DRUID Working Paper No. 06-4

Evaluation of Uncertain International Markets: The Advantage of Flexible Organization Structures

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Draft of October 7, 2005

Abstract:
The present article is concerned with organizational flexibility in transnational corporations (TNCs), i.e., larger firms that operate in multiple national markets. Contrasting prior research into entry modes (e.g. joint ventures, greenfield investments, or acquisitions), the present article examines the way the organization of evaluation teams can influence entry and exit decisions of business units. Empirical studies broadly support the claim that TNCs experiment with flexible organizational structures in response to increased levels of turbulence and uncertainty in international markets. However, these advances in the description of TNCs, and more generally in the literature on new organizational forms, have been largely ignored in our theories about evaluation of market opportunities in TNCs and multi-national corporations (MNCs). To address this gap in our knowledge, the present article examines the effects of flexible evaluation teams when TNCs assess the viability of international markets characterized by high levels of uncertainty. Remarkably, we show that TNCs employing flexible teams of (very) fallible evaluators can obtain profits at levels that asymptote optimality. Our main result supports the claim advanced in recent empirical studies. Structural flexibility can help TNCs employing (very) fallible evaluators achieve high levels of performance in conditions of turbulence and uncertainty.

Key words: Multinational corporations, entry modes
JEL Codes: F23, D81

ISBN 87-7873-193-3

DRUID

Acknowledgements

This paper received the best paper award of the 3rd annual JIBS/AIB/CIBER invitational conference, September 2005. Comments from Arie Y. Lewin, Bill McKelvey, Paola Perez-Aleman, Phanish Puranam, Henk W. Volberda and other participants are gratefully acknowledged.

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1 Introduction

The present article is concerned with organizational flexibility in trans-national corporations (TNCs), i.e., larger firms that operate in multiple national markets. Contrasting prior research on entry modes (e.g. joint ventures, greenfield investments, or acquisitions), the present article examines the way the organization of evaluation teams can influence entry and exit decisions.

Recent empirical studies broadly support the claim that TNCs experiment with flexible organizational structures in response to increased levels of turbulence and uncertainty in international markets. However, these advances in the description of TNCs, and more generally in the literature on new organizational forms, have been largely ignored in our theories about evaluation of market opportunities in TNCs and MNCs. To address this gap in our knowledge, the present article examines the effects of flexible evaluation teams when TNCs assess the viability of international markets characterized by high levels of uncertainty.

A critical issue is the problem of entry and exit in uncertain international markets, whether by joint ventures, greenfield investments, or acquisitions (Kogut & Singh, 1988; Reuer, 2000). Costly mistakes get made. TNCs enter markets that turn out to offer losses and they stay clear of markets that would have been sources of gains. There is a similar problem of deciding when to exit. Under uncertain conditions, a promising market opportunity can turn sour. Sometimes, TNCs exit markets when their continued presence would have led to gains and they fail to exit markets even when a continued presence only leads to further losses. Costly mistakes get made, and increased market uncertainty can lead to both more frequent and more severe mistakes. We examine whether flexible organization structures can somehow be designed to reduce such mistakes and thus increase rents, as claimed in the literature on new organizational forms (Child, 1997; Heydebrand, 1989; Ilinitch, D'Aveni, & Lewin, 1996; Lewin & Volberda, 1999; Volberda, 1996, 1998; Zahra & O'Neill, 1998).

We relate these insights to a fairly recent effort in the study of entry and exit decisions in response to uncertainty in international markets (Delios & Henisz, 2003; Kogut & Singh, 1988; Reuer, 2000). Delios & Henisz (2003) found changes in investment sequences occur because firms shift from an emphasis on developing knowledge about international markets and consumers in low-hazards markets to an international expansion strategy in uncertain policy environments. Thus, evaluation of market opportunities in uncertain policy environments was a critical determinant of entry and exit. While research into the efficacy of alternative *modes* of entry and exit into international markets (e.g. joint ventures, greenfield investments, or acquisitions) has a long pedigree, there has been little research into the way *evaluation* of market opportunities influence entry and exit in international markets (exceptions are Delios & Henisz, 2003; Reuer, 2000). The present article offers a framework that helps think about these issues in a systematic way.

We develop a modeling structure that allows comparison of industry entry and exit under alternative assumptions of managerial ability and different levels of market turbulence. Three types of decision makers - the optimizer, the local searcher, and the fallible evaluator - are compared in a generic entry-exit model where uncertain conditions in an international market is modeled as fluctuating short-run profits. Two extreme forms of evaluation teams - the hierarchy and the polyarchy (a flat team) - are considered. The aim of the model is to examine whether teams of fallible evaluators can benefit from being located in flexible organizations, e.g., from shifting between hierarchical and polyarchical modes of organization.

The article is organized as follows. Section 2 below reviews the literature on new organizational forms. A broad empirical literature supports a claim that flexibility outperforms rigidity under conditions of pervasive uncertainty and high turbulence in international markets. Section 3 develops a modeling structure that allows comparison of industry entry and exit under alternative assumptions of managerial ability and different levels of market turbulence. We also examine whether teams of fallible evaluators can benefit from being located in flexible organizations. Remarkably, we show that TNCs employing flexible teams of fallible evaluators can obtain high levels of profits even under conditions of pervasive uncertainty. Section 4 considers implications and concludes the article.

2 Literature Review

The recent decade's research on organizational forms has gained headway in converging upon a few particularly important causes of the new forms that have been observed. Reflecting wide agreement in the organization literature, Child & McGrath (2001) in their introduction to nine articles in a special research forum on new organizational forms, published in the *Academy of Management Journal*, pointed to increased information intensity and internationalization as the main challenges that have resulted in the emergence of the new forms.

The mentioned challenges were usefully grouped into four broad categories: (1) increased interdependence in interaction among organizations, (2) the possibility of disembodiment of performance from asset ownership, (3) higher velocity characterizing almost all aspects of organizational functioning, and (4) changes in power, in terms of a shift from a power-base of tangible assets and inputs to power derived from possession of knowledge and information. The widely observed new organizational forms, it is argued, have emerged in response to these challenges. According to Child & McGrath (2001), the objective of the new form is to delegate decision rights to where the relevant knowledge and information reside, then to use information technology (IT) for support.

In contract economics, this move of decision rights, closer to those with information, has been referred to as the "organization redesign solution," as opposed to the traditional MIS solution according to which it is information which is moved closer to the decision maker (Brynjolfsson & Mendelson, 1993; Jensen and Meckling, 1992; Nault, 1998). Fundamental advances in IT and measurement technologies have facilitated a number of experiments with organizational forms (Nault, 1998; Zenger & Hesterly 1997) that are often referred to by the notion of "new organizational form" (Daft & Lewin 1993). A common characteristic of these experiments is the use of IT in hierarchies to achieve a decentralization of decision rights (Child & McGrath, 2001; Nault, 1998). Whereas advances in IT are commonly viewed as a facilitator of new forms, hypercompetition is seen as the primary cause of their emergence since traditional forms are considered maladaptive when massive change, environmental dynamism, and considerable uncertainty are the norm (Child & McGrath, 2001; Daft & Lewin, 1993; Volberda, 1996).

Hypercompetition refers to the shift in the rules of competition observed through the 1990s (Ilinitch, D'Aveni & Lewin, 1996; Volberda, 1996). It is argued that rapid technological change, the shortening of product life cycles, and the increasing aggressiveness of competitors have led to increasingly shorter periods of competitive advantage, punctuated by frequent disruptions. Often, hypercompetition is associated with fundamental uncertainty as in Volberda's (1996, 366-367) proposition that organizational forms must be flexible under hypercompetition: "In a fundamentally unpredictable environment which may also be dynamic and complex (hypercompetitive), the optimal form employs a broad flexibility mix dominated by structural and strategic flexibility and has a nonroutine technology, an organic structure, and an innovative culture." Volberda (1996) nicely sums up the argument for flexibility that has been forwarded in much of the literature on new organizational forms: "In the new mode of hypercompetition rents do not derive from specialized routines but from adaptive capability. The reason is that, with hypercompetition, competitive change cannot be predicted but only responded to more or less efficiently, ex post." (Volberda, 1996, 360). The identified imperative of firm-level flexibility is, in turn, stressing the need to maintain some level of organizational consistency. Thus, it has been emphasized that organizations must respond to the twin pressures of exploitation and exploration highlighted by March (1991). That is, organizations need to exhibit increasing flexibility while maintaining consistency and reliability (Bartlett & Ghoshal, 1998; Volberda, 1996, 1998).

A broad empirical literature supports the argument that flexibility outperforms rigidity under conditions of pervasive uncertainty.[1] If we examine the observed

[1] An exception is Becker & Knudsen (2004) who find that routinization can help managers focus on issues that *can* be solved, as opposed to wasting resources in the pursuit of problems that

changes in organizational characteristics in more detail, an impressionistic picture with marked features appears, including downsizing (Bowman, Singh, Useem & Bhadury, 1999), a trend toward more collaborative business relationships (Cannon & Homburg, 2001; Nault & Tyagi, 2001), network organizations (Achrol, 1997), flexibility achieved by more organic and temporary work arrangements (Bigley & Roberts, 2001; Child, 1997; Heydebrand, 1989; Ilinitch, D'Aveni, & Lewin, 1996; Lewin & Volberda, 1999; Zahra & O'Neill, 1998), more nimble governance structures (Cecil, Ciccotello & Terry, 1995; Kole & Lehn, 1997), decentralization of decision rights (Moller & Rajala, 1999), and new employment contracts characterized by less commitment between employer and employee (Charness & Levine, 2002).

From an organizational economics viewpoint, these observations of new forms can be summarized as shifts: (1) from hierarchical organization to internal hybrids that operate "horizontally," e.g. by delegating decision rights to functional teams and project groups (Achrol, 1997; Moller & Rajala, 1999), and (2) from market organization to external hybrids that include vertical elements, e.g. by reducing to a minimum the core activities retained within one unit and assigning other responsibilities to semi-independent units (Child & McGrath, 2001).

A third widely noted feature is the flexibility of the new organizational forms that most empirical studies emphasize as crucial. The present article is concerned with organizational flexibility in TNCs. Empirical studies broadly support the claim that TNCs experiment with flexible organizational structures in response to increased levels of turbulence and uncertainty. However, these advances in the description of TNCs, and more generally in the literature on new organizational forms, have not been given much attention in our theories about evaluation of market opportunities in TNCs and MNCs.

To address this neglect, the present study aims to direct attention to the role of teams in TNCs evaluation of market opportunities. To help stimulate further research on this important topic, we develop a modeling structure from which testable propositions can be drawn. This effort adds to prior research on entry and exit decisions in TNCs and MNCs, including prior studies on the evaluation of foreign opportunities (Cavusgil, Kiyak & Yeniyurt 2004; Schooler, 1974). By examining flexible evaluation structures, we also add to prior studies, which examined the effect of voting rules in stable evaluation structures (Birnberg, Pondy & Davis, 1970).

The present article examines the effects of flexible evaluation teams when TNCs assess the viability of international markets characterized by high levels of uncertainty. A critical issue is the problem of entry and exit in uncertain international markets. Using the common analogy from statistical inference, TNCs make errors of omission (Type I error) and errors of commission (Type II error). TNCs enter markets that offer losses (commission error) and they stay clear of markets that would have been sources of gains (omission error). Not only is there a problem of deciding when to enter, there is also a problem of deciding when to exit. Under uncertain

are beyond solution.

conditions, a promising market opportunity can turn sour. Mistakes get made when TNCs leave an international market too early, or too late. Such mistakes are costly, and increased market uncertainty can lead to both more frequent and even more severe mistakes. We examine whether flexible organization structures can somehow be designed to reduce such mistakes and thus increase rents.

3 The Model

We develop a modeling structure that allows comparison of industry entry (exit) decisions under alternative assumptions of managerial ability and different levels of market turbulence. Three types of decision makers - the optimizer, the local searcher, and the fallible evaluator - are compared in an entry-exit model where uncertain conditions in an international market is modeled as a fluctuating short-run profit.

Individual evaluators: optimizer, local searcher, fallible evaluator. The TNC operates in an uncertain international market. We invoke standard assumptions from dynamic industry entry-exit models (Miranda & Fackler, 2002). The TNC observes the next period's potential operating profit (π_{t+1}), earned in case the TNC should be active (an inactive business unit earns an operating profit of zero). Based on this information, the decision maker estimates critical levels of operating profit at which an inactive business unit should enter and an active business unit should exit. The optimizer uses a standard numerical procedure (collocation method) to extract the optimal critical levels of operating profit from the Bellman equation. The optimizer is an unrealistic, but useful baseline against which the performance of fallible decision makers can be assessed.

The second type of decision maker is the local searcher, known from behavioral theories of the firm (Cyert & March, 1963; Knudsen & Levinthal, 2005; Lant & Mezias, 1990; Levinthal & March, 1981; Nelson and Winter, 1982). The set of alternative actions are not presumed to be laid out in their entirety ex-ante, but must be discovered or searched (Knudsen & Levinthal, 2005). In the present context, the local searcher enters a new market if operating profit is at least equal to zero (or some other cut-off point) and exits if the short-run profit becomes negative. In this way, such agents search for new markets that satisfy some minimum performance criteria (e.g. potential profit should be at least zero). However, another critical facet of bounded rationality has been largely ignored in behavioral theories of the firm and that is, how alternatives, once identified, are to be evaluated (Knudsen & Levinthal, 2005). While the local searcher is usually portrayed as being capable of perfect evaluation, we now introduce the fallible evaluator.

The third type of decision maker, the fallible evaluator, has imperfect discriminating ability. This type of decision maker behaves like the local searcher, but is not capable of making sharp evaluations of short-run profit for the reasons mentioned in the literature on new organizational forms and elsewhere (ambiguity, complex interactions, limited information, limited computation power, etc.). The discriminating ability of the fallible evaluator is modelled as a linear *screening function.* The slope of the line, indicated by the variable α, can be interpreted as the discriminating capability of the decision maker (see Figure 1). A steeper slope, or higher value of α, implies that the probability of entry will be centered around a narrow range of values (around zero) for short-term operating profit. With higher discriminating ability (α), a more narrow range of values of short-run operating profit can lead to entry (exit). By contrast, with lower discriminating ability (α), a wider range of values of short-run operating profit can lead to entry (exit). For a particular value of short-run operating profit, a (costly) reversal of a prior entry (exit) decision is increasingly likely with lower discriminating ability (α). Fallible evaluators are therefore prone to making costly mistakes.

– FIGURE 1 –

Evaluation teams. We use Christensen & Knudsen's (2004) recent extension of the Sah & Stiglitz (1985, 1986, 1988) characterization of organizational architectures to provide a framework with which to model evaluation in teams. The intuition of what follows is that fallible evaluators can (always) benefit from being placed in teams whereas local searchers are beyond help because they discriminate perfectly. Ironically, imperfect discrimination of fallible agents is a source of flexibility that can be utilized by designing appropriate evaluation teams whereas perfect discrimination of local searchers is a rigidity of that cannot be overcome.[2]

Local searchers are limited in their ability to search for new alternatives, but once identified, they are capable of perfect discrimination. Within the present context, local search therefore approaches optimality when the critical levels of operating profit becomes a single point – say, optimal entry (exit) for non-negative (negative) operating profit. This would be the case if entry and exit costs go to zero.

In contrast to local searchers, fallible agents are not capable of perfect discrimination. It can be shown, however, that fallible evaluators can be placed in teams such that their joint screening function comes arbitrarily close to perfect discrimination (Christensen & Knudsen, 2004). Then, under the assumption of (very) low costs of entry and exit, fallible evaluators could always gain from being located in fixed organization structures.

However, we are here interested in the more realistic case of significant exit and entry costs. In that case, optimal points of entry and exit are wide apart (e.g., see Figure 1). To help fallible agents overcome the inbuilt rigidity that only allows them to consider a single point of optimal exit and entry, we are led to consider the possible advantage of using flexible evaluation structures. In particular, we consider

[2] Remarkably, almost all of our formal models broadly relating to research in the tradition of the Behavioral Theory of the Firm promote a view of local search that is perfectly consistent with the present characterization of local searchers (Knudsen & Levinthal, 2005).

two extreme forms of evaluation structures. One is the hierarchy in which a proposal to enter (or exit) a market is validated at successive higher levels in the team. Only if the proposal is accepted at each level, will the TNC enter a new market. The second form is a polyarchy, a flat, decentralized structure in which approval by any one actor is sufficient for the proposal to be approved. A flexible organization of evaluation teams is modelled by shifting between the two forms of organization.

The effect of locating fallible evaluators (e.g. $\alpha = 0.10$) in a hierarchical form is shown in Figure 2. In what we term a hierarchy, the short-run profit is initially considered by a member of the decision team. If the proposal is rejected by that decision maker, it is eliminated from further consideration and the business unit discontinues its activities (or remains inactive). Alternatively, if the proposal is approved by that decision maker, then it is passed on to the next decision maker in the chain of command. A proposal is acted upon only if it is positively screened by all of the evaluators in the team. Formally, sequential decision making in a hierarchy corresponds to joint decision making in a team (or committee) where a proposal of entry is only accepted if each member accepts it. As can be seen from Figure 2, a hierarchical team of five fallible decision makers would accept entry with probability less than 0.10 if short-run operating profits were 1. By contrast, each of these would individually accept entry with probability 0.60. The hierarchy is a "sceptical" organizational form that tends to reinforce the status quo.

– FIGURE 2 –

The effect of locating fallible evaluators (e.g. $\alpha = 0.10$) in a flat team is shown in Figure 3. In the flat team, also known as a polyarchy, a proposed alternative can be adopted by any of the members of the evaluation team. Only if all decision makers in succession reject an alternative is it dismissed. Formally, sequential decision making in a polyarchy corresponds to joint decision making in a team (or committee) where a proposal of entry is accepted if only a single member accepts it. A polyarchical team of five fallible decision makers would accept entry with probability higher than 0.95 if the short-run operating profits were 1 even though each individual would accept entry with probability 0.60. The polyarchy is an "optimistic" organizational form that tends to promote change.

– FIGURE 3 –

Flexible organizational forms. The aim of the model is to examine whether teams of fallible evaluators can benefit from being located in flexible organizations, e.g., from shifting between hierarchical and flat, polyarchical modes of organization.[3]

[3] This case could also be viewed as a consistent use of a hierarchical form with shifting targets (accepting entry versus accepting exit). In joint decision making, this is equivalent to shifting from a rule requiring that each member of an evaluation team must accept entry to a new rule, requiring that only one member accepts continued presence, after entry.

The nature of the environment. The TNC considers whether it should operate in a local uncertain profit environment. More precisely, short-run profit is an exogenous Markov process.[4] The TNC observes the short-run profit π of the next period and decides whether it should enter the international market. The next period's potential profit is the exogenous Markov process:

$$\pi_{t+1} \; = \; h(\pi_t, \epsilon_{t+1}) \; = \; \bar{\pi} + \gamma(\pi_t - \bar{\pi}) + \epsilon_{t+1} \tag{1}$$

where ϵ are random shocks that are i.i.d. and normally distributed, $\mathcal{N}(\mu, \sigma^2)$, with mean $\mu = 0$ and variance σ^2. The parameter γ is the autoregressive coefficient, which determines the rate of reversal towards the mean, $\bar{\pi}$. The following analyses set $\bar{\pi} = 0$, but vary σ and γ in order to examine alternative levels of turbulence in international markets. With lower values of γ, the random fluctuations are dampened. Higher γ leads to longer spells of positive or negative profits and lower γ increases turbulence. Higher variance, σ^2, further accentuates turbulence within the broader environmental conditions defined by γ. As regards the observed increase in market turbulence reported in many empirical studies, this corresponds to a lowering of γ as well as an increase in σ^2 (in addition, increased difficulty in assessing market oppportunities suggests a lowering of α).

The state variables are the short-run profit, π, and the current operational status, o, of the TNC in the international market.[5] If the TNC is currently operating in the international market, o is one. If the TNC does not operate, o is zero. At the beginning of each period, the TNC makes an operating decision, a, for the next period. If the TNC operates in the next period, a is one. If the TNC does not operate in the next period, a is zero.

That is, the TNC observes the next period's potential profit (π) and its current operational status (o). It then takes an action (a), whether it should operate in the next period. In consequence, the TNC earns a reward $f(\pi, o, a)$ that depends on the current state of the economic system, the current operational state of the TNC, and the action taken. In addition, an unknown exogenous shock influences the next period's potential profit. The state transition function is (see e.g. Miranda & Fackler, 2002):

$$g(\pi, o, a, \epsilon) \; = \; (h(\pi, \epsilon), a) \tag{2}$$

If the TNC is not operating and decides to enter the international market under consideration, it pays a fixed entry cost, K_{Entry}. Should the TNC be operating in an international market and then decide to exit, there is a shutdown cost of K_{Exit}.

[4] In order to provide a common reference point, the specification of the industry entry-exit model follows closely a simple generic model provided by Miranda & Fackler (2002), ch. 8 and 9.

[5] Time subscripts should be self-explanatory and are therefore omitted in the remainder of the text in order to simplify the exposition.

In all simulations, K_{Entry} was set to 10 and K_{Exit} was set to 5 (the implication of changing these values is discussed below). The reward function is:

$$f(\pi, o, a) = \pi a - K_{Entry}(1 - o)a - K_{Exit}(1 - a)o \quad (3)$$

Estimation of critical levels of short-run profit. The optimal value of the business unit, $V(\pi, o)$, given an observed short-run profit π and operational status o, is estimated by the Bellman equation. We use numerical methods (the collocation method) to approximate the value function $V(\pi, o)$:

$$V(\pi, o) = \max_{a \in \{0,1\}} \{f(\pi, o, a) + \delta E_\epsilon V(h(\pi, \epsilon), a)\} \quad (4)$$

The functions, f(·) and h(·) are given by eq. 2 and 3, δ is the discount rate.[6] Without loss of generality δ was set to 0.99 (additional analyzes show that alternative values provide qualitatively similar results). We extract, by numerical methods, the critical levels of operating profit that maximize the value function (eq. 4). These provide simple criteria for optimal entry and exit. In addition, note that the two components of the value function effectively express the well-known trade-off between exploitation of an immediate reward ($f(\pi, o, a)$) and the exploration associated with expected future gains following the immediate action ($\delta E_\epsilon V(h(\pi, \epsilon), a)$).

The critical profit levels extracted for a particular example of $\sigma = 2.50$, and $\gamma = 0.90$ is shown in Figures 1-3. Figure 1 compares the critical profits levels to alternative levels of discriminating ability in a fallible evaluator, Figure 2 shows the effect of placing a fallible evaluator in a hierarchy, and Figure 3 shows the effect of evaluation in a flat polyarchical structure. Figure 4 then shows the results obtained for this particular example, with $\sigma = 2.50$, and $\gamma = 0.90$. The results for a full range of parameter values are reported in Figures 5a and 5b. The configuration space included a full range of parameter values: $\alpha = 0.01, 0.05, 0.10, 0.50$, $\sigma = 0.50, 1.00, ..., 4.50$, and $\gamma = 0.30, 90$ (additional simulations for $\gamma = 0.10, 0.50$ were conducted to assess robustness). We set entry costs, K_{Entry}, to 10 and shutdown costs, K_{Exit}, to 5 as in Miranda & Fackler (2002). A random draw determines the initial operating status, o, of the business unit.

A business unit optimally operates during the next period if the short run profit for that period is above some level, π_H, and a business unit optimally shuts down if the profit is lower than π_L. Given entry and exit costs, $\pi_L < \pi_H$, and often, π_L is below zero. Once the TNC has accepted that one of its units enters a new market, it is often optimal to continue operating despite negative spells of operating profits.

The estimation of optimal actions provides a useful baseline for assessment of the performance of decision makers with much less information and computational power than required to solve eq. 4. The performance of three types of decision makers are examined. The first type of decision maker is the optimizer who is capable of

[6] In solving for the Bellman equation, the expectation E_ϵ is represented by weighted discrete shocks with std. dev. σ.

finding the optimal decision criteria. Given information about the system's state transition function, the optimizer solves the corresponding Bellman equation. The second type of decision maker is the local searcher who enters if the short-run profit is at least zero and exits if short-run profit is below zero (other cut-off points were examined to assess robustness). The third type of decision maker is the imperfect evaluator (we examine different levels of capability in evaluation as shown in Figure 1).

The TNC uses a flexible organizational form to evaluate market opportunities. Prior to entry, the TNC uses the "sceptical" hierachical form that allows entry only after validation at a number of successive levels. After entry, decisions are delegated; the evaluation team shifts to an "optimistic" polyarchical mode where approval of the market conditions by any one actor is sufficient to stay in the market. Only if everybody in the evaluation team disapproves of the market conditions, will the TNC exit.

Results. We compare performance of the three types of decision makers in a "horse-race" over 1000 periods. On the basis of 1000 samples, we find that optimizers always outperform local searchers and *single* fallible evaluators.[7] Generally, local searchers who are perfect evaluators using a wrong decision rule (critical profit level of $\pi = 0$, both in the case of entry and exit) also outperform single fallible evaluators. The single fallible evaluator does not perform well because it tends to promote frequent (costly) reversals of prior decisions. Since entry and exit, in each case, is associated with a non-recoverable cost, too many costly mistakes get made.

The disadvantage of the local searcher and the single fallible evaluator is further accentuated in a turbulent environment. With higher turbulence, the optimal entry level of short-run profit increases and the optimal exit level of short-run profit decreases; the range between the values of short run profit that are optimal for entry and exit widens (holding entry and exit costs constant). With the local searcher, the critical entry and exit values thus move further away from zero, which translates into a performance loss. The case of evaluators with high ability (e.g. $\alpha = 0.50$ in Figure 1) is similar to the case of the local searcher; the critical entry and exit values move further away from the values that this decision maker applies. However, in the case of the fallible evaluator with low ability (e.g. $\alpha = 0.10$ or lower), the critical entry and exit values span a wider range in which reversals of prior decisions can occur (see Figure 1).

The performance of the local searcher shown in Figure 4 is markedly higher than the performance of the single fallible decision maker. Note however that two fallible decision makers placed in a flexible evaluation team almost do as well as the individual local searcher. As more decision makers are added to the team, the quality of the decisions further improve until it comprises ten members. As further members are added, however, there is a marginal decline in performance.

[7] As described below in the text, all results reported here were confirmed through comprehensive additional tests.

– FIGURE 4 –

The critical values of short run profit used in the simulation reported in Figure 4 are those shown in Figures 1-3. Considering Figure 2, the effect of adding members to the hierarchical evaluation team used to evaluate entry is to push a portion of the the screening function to the south-east of the critical entry value. Adding members implies that the screening function of the evaluation team begins to approximate the optimal entry level. At some point, however, the screening function is pushed too far to the east, beyond the optimal level. In Figure 2, this is clearly the case with 100 members. As shown in Figure 3, the exit case is perfectly symmetrical to the case of entry. By switching between the hierarchy when entry opportunities are evaluated and the flat, polyarchy when exit options are considered, a team of fallible evaluators can approximate, at least to some degree, the two optimal values of entry and exit.

Rather surprisingly, and consistent with the conjectures made in the literature (Bartlett & Ghoshal, 1998; Child & McGrath, 2001; Lewin & Volberda, 1999; Volberda, 1996, 1998), it turns out that that flexible evaluation structures can dramatically improve the performance of the fallible evaluator. Remarkably, we show that TNCs employing flexible teams of fallible evaluators can obtain profits at the level of the optimizer. We find that this result is obtained if the TNC uses a hierarchy prior to entry and then switches to a flat polyarchical structure after its business unit has entered the international market. Unless the evaluators use too sharp criteria (misguided high ability), the levels of performance obtained in flexible teams of evaluators can asymptote the optimal level (obtained by solution of the Bellman equation).

– FIGURE 5a –

– FIGURE 5b –

Considering the results shown in Figures 5a and 5b, it is remarkable that a team of fallible agents generally outperforms a single fallible evaluator. Moreover, the gain in performance occurs for very moderate team sizes of about five members. Using teams of five in the way described here, rather than relying on single evaluators, will generally lead to improved decisions. When evaluators are highly fallible in assessing market conditions (e.g. because of poorly educated employees or fundamentally uncertain market conditions), Panel 1 in Figures 5a and 5b shows that the number of team members becomes very critical. By contrast, when evaluators have high ability (low fallibility) in assessing market conditions, using a team of evaluators does not help much (Panel 4). This result is reproduced also in additional simulations ($\gamma = 0.10, 0.50$) that were conducted to assess robustness.

Comparing teams of fallible evaluators with the results from two optimal values of entry and exit, we found very modest differences in performance for low to medium levels of ability ($\alpha = 0.05, 0.10$). Only if ability was very high ($\alpha = 0.50$) or very low ($\alpha = 0.01$), did the optimal evaluator have great advantage. The local searcher, by contrast, was always at a great disadvantage because a single critical level was used to determine both entry and exit.

Additional tests for robustness were conducted. They included local searchers using either the positive or the negative optimal value of entry and exit. Also in this case, the local searcher remains at a disadvantage under significant entry and exit costs. Because of significant entry and exit costs, two critical levels must be used (one for entry and a different for exit). The local searcher is only capable of using a single identical point, but two points must be used to approach optimal levels of performance. We have identified two strategies that can be used to accomplish this. The first is the unrealistic addition of computational power that characterize the optimizer. The second, by contrast, is the use of flexible evaluation teams to help fallible agents accomplish what any single imperfect agent is incapable of. Notably, this conclusion only holds when agents are not entirely rigid in their evaluation of alternatives. As previously mentioned, the perfect discrimination of local searchers (Cyert & March, 1963; Lant & Mezias, 1990) is a rigidity that cannot be overcome (Christensen & Knudsen, 2004; Knudsen & Levinthal, 2005). Flexible evaluation teams can only help fallible discriminators (a measure of flexibility at the individual level).

4 Conclusion

The present article contributes by anchoring in a generic and commonly accepted modeling structure the insights gained in numerous empirical studies. The results obtained in the present study suggest that flexible organizations can be designed to respond to the twin pressures of exploitation and exploration. This is broadly in accord with recent empirical findings that TNCs experiment with flexible organizational structures in response to increased levels of turbulence and uncertainty in international markets.

A further issue concerns the level of entry and exit costs. Only if there are significant entry and exit costs, will there be an advantage in using flexible organizational structures in evaluation. As entry and exit costs go to zero, the level of short-term profits at which both entry and exit is optimal approaches zero. In that case myopic, local searchers that are capable of perfect discrimination of market opportunities would do as well as the optimizer, and both of these types of agents would outperform fallible evaluators.

There is no reason to believe that a single agent would also be a perfect discriminator, however. Therefore, fallible agents could benefit from being organized in teams even if entry and exit costs go to zero. The structures that would lead to the highest performance levels would be stable (rather than flexible) teams that helped increase the discriminatory power around zero. Thus, fallible evaluators could gain from being located in stable organization structures when entry and exit costs are low. In contrast, flexible organization structures benefit fallible evaluators when there are high entry and exit costs – and the gain is the highest when the ability to assess market opportunities is rather modest. The present results also lead us to expect that it is the added uncertainty in assessing market opportunities rather than increased turbulence, which accounts for a possible advantage of using flexible organizational structures in evaluation. These are examples of testable propositions that can be drawn from the present study.

The implications for research are fairly straightforward. We need empirical research that can examine the relation between evaluation structures (or voting rules) and the quality of the decisions that get made. Recent studies of entry and exit decisions in response to uncertainty in international markets (Delios & Henisz, 2003; Kogut & Singh, 1988; Reuer, 2000) have found that TNCs are increasingly pursuing an international expansion strategy in uncertain policy environments. This implies that decisions concern environments in which market opportunities are notoriously hard to evaluate. It would therefore be important to understand how evaluation structures are used. Are decisions made by single evaluators or teams of evaluators when TNCs make entry and exit decisions (and other critical decisions)? What are their characteristics (size, flexibility, flows of decisions) and how do these characteristics impact the quality of the decisions that get made? Implications for practitioners can be drawn along similar lines. It is generally important to involve more evaluators in critical decisions (such as entry and exit decisions in TNCs), however, the way teams are best organized is contingent upon a number of factors (as outlined in the above).

The many studies of TNCs and MNCs, including those on entry and exit decisions, have given the role of evaluation structures scant attention. This is surprising since many decisions are made in groups (such as boards, top management teams, and ad hoc committees). An early experiment by Birnberg, Pondy & Davis (1970) examined the effect of voting rules in stable evaluation structures and found, in accord with general predictions, that a simple majority rule outperformed unanimity (equivalent to hierarchy) and veto (equivalent to polyarchy). However, we have very little knowledge about the actual voting rules, and evaluation structures, used in TNCs. More generally, the study of evaluation in (business) organizations is an important but rather neglected topic (Knudsen & Levinthal, 2005).

There is much prior research on entry and exit decisions in TNCs and MNCs, including prior studies on the evaluation of foreign opportunities (Cavusgil, Kiyak & Yeniyurt 2004; Schooler, 1974). These have developed useful general frameworks for the assessment of market attractiveness and risk, but we lack evidence on how such market choices actually happen and in what way evaluation teams are used. Thus, systematic research is needed to fill this gap in our knowledge. The present study aims to direct attention to the role of teams in TNCs evaluation of market opportunities. To help stimulate further research on this important topic, we have developed a modeling structure from which testable propositions can be drawn. More generally, we hope this helps stimulate the use of rigorous modeling in the study of international business without loss of practical relevance. Further advances along such a path can help both managers and researchers navigate on the basis of a more secure footing.

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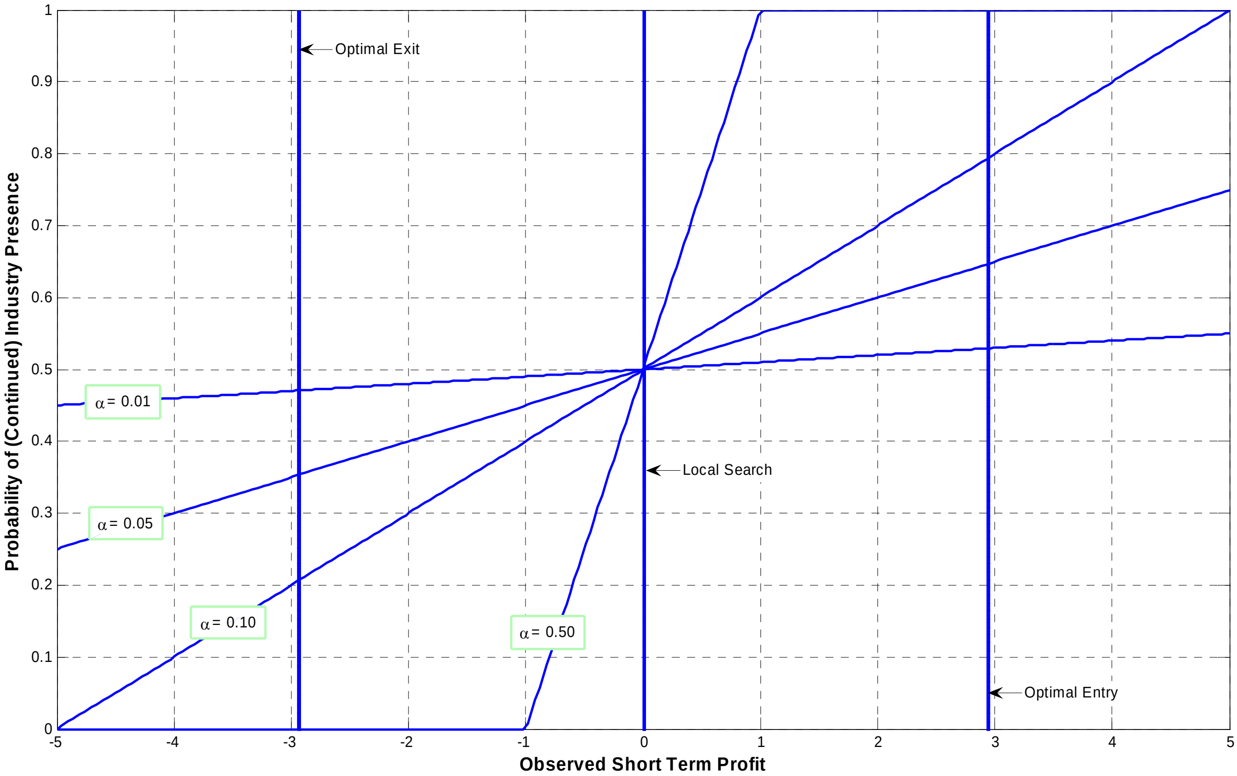

Figure 1: Levels of ability of fallible evaluator (α= 0.01, 0.05, 0.10, 0.50), local search (α →∞) and critical profit levels for optimal entry and exit. Critical profit levels shown for σ= 2.5, γ= 0.90, K_{Exit}=10, K_{Entry}=5.

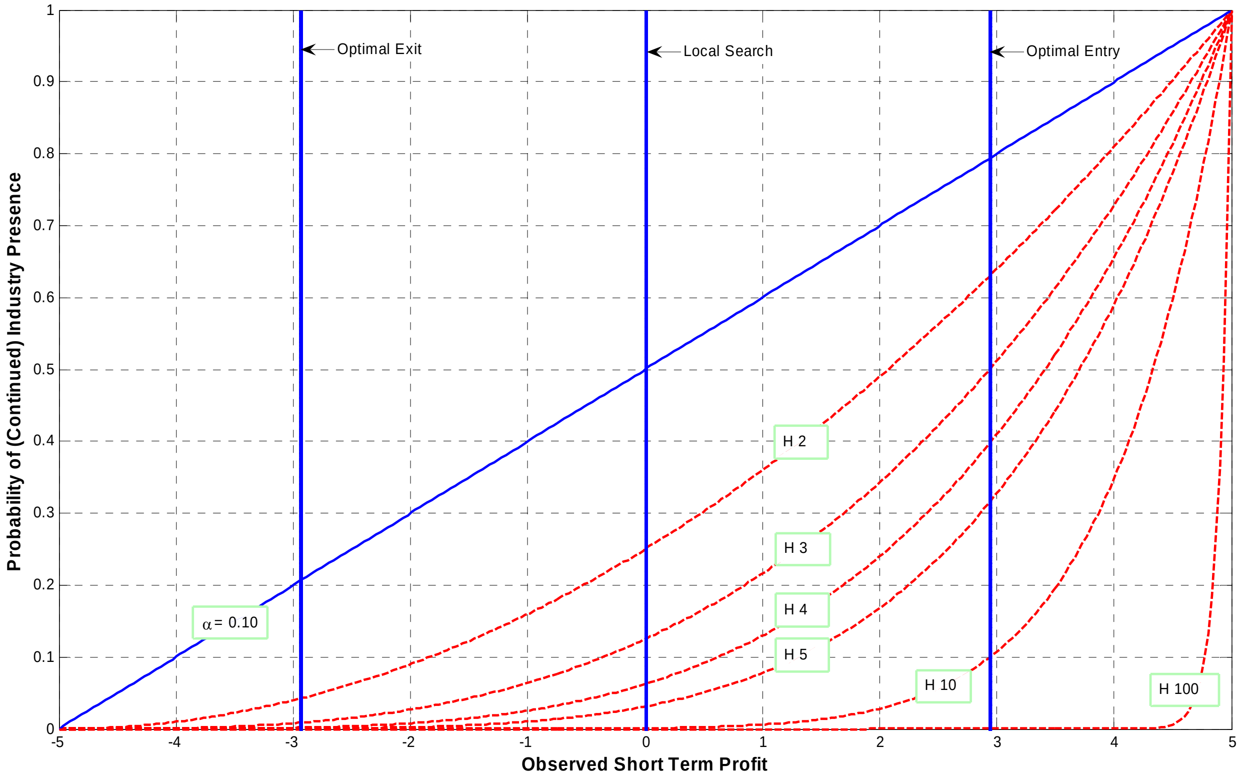

Figure 2: Levels of ability of hierarchical evaluation teams with two or more fallible members (example illustrates teams with 2, 3, 4, 5, 10, and 100 fallible member and ability, α= 0.10). Critical profit levels shown for σ= 2.5, γ= 0.90, K_{Exit}=10, K_{Entry}=5.

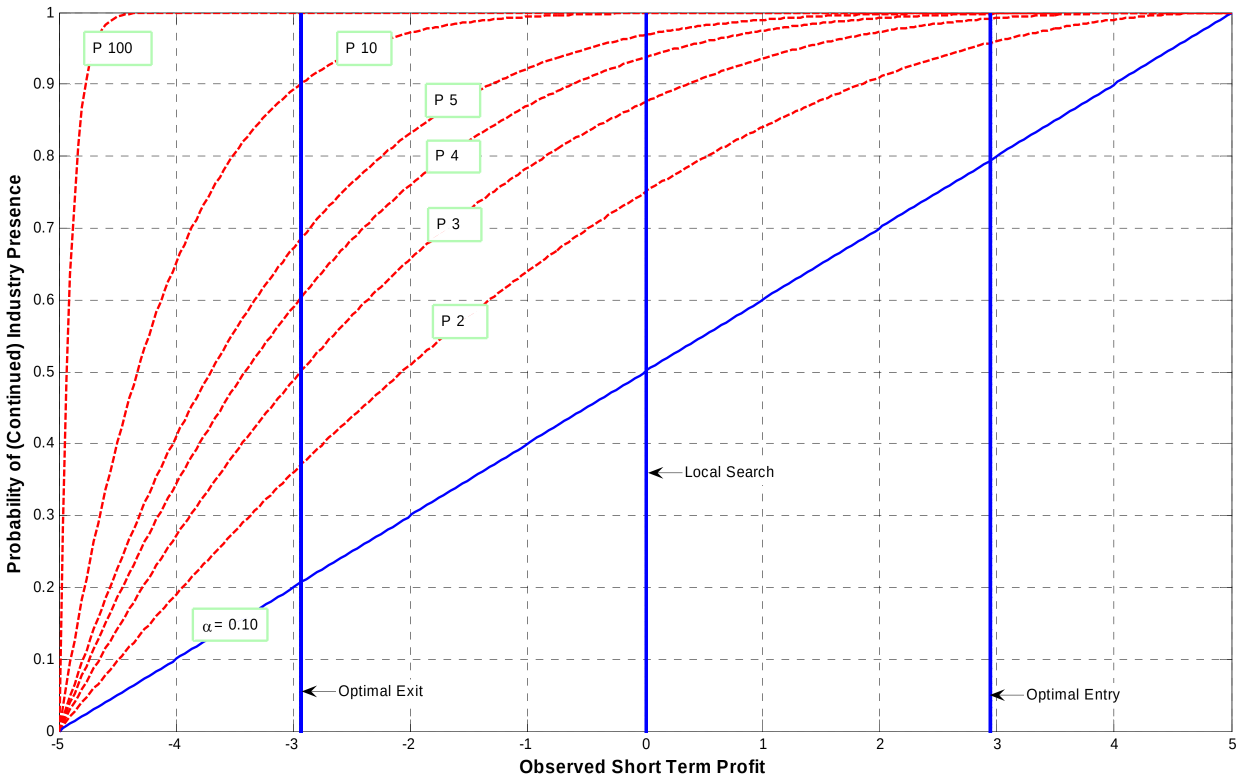

Figure 3: Levels of ability of flat, polyarchical evaluation teams with two or more fallible members (example illustrates teams with 2, 3, 4, 5, 10, and 100 fallible member and ability, α= 0.10). Critical profit levels shown for σ= 2.5, γ= 0.90, K_{Exit}=10, K_{Entry}=5.

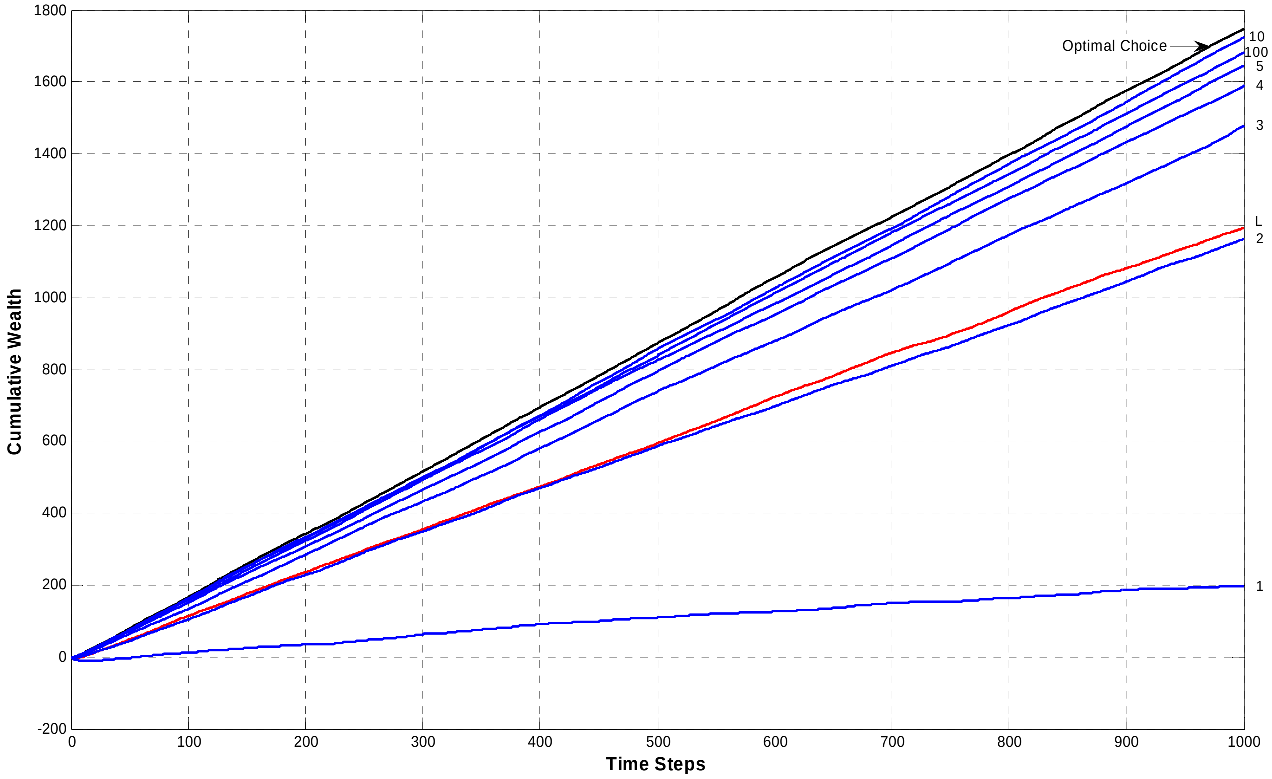

Figure 4: Performance of the optimizer, the local searcher and a single fallible evaluator (α= 0.10), compared with the performance of flexible evaluation teams with two or more fallible members (example illustrates teams with 2, 3, 4, 5, 10, and 100 fallible member and ability, α= 0.10). Example for σ= 2.5, γ= 0.90, K_{Exit}=10, K_{Entry}=5.

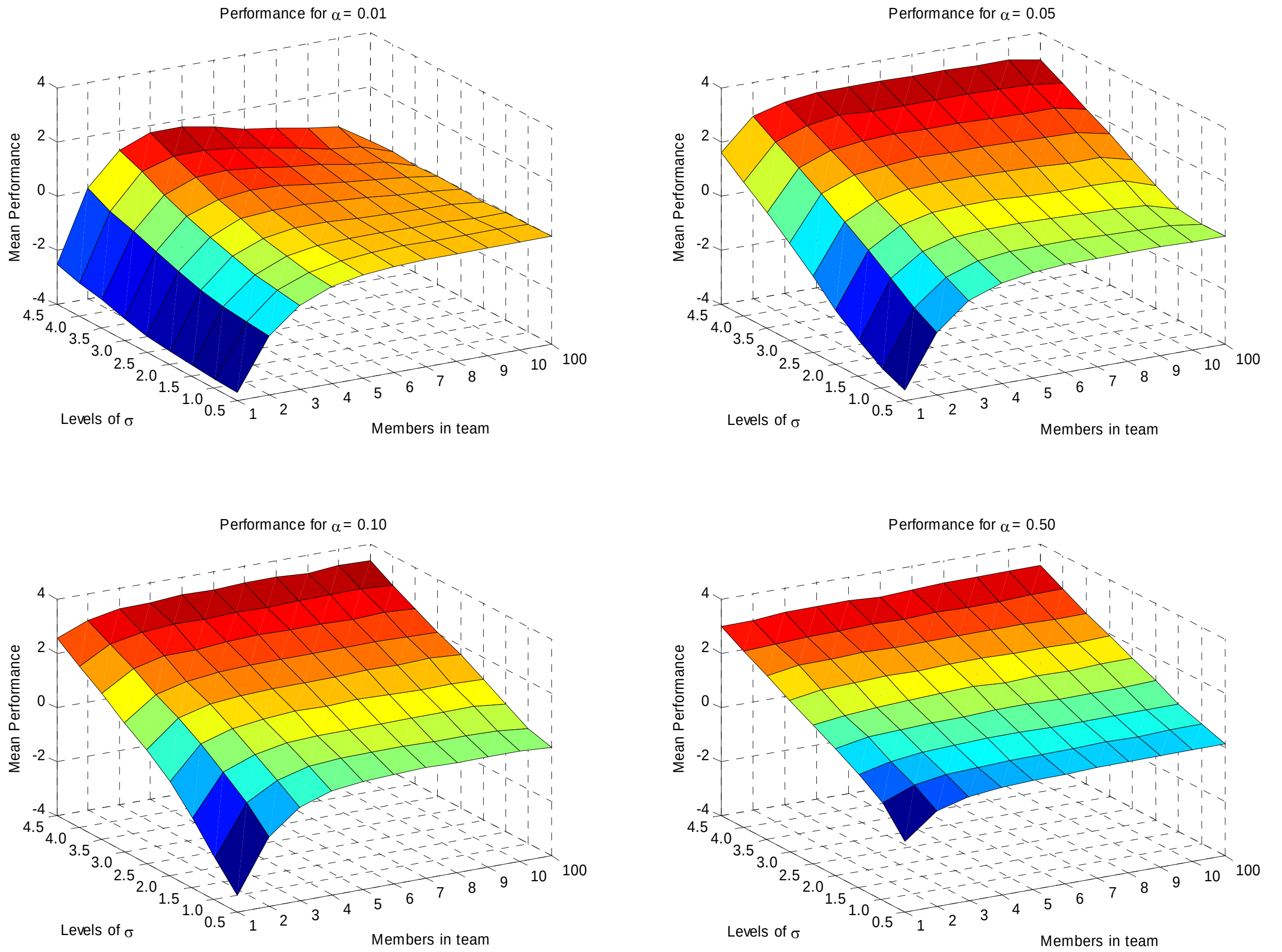

Figure 5a: Performance of a single fallible evaluator (α= 0.01, 0.05, 0.10, 0.50), compared with the performance of flexible evaluation teams with two or more fallible members. Results obtained for γ= 0.90, σ= 0.5, 1.0, …4.5, and teams with 1, 2, …, 10, and 100 fallible members. Based on 1000 samples for each point in the configuration space.

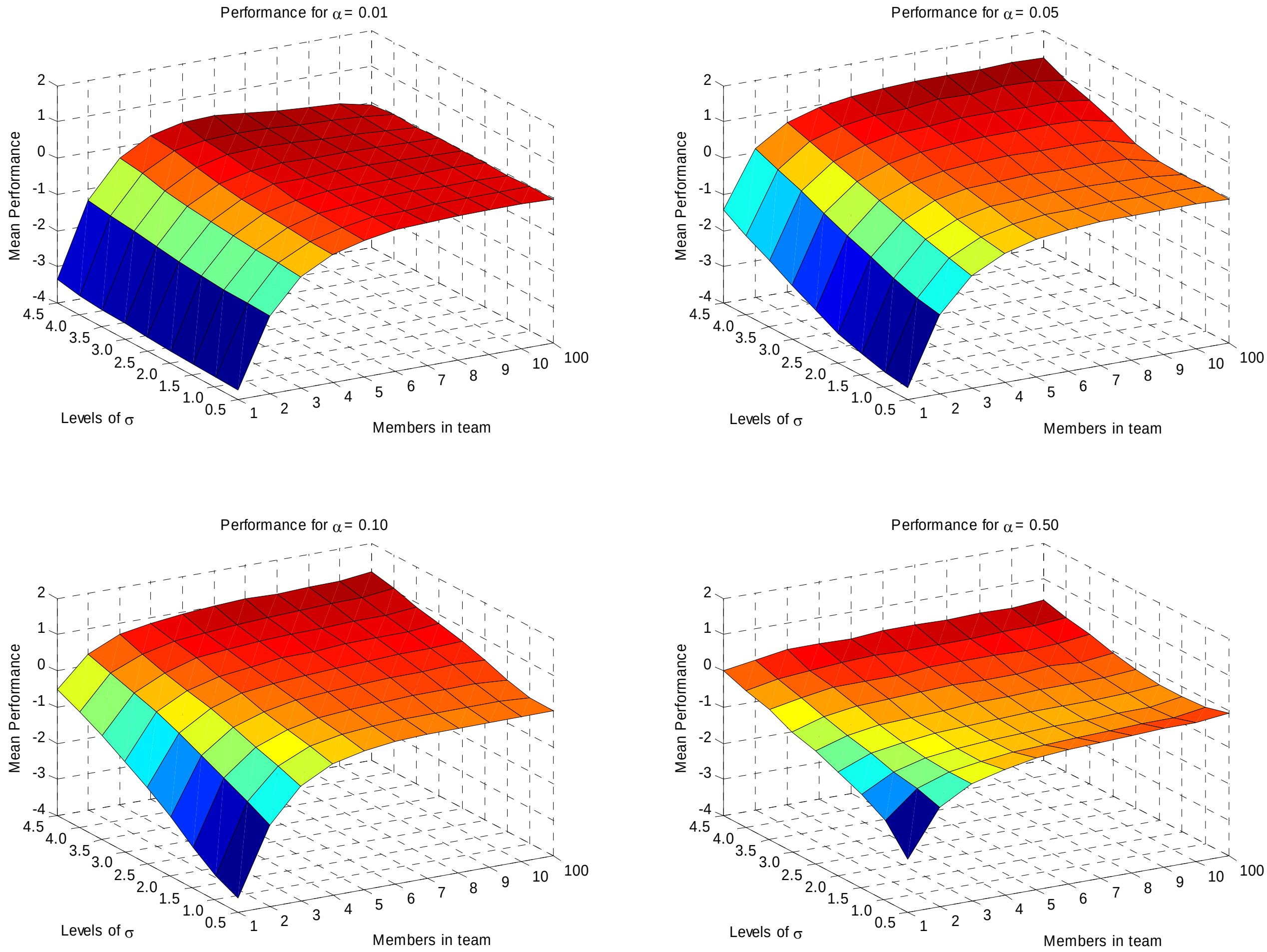

Figure 5b: Performance of a single fallible evaluator (α= 0.01, 0.05, 0.10, 0.50), compared with the performance of flexible evaluation teams with two or more fallible members. Results obtained for γ= 0.30, σ= 0.5, 1.0, …4.5, and teams with 1, 2, …, 10, and 100 fallible members. Based on 1000 samples for each point in the configuration space.