INTERDEPENDENT GOVERNANCE MECHANISMS AND PERFORMANCE FEEDBACK IN STRATEGIC ALLIANCES

ABSTRACT

We develop a more integrative view on alliance governance dynamics, using a system dynamics approach. We suggest that studying dynamic interdependencies between formal mechanisms and trust as well as understanding related performance implications requires a better understanding of the interplay of (1) behavioral dynamics related to perceptions of opportunism and missed performance expectations, and (2) learning outcomes related to the use of formal governance, for example monitoring. This allows building up discernment capabilities, which help distinguishing between opportunistic behavior and external factors when performance shortfalls occur. Due to this learning effect, alliance partners can avoid overreactions in governance adaptations and eventually achieve trust and performance gains. Furthermore, our study shows how the debate on alliance governance dynamics can fruitfully benefit from an introduction of simulation techniques.

Key words: Alliances, Governance mechanisms, Trust, System Dynamics, Computational strategy.

INTRODUCTION

In the past decades, engaging in strategic alliances has become an increasingly popular strategy for firms. Despite of the growing number of alliances, research continuously reports dissatisfaction with alliance performance and failure rates of more than 50% (e.g. Das and Teng, 2000; Ireland et al., 2002; Khanna et al., 1998; Kogut, 1989; Park and Ungson, 2001). An essential characteristic of strategic alliances is the mutual dependence between formerly independent organizations. This makes it necessary for firms to deal with coordination problems and with uncertainties not only relating to the external environment, but the potentially opportunistic behavior of the partners – all of which can significantly impact the performance of alliances (Harrigan, 1985; Krishnan, Martin and Noorderhaven, 2006). As a consequence, literature has established a significant interest in studying the governance architecture for safeguarding alliances, with formal and relational, trust-based mechanisms interdependently coexisting (e.g. Dekker, 2004; Poppo and Zenger, 2002).

In recent years, literature on alliance governance has made substantial progress in understanding the interdependencies between formal and trust-based, relational mechanisms, particularly with respect to either a substitutive or complementary relationship (Corts and Singh, 2004; Dekker, 2004; Lazzarini, Miller, and Zenger, 2004; Luo, 2002; Poppo and Zenger, 2002; Woolthuis, Hillebrand, and Nooteboom, 2005). Furthermore, there is agreement in literature that over time alliance governance adaptations happen (e.g. Reuer et al., 2002). They are simply needed due to a lack of experience of emerging tasks, evolving opportunities, and mistakes during ex-ante design and implementation stages. Thus, partners might engage in contract negotiations (Ariño et al., 2008) and adapt the set of formal governance mechanisms. Also, literature on inter-

organizational trust points to the dynamic processes involved when trust is tracked and developed in inter-firm relationships (e.g., Poppo et al., 2008; Ring and van den Ven, 1992, 1994; Uzzi, 1997). The evolution of trust during the alliance activities heavily depends on fulfilling expectations about each other which makes dynamics an inherent component of trust and relational governance (Poppo et al., 2008; similarly Ariño and de la Torre (1998) who point to dynamic effects of cooperation). As a result, if partner's behavior or performance differ from expectations, trust and the willingness to rely on relational governance might increase or decrease over time and/or decisions about adaptions of formal governance might be taken.

Despite of these valuable efforts in literature of understanding interdependencies between different kinds of governance mechanisms as well as of investigating ex post governance alterations, we have only a limited knowledge of dynamic processes underlying such interdependencies. Literature to date offers important insights on potential interdependencies between formal governance and trust, but still we do not know much about how dynamically deliberate or undeliberate decisions on one governance choice impact the other one, leave alone what this means for the benefit of the alliance. Two shortcomings in the received literature are of particular importance, when dynamic effects are considered.

First, from a theoretical standpoint, literature tends to discuss interdependencies between formal governance and trust in an "isolated" way. Put it differently, research tends to look at the effect of the complexity of formal governance on the level of trust and vice versa, with arguments for a substitutive or complementary relationship between them (for an excellent summary see Puranam and Vanneste, 2009). However, to our best knowledge, prior work ignores two important theoretical considerations: on the one hand,

behavioral dynamics related to performance expectations and perceived opportunism, which trigger governance alterations and reactions on trust, on the other hand the effect of learning connected to formal governance, which helps understanding the noise behind performance shortfalls, arguably avoiding overreactions in formal governance and trust adaptations. Second, from a methodological perspective, alliance literature interested in any interdependencies between different kind of governance mechanisms and potential dynamics involved tends to mainly apply cross-sectional design (e.g. Hoetker and Mellewigt, 2009; Poppo and Zenger, 2002), case studies (Dekker, 2004; Faems, et al., 2008; Neumann, 2010) or conceptual/analytical approaches (e.g. Puranam and Vanneste, 2009; Das and Teng, 2002). These studies offer important insights, but they can only be a first step in understanding the dynamic processes involved. We propose that simulation model techniques might be particularly beneficial for understanding the dynamic interactions between behavioral dynamics, governance alterations and performance over time. Simulation modeling has yet been more slowly applied in management, organizational and strategy research than in other disciplines, despite its powerful methodologic approach for advancing theory building (Harrison et al., 2007; Sastry, 1997). Applied in alliance governance research, this technique allows to show how adaptation decisions about certain mechanisms impact other mechanisms, how such decisions are tracked over time, and which performance effects are likely to occur.

To summarize, by applying system dynamics modeling, this paper is an attempt to contribute to literature on alliance governance dynamics by introducing the interplay between behavioral dynamics and learning, which is likely to affect, in a dynamic perspective, governance adjustments, trust levels, and ultimately alliance performance.

Our paper proceeds as follows. In the next section we present the theoretical background by discussing governance in alliances and the role of behavioral dynamics and learning as introduced above. Thereafter, we present our model, which is designed to simulate (1) the precise interactions between trust, formal governance and performance, when behavioral dynamics are considered, and (2) the implications of learning through formal governance for trust and performance. This section closes with four propositions which guide the implementation of governance in alliances. Finally, we discuss the findings that emerge from this model, their implications and potential extensions.

THEORETICAL BACKGROUND

The governance of inter-firm alliances consists of formal mechanisms and relational mechanisms (e.g. Dekker, 2004; Hoetker and Mellewigt, 2009; Poppo and Zenger, 2002; Puranam and Vanneste, 2009). Formal governance is defined as the set of structural mechanisms to safeguard the alliance (ibid.), often written down in a formal contract and, thus, perceived as legally binding (Faems, et al., 2009). Relational governance refers to the relational processes underlying inter-organizational relationships with trust between the parties as the central component involved. Trust is defined as the expectation that an exchange partner will not behave opportunistically, even when such behavior cannot be detected by the victim (Mayer et al., 1995).

Literature on alliance governance grounded in transaction cost economics (TCE, e.g. Williamson, 1991) focuses primarily on the role of formal governance, which is based on a formal contract implemented by the partners in an alliance. The main argument is that as exchange hazards due to opportunism exist, formal governance mechanisms will

be needed to help mitigate those hazards. Moreover, formal governance has also been considered helpful for coordinating issues among alliance partners (e.g. Mayer and Argyres, 2004; Gulati and Singh, 1998). Subsequently, TCE and organizational economics in a broader sense introduce, as being part of alliance governance, relational mechanisms, which are routed in familiarity and trust (Gulati, 1995) as beneficial for reducing opportunism (e.g. Williamson, 1993), joining the sociology-based literature on the benefits of trust for coordination and opportunism mitigation (e.g. Ring and Van de Ven, 1992, 1994; Rousseau et al., 1998). Both kinds of governance coexist in alliances. However, there are different opinions in literature whether the relationship between them is rather complementary or substitutive (e.g. Gulati, 1995; Lazzarini, Miller, and Zenger, 2004; Luo, 2002; Poppo and Zenger, 2002; Woolthuis, Hillebrand, and Nooteboom, 2005). There are good arguments for both logics. For example, a complementary relationship can be argued based on an organizational economics reasoning. As contracts are by definition always incomplete leaving room for behavioral uncertainty, a sound formal governance can help to make the contract "more" complete, which reduces the opportunities for exercising opportunism. This in turn might encourage partners to develop trust and rely on relational mechanisms (e.g. Poppo and Zenger, 2002). On the other hand, a substitutive relationship is similarly reasonable. An extensive formal governance structure usually indicates in a detailed and comprehensive way how and what to monitor, which contributions the partners have to make and what happens if the partners fail to do so. This can be perceived as a signal of distrust with negative effects on the willingness to build trust in the future (e.g. Gulati, 1995).

All these studies convey individual, important insights, but "cumulatively also suggest a bewildering array of possible relationships between trust and governance, at

least some of which appear incompatible with one another" (Puranam and Vanneste, 2009: 11). Particularly, taking a dynamic perspective, it is not clear how such potential interdependencies are tracked and how they might affect the alliance benefit in the long run. Strategic alliances are subject to evolutionary processes, which are influenced by a specific order of events and interaction between the partners (Doz, 1996; Ring and Van de Ven, 1994). For example, Ariño and de la Torre (1998) found that emerging concerns regarding efficiency and equity shares trigger adaptation processes in alliances. Also, research points to specific alliance characteristics (Reuer and Ariño, 2002; Reuer et al., 2002) and initial governance misalignments (Ariño et al., 2008), which enhance the likelihood of governance or contractual adjustments.

Yet, literature has emphasized alliance dynamics as a critical element for the success of alliances (Das and Teng, 2000; Ring and Van de Ven, 1994), but is only about to begin connecting dynamically governance interdependencies and related performance effects. Particularly, two theoretical considerations have received less attention in literature on alliance governance dynamics, which we suggest adding to the discussion. On the one hand, there are behavioral dynamics related to performance expectations and perceived opportunism. On the other hand, learning effects occur, gained through the use of formal governance. We propose that the interplay between these two factors might enhance our understanding of governance dynamics and related performance effects.

Behavioral dynamics

Behavioral dynamics related to perceptions of opportunism and performance expectations is an important factor which triggers formal governance alterations and (undeliberate) changes in trust in a dynamic perspective. Behavioral dynamics appear when we carefully disentangle real opportunism and perceived opportunism as well as alliance performance and performance expectations. It is the perception gap, on the part of managers involved in the alliance, between expectations and actual results, which induces risks of failure to be dealt with (Ariño and Doz, 2000). Usually, if performance does not meet expectations, partners tend to *perceive* opportunism at the side of the partner as a potential source of the performance shortfall and react with changes in trust and governance alterations. One reasonable reaction is to rise formal governance complexity, by e.g. increasing representation in alliance boards, transferring additional personnel to the partner organization or enhancing the frequency and/or scope of monitoring (Reuer et al., 2002). At the same time, performance shortfalls also negatively affect the level of trust, as keeping and developing trust depends on fulfilled expectations about each other's commitment to the alliance and behavior (Poppo et al., 2008). The logic behind these reactions is that performance shortfalls can be caused by either exogenous or by endogenous factors linked to potentially opportunistic behavior of the partner, however, it is difficult to disentangle (Ariño and Doz, 2000). Thus, as opportunism *might* be the cause, performance shortfalls relative to expectations triggers the perception of opportunism at the partner's side (which might differ from the level of real opportunism), leading at the same time to both, a decline in trust and efforts to enhance formal governance. Moreover, under the assumption of a substitutive relationship between formal governance and trust (Ring and Van de Ven, 1994; Mayer et

al., 1995; Puranam and Vanneste, 2009), the governance related reaction would cause a further decline of trust, with negative alliance performance effects. However, the level of perceived opportunism might differ from real opportunism, simply due to external factors causing noise. Thus, alliance partners' attitude of trust and governance reactions might not always be appropriate, which, ceteris paribus, might negatively affect the benefit of the alliance – either through excessively reduced levels of trust or additional costs caused by the additional (but unnecessary) implementation of formal governance.

Learning through formal governance

What happens, when we introduce the notion of learning, connected to the use of formal governance mechanisms? Indeed, literature points to different types of learning. For example, formal governance mechanisms can serve as a coordination device (Gulati and Singh, 1998), which helps encoding common knowledge and learning over time, like learning how to contract (Mayer and Argyres, 2004). More importantly for this paper is the fact that using and applying formal governance enables partners to develop discernment capabilities as they learn to distinguish real opportunistic behavior from external factors. This is particularly intuitive when monitoring as an important component of formal governance[1] is considered. Monitoring in alliances includes all formal mechanisms which allow the alliance partners to collect information about a certain degree or level of alliance output and partner behavior. Examples include the implementation of alliance boards, the transfer of own personnel to the partner, and the use and exchange of business plans, balance sheets, performance indices, profit and loss

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[1] Formal governance can be broadly categorized into monitoring mechanisms and the degree of incentive alignment (Williamson, 2002).

accounts, internal prices, economic efficiency calculations, reports, and service level agreements, etc. (e.g. Hoetker and Mellewigt, 2009). Received literature argues that the use of governance leads to efficient outcomes. It allows verifying information related to the transactions in a way that partners can ascertain the degree to which each has taken actions that align with contractual terms, as well as understand and allocate the responsibility for performance shortfalls (Williamson, 1985; Greif, 2005). Over time, partners accumulate through such learning processes discernment capabilities, which help reducing the gap between real and perceived opportunism. This should allow for a more precise detection of the causes behind the performance shortfall. This, in turn, should safeguard the alliance from partners' overreactions with regard to governance alterations and trust declines. Put it differently, it allows making governance alterations more precise and has, at the same time, positive effects on performance and trust.

THE MODEL

We build on the conceptual reasoning and analytical model developed by Puranam and Vanneste (2009), which reflects several, well established assumptions in literature on interdependencies between trust and governance in alliances. The authors distinguish between ex ante and ex post trust, the complexity of formal governance (which causes governance costs) and the benefits of exchange. First, in t=0 a given formal governance decision has been made and a given level of trust[2] exists. Thus, both governance mechanisms co-exist in alliances. Second, both kinds of mechanisms positively impact

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[2] The origin of trust is not relevant for the scope of this paper, be it from past interactions as put forward in the literature based in a more sociological tradition of trust (shadow of the past) or be it from the expectation of future benefits as argued in the relational governance/ contract literature (shadow of the future).

alliance performance. Third, the authors distinguish between ex ante and ex post trust, with ex ante trust positively impacts the development of ex post trust which in turn enhances the benefits of exchange. Fourth, the model implies a substitutive relationship between trust and formal governance.[3] More precisely, formal governance is seen not only as negatively impacting the level of ex post trust, but also the relationship between ex ante and ex post trust.[4]

The simulation model includes equations that govern the behavior of a number of state variables. Standard continuous-time notation represents differential equations to describe the behavior of state variables (see Table 1).

The value of the generic state variable (X), at time (t), is the integral of previous changes as follows:

$$X_{t=} \int_{t_0}^{t} \frac{dX}{dt} + X_{t_0}$$

As explained above, we build the model by grounding on the work of Puranam and Vanneste (2009) that formalized the interaction between trust and governance complexity in the course of an alliance. We use the example of monitoring as one important component of formal governance (Williamson, 2002).

The structure of our model is straightforward. We apply formalizations, relying on hypotheses derived from behavioral theory and crystallized into typical System

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[3] As our baseline model builds on the model of Puranam and Vanneste (2009), we assume a substitutive relationship between trust and formal governance. This paper will benefit in its final version from comparing results stemming from alternative assumptions, i.e. modeling additionally a complementary relationship.

[4] The authors argue for different kinds of what they call crowding out effects between formal governance and ex ante and ex post trust. As in the simulation model, trust is a stock variable, which changes over time, we do not distinguish between ex ante and ex post trust, and therefore, do not model these crowding out effects.

Dynamics modeling (Forrester, 1961; Sterman, 2000). There are four stock variables. Two key variables describe the governance that an organization applies: *Trust* (T) and *Monitoring* (M). The stock of *Monitoring* ranges from 0 to 1. Zero means that no monitoring is applied and one means that all the theoretically available mechanisms of monitoring have been implemented. The first stock captures the level of trust accumulated by the partners in the alliance (T). This is the level of *Trust*. The stock variable ranges from 0 to 1. Zero means that there is not trust between parties involved in the alliance and one means that the theoretically possible level of trust has been reached. Whereas Puranam and Vanneste (2009) describe trust using two different concepts: ex-ante and ex-post trust, we interpret the two concepts as the same stock observed in different points in time. More precisely, we suggest that our stock-and-flow modeling elicits and clarifies an implicit confusion between trust as a level, which generates information that are considered in decision making processes, and the pressures that work to change the state of the level. To confirm this interpretation, Puranam and Vanneste propose that trust provides '…basis for exchange' (2009: 12) and '…absent the destruction of trust, ex ante trust will simply be "carried "forward" into the relationship' (2009: 16). That is, trust is an observable state and ex-ante trust is transformed into ex-post trust as time goes by. This encouraged us to model *Trust* as stock. Accumulation of trust is inversely proportional to the level of *Monitoring*. In Purannam and Vanneste this causal relationship accounts for the 'indirect crowding effect' between formal governance (i.e. monitoring) and trust. In addition, accumulation of trust in inversely proportional to the perceived level of opportunism (O^P).

1. $T = \int_{t_0}^{t} \frac{dT}{dt} + T_{t_0}$

2. $\frac{dT}{dt} = \frac{[\vartheta*(1-M)+(1-O^P)*(1-\vartheta)]-T_t}{\tau_T}$

The level of monitoring depends on perceived level of opportunism (O^P). The function (f^M) regulates the level of monitoring reacting to perceived opportunism.

3. $M = \int_{t_0}^{t} \frac{dM}{dt} + M_{t_0}$

4. $\frac{dM}{dt} = f^M(O^P) - M_t$

  The other two stock variables are *Perceived Opportunism* and *Learning*. The first stock captures the level of opportunism as it is perceived by the partners of an alliance. Learning crystallizes the knowledge that is accumulated in the course of applying monitoring. In other words, we assume that, within an alliance, partners learn to capture real opportunism rather than automatically connecting low performances to opportunism.

5. $O_t^P = \int_{t_0}^{t} \frac{dO^P}{dt} + o^P{}_{t_0}$

6. $L_t^P = \int_{t_0}^{t} \frac{dL}{dt} + L_{t_0}$

The level of perceived opportunism is influenced by real opportunism (O), since the more real opportunism the more perceived opportunism, and by π^G, which is the gap between expected and actual performances. What the formulation conveys is that the perception of opportunism is inflated when performances are below expectations. Whether actors in an alliance are able to discriminate between real opportunism and low performances depends, as anticipated in the foregoing, by the level of learning (*L*). The stock of learning ranges from 0 to 1. When it takes the maximum value of one, perceived opportunism will be only determined by real opportunism. As reported in equation (9), accumulation of learning follows the application of monitoring.

7. $\dfrac{dO^P}{dt} = L * O + \pi^G * (1 - L)$

8. $\pi^G = \tilde{\pi} - \pi$

9. $\dfrac{dL}{dt} = \dfrac{M - L_t}{\tau_L}$

Finally, real opportunism (O) depends on the governance mechanisms applied. More precisely, real opportunism is inversely correlated to trust and monitoring. As described in the equation (10), the extent to which real opportunism responds to monitoring or trust is regulated by the weight φ.

10. $O = \varphi * (1 - M) + (1 - \varphi) * (1 - T)$

We used a weighted average of the two terms (φ is the weighting factor and ranges from 0 to 1). As reported in equation (11), in our model, the performance of the alliance is affected by real opportunism and by an exogenous driver that we modeled with the function $\varepsilon = f(t)$

11. $\pi = (1 - O) * \varepsilon$

First set of experiments. We conceive our first set of simulation experiments by building on two assumptions, which are well established in alliance literature: (*i*) the necessary co-existence of formal governance and trust within an alliance (modeled as $1 < \varphi < 1$), and (*ii*) the substitutive relationship between the two ($\vartheta > 0$).[5] Moreover, we run our experiments by assuming an exogenous driver of performance, which characterizes the optimal evolution of performance expectations (the function $\varepsilon = f(t)$ reported in Figure

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[5] There are opposite opinions in literature, particularly grounded in organizational economics, which suggest a complementary relationship between trust and formal governance (e.g. Poppo and Zenger, 2002). As put forward above, we will run a second round of experiments, based on a complementary relationship.

1). The s-shape represents a reasonable expected alliance performance evolution. At the beginning set up costs and difficulties in bringing the joint project to life would cause some negative performance, which is expected to turn after a short initial time window into positive performance gains with relatively high growth rates. After a certain time, the performance growth stabiles at a continuously lower rate. The values of the other parameters used in the simulation, and the initial values of the stocks, are reported in table a.1 in the appendix.

Based on these relatively simple assumptions, under a dynamic perspective the simulation of a performance shortfall (i.e. the mismatch of performance expectations), which triggers the implementation of additional formal governance, produces interesting insights. As a first result, the experiments suggest that as long as formal governance (monitoring) is applied, given $\vartheta > 0$, trust will never reach the theoretically maximum level and, given $1 < \varphi < 1$, some level of real opportunism will ensue. As a result, the alliance fails to reach the optimal performance level, which is potentially possible. This leads to the following proposition:

P1: When performance shortfalls occur, under the assumptions of a co-existence of trust and formal governance and a substitutive relationship, enhancing monitoring will fail to reach optimal alliance performance.

As a second stage, we explored the effect of learning. We assumed that, as formal governance (monitoring) is applied, the partners learn to distinguish between perceived and real opportunism (that is, between O^P and O). For distinguishing different levels of discernment capabilities, we simply simulated three different levels of speed of learning:

month six, month 24, and month 48. The introduction of the learning assumption reveals intriguing results. In particular, as suggested by Figure 2, the faster alliance learns (i.e. the higher the discernment capabilities are), the higher is the performance in the transient adjustment period when the alliance is put in place. More formally, we submit:

P2: The higher the learning effect through formal governance is, the closer the alliance comes to the optimal performance level.

The experiment conveys a central message. At the beginning of the simulation, the performance gap is high (the difference $\tilde{\pi} - \pi$). The lower the learning delay (τ_L), i.e. the more the partners build up discernment capabilities, the lower is the impact of the performance gap (π^G) on perceived opportunism (O^P). In other words, in case a performance shortfall occurs, under high-speed learning assumptions, the actors are not biased towards an opportunism-related interpretation of this shortfall, they have learned how to "read" performance disruptions, which occur during the alliance activities. This results in, comparatively speaking, lower levels of perceived opportunism (see Figure 3) and higher levels of trust (see Figure 4).

On the other hand, when performances begin to accrue to the alliance, high-speed learning advices not to associate reduced gap in performances to a relaxation of formal governance mechanisms (monitoring). As a consequence, partners react more carefully to improving performances keeping levels of monitoring (Figure 5). Thus, discernment

capabilities help avoiding overreaction in governance and trust, when performance shortfalls or improvements occur.[6]

After having detected this key role of learning, we performed a number of experiments in which we simulated different impact of formal governance mechanism in curbing opportunism (we performed as sensitivity analysis varying φ in the range [0,1]). These experiments produced other interesting results that we cannot show due to space limitations.

The introduction of the learning effect linked to the use of monitoring, i.e. the accumulation of discernment capabilities, suggests, as theoretically put forward, that eventually the alliance can reach, under the same assumptions, performance levels which come closer to the optimal level. More specifically, when performance is decreasing, learning 'protects' trust partly from the negative influence a performance shortfall would cause. On the other hand, when performance is increasing, learning 'protects' certain monitoring levels from being reduced due to positive performance conditions. This suggests:

P3: When performance is decreasing, learning supports trust by smoothing the influence of a performance shortfall on perceived opportunism and, as a consequence, on trust.

Interestingly, these results hold also in the opposite direction. The learning effect preserves alliance partners to "forget" about monitoring in good times, which again evens the governance decisions.

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[6] After a threshold, which in our experiments occurs around simulated month 10, the performance shortfall decreases as performance starts to accrue.

P4: When performance is increasing, learning preserves monitoring by smoothing the influence of a performance increase in curbing perceived opportunism and, as a consequence, in reducing monitoring.

Summarizing the result, they suggest that the learning effect we are exploring helps keeping the governance in alliances stable, in positive and negative performance conditions. Therefore, we propose:

P5: Learning produces higher advantages during performances turbulences. In this case, learning leads to smoothing the impact of performance on trust and monitoring.

Insert Figures 1-5 about here

DISCUSSION AND CONCLUSION

Applying simulation modeling and offering a dynamic perspective, this paper offers a first attempt to disentangle the complex interdependencies between trust, formal governance and performance in alliances. The results indicate that the interplay between behavioral dynamics related to perceptions of opportunism and performance expectations as well as learning effects gained through the use of formal governance is important for understanding interdependencies between different mechanisms and their eventual performance effects. Importantly, the simulations reveal that formal governance should not only be considered as having an opportunism-reducing effect and a (potentially eroding) impact on trust. By building up discernment capabilities, which supports managers to better understanding if real opportunism is in play when performance fails to reach expectations, formal governance (here monitoring) helps avoiding governance and trust overreactions, and thus eventually saving alliance performance.

In this perspective, our work highlights a behavioral dimension of governance mechanisms. To the extent they help discriminating between real and perceived opportunism, governance mechanisms produce beneficial effects that go beyond simply curbing opportunism. Rather, in our experiments, the benefits of the process of monitoring augment when it activates a learning process that allow the alliance not to overreact to change in performances.

Our work opens the way for further research at least in two directions. First, we experimented with a new alliance. We simulated the establishment of an alliance from its birth, with unclear perspectives in terms of performances, to its consolidation, with growing and stabilizing performances. Further work ought to explore how mature alliances responds to transient exogenous disturbances. In other words, it would be interesting to explore how governance mechanisms of different nature improve the resilience of an alliance and what the role of learning would be in protecting alliances from exogenous disturbances. A second avenue of research deals with the role of learning. We focused on the role of learning in gauging the activation of formal governance mechanisms on the grounds of real opportunism. Another interesting direction of research could investigate how learning could smooth the crowding effect between monitoring and trust. In terms of our model, in future work, the parameter ϑ could be modeled as endogenous and dependent on learning. It is likely that this assumption will modify our results and illuminate another direction to explore resilience of alliances.

In this light, we suggest that our work conveys important managerial implication. First, when putting in place governance mechanisms, managers ought to remember the learning dimension of monitoring. Second, in the longer term, effectiveness of

governance mechanisms should be judged on their resilience and their ability not to overreact to exogenous stimuli.

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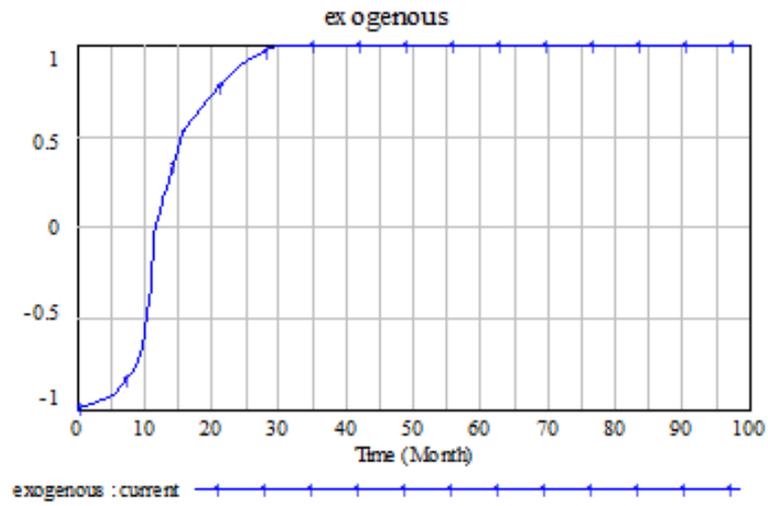
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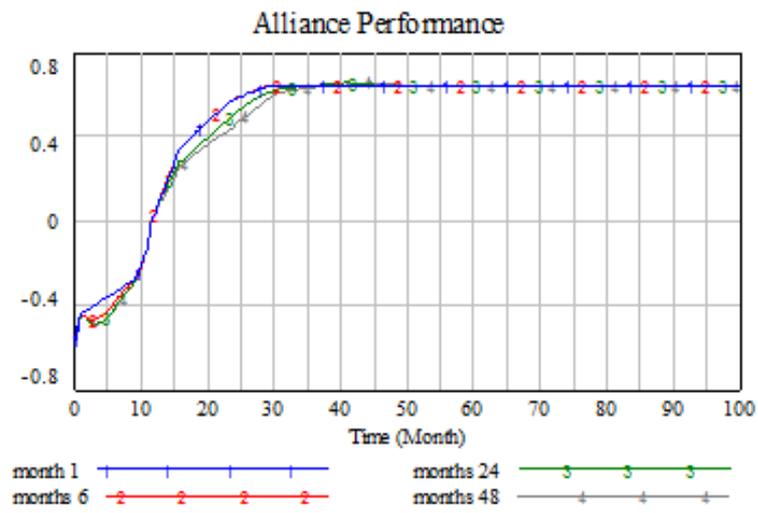
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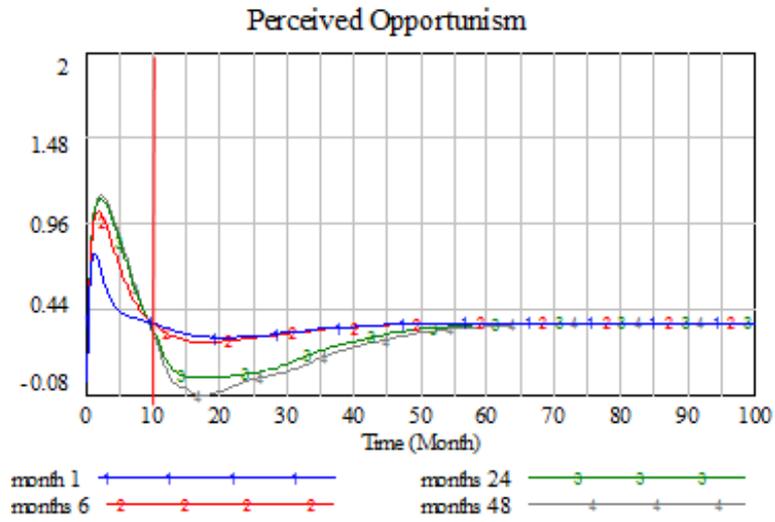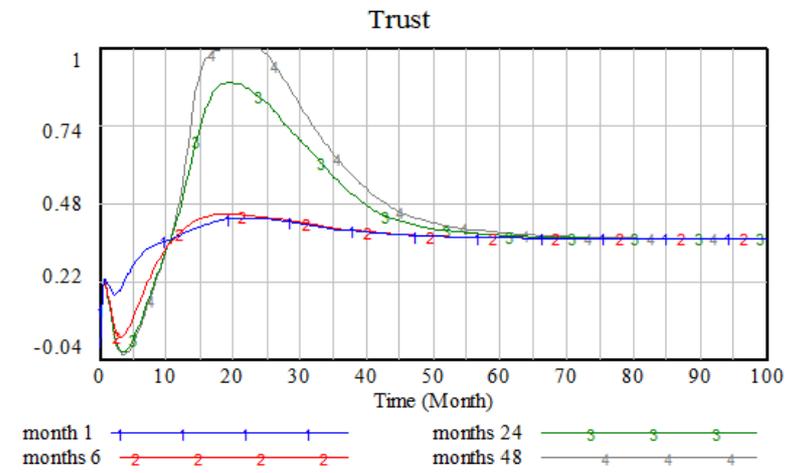
FIGURES

FIGURE 1

exogenous

FIGURE 2

Alliance Performance

FIGURE 3

Perceived Opportunism

month 1	months 24
months 6	months 48

FIGURE 4

Trust

month 1	months 24
months 6	months 48

FIGURE 5

APPENDIX

Table a.1: Model specifications

Parameters	Initial calibration
T= level of trust	0.5
M= level of monitoring	1
L= level of learning	0
O^P=perceived opportunism	0
$\tilde{\pi}$= performance expected	1
ϑ=weight of the effect of monitoring on trust	0.5
φ=weight of monitoring on opportunism reduction	0.5
ε=exogenous driver of performance	scenario
τ_T= time to change accumulated trust	24 months
τ_L=time to learn	36 months