KNOWLEDGE, HIERARCHY AND INCENTIVES:
Why human resource policy and trust matter?

Nathalie Lazaric and Alain Raybaut (*)
CNRS-University of Nice Sophia Antipolis.

Introduction

The co-evolution of incentives and cognitive mechanisms are actually one of the most promising questions for the theory of the firm because “the fact that incentives are not taken into account is a drawback shared by all evolutionary of the firm” (Garrouste and Saussier, 2005). For this reason, knowledge should not simply be understood as a pure cognitive process, but also as a locus in which the political dimension becomes critical. However, formalisation attempts in the evolutionary literature, though interesting, appear to be at their infancy because the dynamics involved are always complex and therefore difficult to integrate (for some exceptions Dosi, Levinthal and Marengo, 2003).

Groups, teams or “communities of practice” play an important part in the creation of knowledge and could be an appropriate organizational design for implementing specific incentives (rewards, bonus ...) (Cohendet and Llerena, 2003). If knowledge creation by such ‘horizontal communities’ may be difficult in the absence of appropriate intervention regulating their creativity (Miles and Snow, 1992; Miles et al. 1997; Foss, 2003); the hierarchy should not be envisaged as pure gendarme or instrument of obedience. According to us, the “organisational loyalty” or the “human docility” should not be considered ex ante as in the Simonian framework (Simon 1951, 1991), nor should individual opportunism be envisaged as the starting point (Williamson, 1991). A counter-argument has been developed showing that the role of hierarchy is to go beyond the solely opportunism is order to give a chance for developing other values like trust: “To some degree, to management roles of

(*) GREDEG 250 rue A. Einstein 06560 Valbonne France.
DEMOS : Organisations, Institutions et Dynamique Economique
Email: lazaric@idefi.cnrs.fr, raybaut@idefi.cnrs.fr
gendarme and educator may conflict with one another. The cultivation of a common corporate culture may require a degree of trust between employee and employer and between employees themselves. However, habits of trust may be undermined by the excessive use of the gendarme role and the presumption by management that employees are potentially opportunistic” (Hodgson, 2004).

In a context of incomplete contract between employer and employees bringing many uncertainties about the content of the work, trust may be crucial: first, for going beyond ambiguities and misinterpretation due to knowledge creation and, second, for reducing the potential gap of skills between employer and employees (Adler 2001, Ferrin and Dirks 2003, Szluzanski et ali 2004, Lazaric and Lorenz 1998, Minkler 1993). The fact that an employer and employees are not sharing the same skills increases the possibility of misunderstandings and fallacious judgments for each part (Demsetz, 1988; Connor and Prahalad, 1996). Organisational rules may generate an adequate frame for trust building by implementing some indicators feeding the hierarchical relation. The salary rules are the most delicate and sensitive ones as we will show in this paper (Livet and Reynaud 1998; Reynaud 1998, 2005).

The paper is organized in the following way. We first briefly discuss issues relating to the motivational context of the firm with the importance of rules and trust. We then develop a model which combines the presence of various rules in a context of diverse designs of knowledge distribution. Our main numerical findings are then presented, leading on to the concluding remarks set out in the final section.

I) The motivational context of the firm : organizational rules and trust issues

1 As Sanford Jacoby (1990, p. 334) reports: “as industrial studies have repeatedly shown, the presumption of innate opportunism is fatal to trust ... It leads to a proliferation of control structures – supervision, rules, and deferred rewards – intended to inhibit opportunism. These create resentment and mistrust among employees, who correctly perceive the controls as expressions of their employer’s distrust”. in (Hodgson Ibid ).
One of the major issues for evolutionary theory is the motivational context and internal context of the firm. Many authors have explored these difficulties by introducing the social dimensions (Coriat and Dosi, 1997; Lazaric and Denis 2005; Lazaric and Raybaut 2005). A peculiar glance on the seminal book of Nelson and Winter (1982) shows that this issue was present with the truce argument introducing the motivational aspects of routines for explaining the stability of the organization. If routines are not stabilized with permanent conflicts between organizational members, coordination could not be achieved effectively. This argument is not fully developed, leading to the conclusion that the main goal of the firm was the building of a collection of specific capabilities, either technological or organizational ones.

In a prior work, we have developed this perspective depicting the importance of truce and conflicts with the ability of different organizational set-ups to cope the political dimension for increasing their performance. We built a model of internal selection of routines based on the interplay of the cognitive and political dimensions (Lazaric and Raybaut 2005). Two political configurations, truce and conflict, were considered in set-ups displaying different degrees of hierarchical pressure on knowledge creation and learning. Numerical simulations showed how the strictness of the hierarchy is decisive in the selection of routines in these two opposed political configurations. Selection was crucial in the presence of conflicts, since it has a counterbalancing effect in a chaotic context. In the case of conflict, hierarchy has attempted to impose order and re-establish coherence, a fact that restored the level of profitability. This result did not of course mean that hierarchy and leadership are generally essential to knowledge creation, but simply that some conflicts might discourage motivation and learning, as it has been suggested elsewhere (Foss, 2003). The results of our model highlighted that in the presence of a truce, the co-evolution of practices went hand in hand with a high level of profitability. This preliminary result needs to be explored a step further, notably with the motivational dimension during knowledge creation and with the social context explaining the organizational coordination.
A promising avenue may be the combination of industrial relations arguments with the daily functioning of the firm through the firm’s “internal” labour market (Doeringer and Piore, 1971 in Nelson and Winter, 1982, p. 110). This suggests that “substantial areas of behavioural discretion” exist within organizations. For Leibenstein (1987) the hierarchical structure could not control the daily routines of its members because these latter are able to exercise their discretion ary power. The relevance of this argument to the selection of routines is clear: whatever the intention underlying an action taken in a particular circumstance, inertia may prevail because firm’s members may choose to resist the dynamic in question and decide to maintain their organizational practices and their autonomy (Stinchombe, 1965; Hannan and Freeman, 1984; Lazaric and Denis, 2001).

Leibenstein (1979) claim is to explore the “micro- micro theory of the firm” for having a better understanding of social conditions in which the individual will move its effort according to inter-organizational condition. As individuals are the core of the firm, their role for the coordination is crucial notably for cost determination. According to him, this debate is more general and goes beyond a problem of maximisation or not maximisation of profit inside the firm:

“Many organizations allow for conflict resolution through a hierarchical system so that differences among lower status individuals can be resolved by higher status individuals. But despite a hierarchical power structure, informal degrees of influence may play a significant role. Hence the multi-person situation of such created difficulties in determining how utilities are distributed and what meaning can be attached to utility maximization where actual or potential conflict exists. In other world there is no reason to assume that any system of conflict resolution necessarily results in ‘joint maximization’” Leibenstein (1979: 480).

This leads us to take into consideration the importance of organizational trust between organizational members who try to find a trade off between their own
interest and the organizational one². This compromise called the “effort convention” is a state where individuals have discretion in choosing the level of their performance in quantity and in quality. This ‘effort convention’ between organizational members is described as a “social habit” or “a routine that has an interpersonal component” (Leibenstein, 1982: 93). Trust is crucial for the coordination and performance in a context where employment contract is intrinsically incomplete. Thus in the Leibenstein’s perspective trust is a precondition of the “effort convention” (Leibenstein, 1975 1987). Trust has two components in Leibenstein terminology: vertical and horizontal ones. Without a “limited trust” a climate of suspicion between workers prevails leading them to condemn any incentives measures implemented by the management notably with the possibility of “free riding” between workers. If mistrust is generated between the management, because of ‘factionalism’, the ‘vertical trust’ is difficult to implement and incentives policy will become a problematic issue. Trust issue is the a precarious equilibrium between vertical and horizontal trust inside the firm (Leibenstein 1987, see also Guennif and Mangolte 2002)

This puzzle of maintaining a certain level of effort between groups or teams has also been explored by Akerlof (1982). In the job called ‘cash posting’, the surplus concerning the productivity’s workers (+ 15%) could be explained by a social behaviour leading employees to anthropomorphise the organization by considering this institution as a locus where gifts could be exchanged. Employees’ gift (in the context a high labour productivity) will be considered in a long term perspective and will push employers to give a certain level of “fair wage” to their employees: “the average worker works harder than necessary according to the firm’s work rules, and in return for this donation of goodwill and effort, he expects a fair wage from the firm“(Akerlof, ibid 548). This could explain why the employer may have the incentives to pay employees more then the market clearing wage. This argument however does not explain the heart of the motivation of employees. Trust dimension needs to be explored here for understanding the emergence of potential altruism inside the labour market when employees and employers face strong uncertainties³.

² In the Simonian framework, the individuals in the organization must accept the targets of the organization and must identify psychologically with these targets (Simon 1991)
³ In effect in the situation summarized by Akerlof the world is predictable by an exchange of gift. This situation has been depicted by Williamson with the notion of calculative trust where cooperation between farmers follows a predictable and regular way (Williamson 1993). Here we will take into consideration strong uncertainty
As Reynaud (1998) explains organizational trust is the backbone of the efficiency salary theories which should be more fully examined for understanding the building of long term relationships between employers and employees. Trust is not a spontaneous process and may be grounded in collective practices and leading to learn implicit commitments inside the firm. Diverse rules are feeding this process: a step by step engagement between employers and employees could create some potential positive externalities, a learning which will be useful in the presence of strong uncertainties, causal ambiguities, contract incompleteness and tacit commitments (Lazaric and Lorenz 1998).

An important distinction made in the literature is between the micro and macro foundations for trust (Nooteboom, 2002). Micro foundations include such factors as perceptions of self interest, bonds of friendship or love between the two agents. Macro sources include sanctions from some authority (the law, organisation, or patriarch) which may try to canalize conflicts inside organizations. They may also include internalised norms of proper conduct which also serve to reduce uncertainty regarding an agent’s likely behaviour (Arena, Lazaric and Lorenz, 2005). The sources of trust in an organisation may be macro in nature. For example, we may trust an organisation because of what we believe to be the case about its internal governance structure and how its incentives system sanctions employees’ behaviour and encourages them to fulfil the requirements of their various functions and roles (see Lorenz, 2002).

In the context of knowledge creation where uncertainty and causal ambiguity remains high- notably during transfer of knowledge-, the motivation of organizational members and their potential ‘absorptive capacity’ are key elements (Szulzanski et al, 2004). ‘Cognitive distance’ is far to be neutral as it could increase or decrease the level of uncertainty and the effective absorptive capacity (Nooteboom 2000). This social context maintaining a high motivation requires the building of specific rules. The description of the Japanese firm and its comparison with the American one illustrates diverse organizational rules (Aoki 1988; Coriat 1991). The evolution of

---

concerning the future notably with evolution of the environment which affects the organizational rules between employers and employees concerning the sharing of some surplus.
career opportunities for employees in the Japanese firm shows a diversity of implicit or explicit rules to cope with various shocks inside institutions or external environment.

In Toyota some implicit rules were implemented for sharing the surplus among employees and for decreasing the unitary cost of production. This archetypical rule was the following: 1) involvement of employees for constant and permanent improvement of quality and reductions of costs aim at reducing the unitary cost, 2) increasing of labour productivity, 3) increasing of global productivity and wages’ increasing for employees (Shimizu 1999). During the middle of the nineties the hiring of temporary workers for facing the lack of manpower and financial markets’ crisis lead to revise salary rules and to reconsider the so called ‘horizontal coordination’ due to an increasing complexity at intermediate levels (Shimizu, ibid). To sum up, Toyota story shows how rules are historical dependant and why new rules could emerge for sustaining new hierarchical relations inside the firm.

Organizational rules as political compromises play a crucial role for maintaining the ‘effort convention’ and for feeding its content even if rules are quite ambiguous by nature and contain many possible interpretations (March, et al 2000; Schulz 2003; Reynaud 2005). Their revision and suspension is a critical process which reinforces or reduces organizational trust and consequently the ‘effort convention’ between organizational members. The recent change of rules inside the internal labour market in France for IBM Company is very illustrative. In 2002, IBM management introduced a new rule for the teams with an increasing of wages according to fixation of prior objectives and their realization (with a notation of this performance from a ranking from 1 to 4). The implementation of such ranking has created a huge state of contestation and conflicts because the rule was judged too risky for increasing the salary and too subjective with strong inequalities in the distribution of the bonus. The state of conflict was depicted by unions as the instauration of mistrust between employees and employer and the end of the regular increasing of wages. The implementation of the new rules of the games shows the disruption of a state of truce among the firm with the emergence of permanent conflict among organizational
members impeding the coordination to run smoothly inside the firm. Let us discuss this ‘vertical trust’ in the Leibenstein terminology and the potential revision of the organizational rules between the organizational members.

II) Knowledge, bonus rule and trust dynamics: a model

Let us consider a firm organized around \( n \) interacting different groups \( i \). Define by \( x_i(t) \) the level of activation of organizational practice of group \( i \). This variable captures the intensity of commitment of the members of the group engaged in an organizational practice. We assume that the level of effort of each group, \( e_i(t) \), depends positively on \( x_i(t) \). Thus we have for \( i = 1,...n \):

\[
e_i(t) = \left[ x_i(t) \right]^{\alpha}
\]

with, \( 0 < \alpha \leq 1 \). The hierarchy tries to regulate the efforts exercised by the different groups by promoting an average effort norm \( \bar{e}(t) = \frac{1}{n} \sum_{i=1}^{n} e_i(t) \). Organizational rules concerning the bonus policy are introduced in order to encourage the energy mobilized in each group. We suppose that a bonus is given to a group when its effort is at least equal to the average norm. That is when, \( h_i(t) \geq 0 \) where \( h_i(t) = e_i(t) - \bar{e}(t) \). In that case, the group receives a bonus \( \gamma h_i(t) \), where \( \gamma \) is a random variable with strictly positive values. Indeed, uncertainty prevails in the amount of available pay supplement. In addition, as discussed above, these rules may be modified more or less frequently by the hierarchy.

We suppose that \( \gamma \) follows a Weinbull distribution \( W[a,b] \). This distribution, as is shaped below, ranges from a Gaussian distribution when \( a \) is large to an exponential law when \( a \) decreased (see Fig.1).

---

4 For a longer discussion see Arrieux (2004) Husson (2005), and Eymard Duverney 2005. According to Husson (2005) a qualitative measure of the stress has been obtained by taking into account the “disequilibrium between realized efforts and the rewards obtained by workers whatever their nature pecuniary ones (wages, bonus) or non pecuniary ones (personal evolution, reconnaissance)”. 
In this perspective, we focus on two polar types of rules, a fair quite risk-less rule and an unwarranted risk-bearing one. In the first case (GD), the distribution is Gaussian (large $a$). When they produce a sufficient level of effort, groups have the highest probabilities to receive to a certain extent an average bonus rate $\gamma$. This type of rule may favour risk adverse behaviours, but is also favourable, as shown below, to the improvement of vertical trust. Conversely, in the second case (NGD), the distribution is non Gaussian (small $a$) and is biased. Efficient groups have here the highest probabilities to receive a very small bonus rate $\gamma$, and a small probability to get a very large one. This type of rule encourages risk-oriented behaviours, but it may as well impede the development of vertical trust.

From this standpoint, let define by $\tau_i(t)$ the level of vertical trust of group $i$ at time $t$. We suppose that:

$$\tau_i(t) = \phi + \left( \mu E[\hat{h}(t)] - \nu S[\hat{h}(t)] \right) z_i(t)$$

(2)

where, $z_i(t)$ is an indicative variable such that $z_i(t) = \begin{cases} 0 & \text{if } e_i(t) < \bar{e}(t), \\ 1 & \text{if } e_i(t) \geq \bar{e}(t), \end{cases}$ $E[\hat{h}(t)]$ and $S[\hat{h}(t)]$ are the expected value and the standard deviation of the distribution $W[a,b]$ of the bonus rule, and $\mu > 0$, $\nu > 0$ are two adjustment parameters. We suppose that $\phi = \Phi(a, \sigma, n) > 0$ which captures the collective dimension of trust.

---

5 Assuming that the standard deviation of the distribution is not too large.
building among groups. Besides, the process of trust building is improved when the expected value of the bonus distribution is high, while rules with important standard deviation play a depleting role.

Finally, the process of knowledge creation is localized and modeled in each group by a Poisson process with an arrival rate $\lambda_i(t)$, where for $i = 1, \ldots, n$:

$$\lambda_i(t) = \frac{\tau_i(t)c_i(t)}{\sigma}$$

The first element $\tau_i(t)$, encapsulates the role played by trust in the process of knowledge creation. Accordingly, we suppose that a positive relation exists between trust and the propensity of group $i$ to create knowledge. High $\tau_i(t)$ favour knowledge creation, while small ones inhibit this process.

The second element, $c_i(t)$, refers to the role played by cognitive interactions between groups. The structure of interactions is determined endogenously as follows. Define for $i = 1, \ldots, n$, $X_i(t)$ by $X_i(t) = x_i(t) + x_j(t)d_{ij}$, where, $d_{ij}$ is a distance between $i$ and $j$. We suppose that the gain of $i$ produced by the interaction with $j$ is $\{X_i(t)\}^{\eta}$, with $0 < \eta \leq 1$. This captures the fact that the idiosyncratic practice of $i$ benefits from exchanges of experience with the other groups $j$ connected to $i$. We consider that $d_{ij}$ stands for some cognitive distance between the different kinds of knowledge owned by the agents. Thus, we assume that distance plays a positive role in the process of knowledge creation; but as we know this distance is also costly (see e.g. Nooteboom 2000). Assume that this cost function is given by $\{X_i(t)\}^{\theta}$, where, $\theta > 1$, then $i$ creates a link with $j$ if and only if:

$$\{X_i(t)\}^{\eta} - \{X_j(t)\}^{\theta} > 0.$$  Consequently a critical distance $d_{ij}^*(t)$ exists such that the structure of connections of $i$, $i = 1 \ldots n$ to $j = 1 \ldots n$, with $i \neq j$ satisfies:

---

---

$^6$The mean of a Weibull distribution $W[a,b]$ is equal to $b\Gamma\left[1 + \frac{1}{a}\right]$ and its standard deviation to $b\sqrt{\Gamma\left[1 + \frac{2}{a}\right] - \Gamma\left[1 + \frac{1}{a}\right]^2}$.

$^7$In the rest of the paper we simply assume that $d_{ij} = |i - j|$
where, $d_{ij}^* (t) = \frac{\left( \frac{1}{\theta} \right)^{\frac{1}{\theta - \eta}} - x_i(t)}{x_j(t)}$. Let, for $i \neq j$, $l_{ij}(t) = 1$ if $i$ is connected to $j$ and $l_{ij}(t) = 0$ otherwise. The connectivity of group $i$, $c_i(t)$, is defined as the average number of links of $i$ with $j \neq i$, $j = 1,...,n$. Thus, we have:

$$c_i(t) = \frac{\sum_{j \neq i} l_{ij}(t)}{n-1}$$

(5)

Finally, $\sigma > 0$ is a parameter which controls the range of knowledge creation. This parameter $\sigma$ is an indicator of the organizational design measuring the hierarchical pressure from classical hierarchies ($\sigma \gg 1$) to pure networking firms ($\sigma \leq 1$). Consequently, we suppose that the higher $\sigma$, the smaller the expected value of knowledge creation in group $i, \lambda_i(t)$.

Production in the firm is the outcome of the total level of effort $E(t) = \sum_{i=1}^{n} e_i(t)$ resulting from the different groups. We have:

$$Q(t) = B(t)\{E(t)\}^\beta$$

(6)

The term $B(t)$ refers to a global learning mechanism that captures the accumulation of knowledge within the firm. We have, $B(t) = 1 + \sum_{i=1}^{n} \lambda_i(t)e_i(t)$. Then, total profits are given by the profit function:

$$\Pi(t) = pB(t)\{E(t)\}^\beta - wE(t)$$

(7)

where, $0 < \beta \leq 1$, $p$ refers to the exogenous market price of the production and $w$ is the wage rate which captures the direct cost of labour$^8$.

$^8$ We thus implicitly suppose that the total productivity bonus is paid on the part of profits non distributed to the shareholders.
Finally, we suppose that the dynamics of the practices $x_i(t)$ is driven by the capacity of the group to create knowledge, $\lambda_i(t)e_i(t)$, with $i = 1,\ldots,n$. Hence, we consider the following system of $n$ coupled differential equations:

$$\frac{dx_i(t)}{dt} = x_i(t)[\lambda_i(t)e_i(t) - \delta x_i(t)]$$

where $\delta$, $0 < \delta < 1$, refers to the exogenous obsolescence rate of the practices.

In the rest of the paper we conduct numerical simulations of this system to characterize the impact of the kind of bonus rate rule on the dynamics of trust and profitability in different organizational set-ups.\(^9\)

Accordingly, as mentioned above, we consider two polar cases for the bonus rule, a Gaussian distribution, where $a = 2.5$ and a Non Gaussian one (exponential law), where $a = 0.5$ (see Fig 1 above)\(^{10}\). Then we compare in both cases, the properties of the model in terms of dynamics of trust and profitability, when the pressure of the hierarchy is neutral for knowledge creation ($\sigma = 1$), and when it is higher ($\sigma = 2$) which tends to impede knowledge creation. The rest of the model is specified as follows:

<table>
<thead>
<tr>
<th>$n$</th>
<th>$\alpha$</th>
<th>$\delta$</th>
<th>$\beta$</th>
<th>$w$</th>
<th>$p$</th>
<th>$\eta$</th>
<th>$\theta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td>0.1</td>
<td>0.75</td>
<td>1</td>
<td>10</td>
<td>0.3</td>
<td>2</td>
</tr>
</tbody>
</table>

and $\phi = \Phi(a,\sigma,n)$ ranges as follows:

\(^9\) It can be shown that the non degenerated stationary state of the system is stable provided that $\mu E[\bar{\xi}] - \nu S[\bar{\xi}] < 0$.

\(^{10}\) In the two cases $b = 2.1$.
We reproduce below two examples of the results obtained with different configurations of the interaction structure. Two organisational set up are simulated with diverse connectivity in the interactions. The results are non deterministic ones and show the difficulty of building trust inside the firm when some minima levels of profitability are required. Let us comment two examples.

**Example 1: The nature of the rule and the importance of the hierarchy**

In this example parameters are the following: incomplete graph in $t = 0$ and complete graph in $t = tMax$

Connectivity $c_i(t)$ of the $n$ groups, $t=0$ and $t=tMax$ ($1\times10^6$)
Dynamics of $x_i(t)$

Trust $r_i(t)$ in the n groups, $t=0$ and $t=t\text{Max}$ ($1\times10^6$)

Gaussian Distribution with $\sigma = 1$

Trust $r_i(t)$ in the n groups, $t=0$ and $t=t\text{Max}$ ($1\times10^6$)

Gaussian Distribution with $\sigma = 2$
Trust $\tau_i(t)$ in the $n$ groups, $t=0$ and $t=t_{\text{Max}} (1\times10^6)$

Non Gaussian Distribution with $\sigma = 1$

Trust $\tau_i(t)$ in the $n$ groups, $t=0$ and $t=t_{\text{Max}} (1\times10^6)$

Non Gaussian Distribution with $\sigma = 2$
Mauve: Gaussian Distribution with $\sigma = 1$

Green: Gaussian Distribution with $\sigma = 2$

Blue: Non Gaussian Distribution with $\sigma = 1$

Red: Non Gaussian Distribution with $\sigma = 2$

These simulations show a classical situation where relationships between employer-employees relationships are polarized. The power of the rules about the bonus distribution is crucial. In this organisational set up, groups are motivated by the incentives policy and the perception of equity towards bonus distribution. Rules are important for trust building and for the elaboration of vertical trust. In context of a greater “clarity” about the bonus policy, i.e. some perception of an “equitable rule”, trust is always positive. With the “risk adverse rule”, trust building is low and could be transformed in a kind of ‘mistrust’ inside a vertical relationship. The level of
profitability is correlated to the presence of the rule and the hierarchical weight. The more profitable organization is one with a low level of hierarchy and the “equitable rule”. The lowest level of profitability is present with the “risk adverse rule” and an important level of hierarchy. The hierarchy plays an important role here for the performance implementation which could go beyond the importance of the organisational rule concerning the profitability.

Example 2:
In this example parameters are the following: incomplete graph in \( t = 0 \) and \( t = t_{Max} \)

Connectivity \( c_i(t) \) of the \( n \) groups, \( t = 0 \) and \( t = t_{Max} \) (\( 1 \times 10^6 \))

Dynamics of \( x_i(t) \)
Trust $\tau_i(t)$ in the n groups, $t=0$ and $t=t_{\text{Max}} \ (1 \times 10^9)$

Non Gaussian Distribution $a=0.5$ with $\sigma = 1$

Trust $\tau_i(t)$ in the n groups, $t=0$ and $t=t_{\text{Max}} \ (1 \times 10^9)$

Non Gaussian Distribution $a=0.5$ with $\sigma = 2$

Trust $\tau_i(t)$ in the n groups, $t=0$ and $t=t_{\text{Max}} \ (1 \times 10^9)$

Gaussian Distribution $a=2.5$ with $\sigma = 1$
Trust $\tau_i(t)$ in the n groups, $t=0$ and $t=t_{\text{Max}} \ (1 \times 10^6)$

Gaussian Distribution $\alpha=2.5$ with $\sigma = 2$
Mauve: Gaussian Distribution with $\sigma = 1$

Green: Gaussian Distribution with $\sigma = 2$

Blue: Non Gaussian Distribution with $\sigma = 1$

Red: Non Gaussian Distribution with $\sigma = 2$

In this second configuration where interactions are more dispersed, the situation is more complicated. In particular we observe the same result concerning the power of
the rule: the more “equitable rule” sustains a process of trust building. The level of profitability is non determinist and in the presence of the “risk adverse rule” a low ‘vertical trust’ is generated with a low level of profit. This latter could increase in a long period. No trade off between trust and profit exists and the hierarchical power decreases with the level of profitability. The ‘satisfactory’ organisational set-up is created with the equitable rule and a low degree of hierarchical control with an evolution of the profit level. Indeed, in this context the “risk adverse rule” could even be more profitable compared to the “equitable rule” in some peculiar situation.

### Conclusion

In this paper we tried to integrate a co-evolution of cognitive and political mechanisms to discuss the motivational dimension of the firm. For this purpose, we introduced the “effort convention” concept which explains how groups and communities interact inside a hierarchical structure. We discussed the importance of trust issues as a precondition for a suitable activation of the ‘effort convention’. Salary rules are crucial in this process notably for implementing some perception of equity towards the bonus.

In our simulation, we introduced two types of rules: one is perceived as “equitable” comparing to its opposite which is more risky for the bonus distribution.

Our results show why the structure of interactions and the degree of connectivity between diverse groups has a significant impact on the profit level. The nature of interactions and the cognitive distance are clearly non neutral. More generally diverse organisational set-ups illustrate the power of the rules for trust building. The level of trust increases with the perception of some equity towards the distribution of the bonus. The level of equity in the distribution of the bonus is not always correlated with the level of profit and, in some peculiar cases, the “risk adverse rule” could even be more profitable comparing to the organisational set up with the “equitable rule”.

In the first example, the weight of the rule is dominant for the process of trust and is more considerable than the hierarchical control. Nevertheless concerning the level of profitability, the low level of the hierarchy control appears more significant than the solely power of the rules. In the second example, rules play always a considerable
part for trust building but the high level of trust could be associated with a high level of hierarchy. The level of profitability is correlated with a low level of hierarchy control.

References


Eymard-Duvernay F. (2005), Défauts de coopération et chômage: une théorie institutionnaliste, CEE n° 46 septembre.


Hodgson G. M. (2004), Opportunism is not the only reason why firms exist: why an explanatory emphasis on opportunism may mislead management strategy, *Industrial and Corporate Change*, 13, 401-418


