0	30	-0.25	0.02	0.19	0.33	0.07	1			
7	*Portfolio size*	24.60	25.80	1	145	-0.43	0.02	0.29	0.34	-0.02	0.39	1		
8	*Portfolio concentration*	0.40	0.20	0.16	1	0.5	-0.15	-0.16	-0.16	0.1	-0.27	-0.37	1	
9	*Firm size*	12.41	2.61	4.38	18.30	-0.25	0.07	0.15	0.32	-0.01	0.45	0.52	-0.23	1
10	*Industry size*	2184.85	382.58	1166	3099	-0.05	-0.04	-0.03	-0.09	-0.03	0.13	0.06	0.06	0

Note. Correlations greater than |0.12| are significant at 1% (N = 526).

Table 2 Results of Random Effects GLS Regression of Historical Comparison on Organizational Change (N = 526)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
PERFORMANCE FEEDBACK						
Historical comparison		-0.1017***	-0.0634**	-0.1318***	-0.1169***	-0.0453*
		(0.0173)	(0.0298)	(0.0208)	(0.0198)	(0.0274)
INTERACTION TERMS						
*Internal franchises*Historical comparison*			-0.0734	-0.1029***	-0.1111***	-0.0921***
			(0.0463)	(0.0322)	(0.0305)	(0.0306)
*Internal developer resources*Historical comparison*				0.2661***	0.2551***	0.2585***
				(0.0112)	(0.0108)	(0.0107)
*Financial resources*Historical comparison*					0.0858***	0.0911***
					(0.0112)	(0.0111)
*General genre experience*Historical comparison*						-0.0079***
						(0.0021)
RESOURCES						
Internal franchises	-0.1847***	-0.1912***	-0.2000***	-0.0675***	-0.0731***	-0.0711***
	(0.0344)	(0.0333)	(0.0338)	(0.0240)	(0.0228)	(0.0226)
Internal developer resources	-0.2452***	-0.2435***	-0.2484***	-0.0796***	-0.0874***	-0.0868***
	(0.0342)	(0.0332)	(0.0333)	(0.0236)	(0.0224)	(0.0221)
Financial resources	0.0251***	0.0285***	0.0294***	0.0158***	0.0187***	0.0190***
	(0.0075)	(0.0073)	(0.0073)	(0.0050)	(0.0048)	(0.0047)
Industry experience	0.0020	0.0015	0.0015	-0.0000	0.0004	0.0001
	(0.0019)	(0.0018)	(0.0018)	(0.0012)	(0.0011)	(0.0011)
CONTROLS						
Portfolio size	-0.0016***	-0.0018***	-0.0018***	-0.0008**	-0.0006**	-0.0006*
	(0.0005)	(0.0005)	(0.0005)	(0.0003)	(0.0003)	(0.0003)
Portfolio concentration	0.5327***	0.4919***	0.4888***	0.3976***	0.3689***	0.3671***
	(0.0465)	(0.0456)	(0.0456)	(0.0314)	(0.0299)	(0.0295)
Firm size	0.0036	0.0058	0.0060	-0.0002	-0.0029	-0.0030
	(0.0058)	(0.0057)	(0.0057)	(0.0037)	(0.0035)	(0.0035)
Industry size	-0.0001***	-0.0001***	-0.0001***	-0.0000**	-0.0000**	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Constant	0.3443***	0.3394***	0.3455***	0.3313***	0.3619***	0.3719***
	(0.0903)	(0.0877)	(0.0875)	(0.0576)	(0.0549)	(0.0539)
$\chi 2$	374.5	433.4	437.1	1468	1691	1747

Notes. Standard errors are in parentheses. AR(1) error structure. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3 Robustness Checks (N = 526)

Variable	Model 1 RE GLS	Model 2 Tobit	Model 3 RE GLS α=25	Model 4 RE GLS Social Comparison	Model 5 RE GLS Spline Function
PERFORMANCE FEEDBACK					
Historical comparison	-0.0453*	-0.0393	-0.0743***		-0.0707**
	(0.0274)	(0.0265)	(0.0282)		(0.0324)
Pos. historical comparison					0.0007
					(0.0115)
*Historical comparison*Pos. historical comparison*					0.0544
					(0.0349)
Social comparison				-0.1400***	
				(0.0314)	
INTERACTION TERMS					
*Internal franchises*Historical comparison*	-0.0921***	-0.0989***	-0.0934***		-0.0853***
	(0.0306)	(0.0301)	(0.0322)		(0.0310)
*Internal developer resources*Historical comparison*	0.2585***	0.2623***	0.2600***		0.2566***
	(0.0107)	(0.0107)	(0.0107)		(0.0107)
*Financial resources*Historical comparison*	0.0911***	0.0925***	0.0533***		0.0815***
	(0.0111)	(0.0109)	(0.0086)		(0.0130)
*Industry experience*Historical comparison*	-0.0079***	-0.0085***	-0.0068***		-0.0078***
	(0.0021)	(0.0021)	(0.0022)		(0.0021)
*Internal franchises*Social comparison*				-0.0929***	
				(0.0334)	
Internal developer resources Social comparison*				0.3279***	
				(0.0147)	
*Financial resources*Social comparison*				0.0630***	
				(0.0135)	
*Industry experience*Social comparison*				-0.0036	
				(0.0024)	
RESOURCES					
Internal franchises	-0.0711***	-0.0747***	-0.0653***	-0.0824***	-0.0679***
	(0.0226)	(0.0223)	(0.0229)	(0.0239)	(0.0227)
Internal developer resources	-0.0868***	-0.0794***	-0.0850***	-0.0867***	-0.0876***
	(0.0221)	(0.0219)	(0.0223)	(0.0238)	(0.0221)
Financial resources	0.0190***	0.0179***	0.0145***	0.0182***	0.0201***
	(0.0047)	(0.0046)	(0.0048)	(0.0051)	(0.0048)
Industrty experience	0.0001	-0.0002	-0.0001	-0.0005	0.0000
	(0.0011)	(0.0011)	(0.0011)	(0.0012)	(0.0011)
CONTROLS					
$\chi 2$	1747	1813	1687	1500	1750
Log-likelihood		409.6			

Notes. Standard errors are in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 1 Distribution of Return on Assets for High and Low Levels of Organizational Change

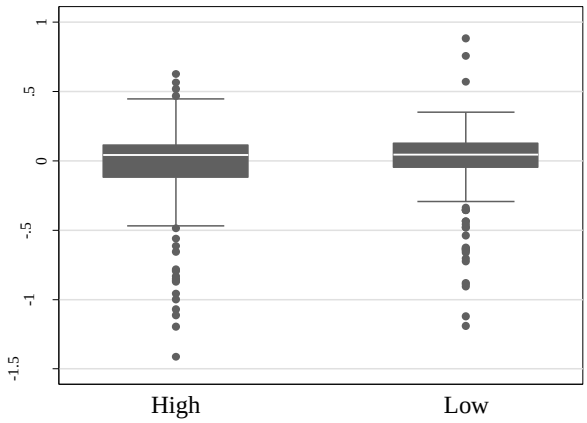

Figure 2 Marginal Effects of Historical Comparison Moderated by Different Types of Resources