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Leadership Styles and Organization: a Formal Analysis

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In the management literature three types of leadership styles are commonly considered: directive, transactional and transformational leadership. This paper is aimed at exploring the analytical content of this typology and then bridging the gap between management and industrial organization on a crucial issue for the collective action.

Keywords: *Leadership, organization, vertical relations.*

Dans la littérature en management, trois types de styles de leadership sont habituellement considérés : le leadership direct, transactionnel et transformationnel. Cet article vise à explorer le contenu analytique de cette typologie afin d'établir un lien entre le management et l'organisation industrielle, sur un sujet important pour l'action collective dans les organisations.

Mots-clés : *Leadership, organisation, relations verticales.*

En la literatura de management, habitualmente se consideran tres tipos de estilos de liderazgo: le liderazgo directo, el transaccional y el transformativo. Este artículo intenta explorar la organización industrial sobre un tema importante para la acción colectiva en las organizaciones.

Palabras claves: *Liderazgo, organización, relaciones verticales.*

1. – Introduction

The leadership literature is overwhelming: the role of leaders within the organization has been extensively analyzed by social scientists of any field. Management scholars recognize that the successful firms are those which can identify individuals with the capabilities, the personal skills and the overall vision which make the collective action effective. However, some mismatching of leaders is often observed. There are many examples of organizations which are provided with so called leaders who are not in tune with their rules and objectives and are therefore a cause of mismanagement and poor performances. There is not just one way to being the leader of an organization. It is the leadership style which matters and can contribute to the success of the organization in specific conditions of environment and regulatory rules.

In the management literature three types of leadership styles are commonly considered:

- The directive leadership
- The transactional leadership
- The transformational leadership.

This typology is commonly based on personality traits arguments. This paper is aimed at showing that this typology can be justified even in the pure rational decision making framework. It is postulated that the organizational leader is a rational decision maker operating on two different sides: on the behavioral side through actions of animation, motivation, communication towards the members of the organization, on the economic side through decisions on rewards, contracts and punishments. According to the organizational context and the trade-off made by the leader between both types of actions, the leadership will be of directive, transactional or transformational type.

The article is organized as follows: In section (2), the standard leadership styles are presented. Modeling the behavioral and economic side actions is made in section (3). In section (4), the resale price maintenance problem is revisited: it is proved that it can be seen as resulting either from a directive or a transactional manufacturer leadership on the distribution channel. Avenues for further researches are indicated in section (5).

2. – Leadership styles: from psychology to management

Leadership results evidently from personality factors, intelligence and communications skills. Besides this trait approach, leadership research has shifted from leadership behavior to leadership style (Yulk, 2006). It is what the leaders do which matters and not only their personal characteristics.

A general leadership is a behavior that gives purpose, meaning and guidance to collectivities by articulating a collective vision that appeals to ideological values, motives and self-perceptions of followers" (House, 1995, p.413)

In other words a leader of group is a person
1. whose behavior can influence the behaviors of other members of the group,
2. who is aware of it,
3. use this influence to achieve collective goals.

Let us present briefly the main features of the directive, transactional and transformational leadership. Quotations are drawn from Aronson (2001).

2.1. Directive leadership

Directive leadership is a mode of influence which is based upon coercion and commandment. The leader knows what the follower has to do and why. He does not take care of the preferences of the followers. In practice, the job of the leader is to impose his view and/or to convince the subordinates to act according to his decision. There is no great feedback between the parties. Of course directive leadership covers a broad range of attitudes, from autocratic... :

> *I'll tell you what we are going to do because I'm the boss.*

...to consensus seeking:

> *We'll all meet and discuss it until everyone agrees on a decision but the result is the same.*

2.2. Transactional leadership

Transactional leadership is based upon participation and bargaining.

> *It involves an exchange between leader and subordinate such that each receives something from the other in return for something else.*

This mode of leadership does not intend to control the behavior of the subordinates but to build contracts with them so as to align their interests with those of the collectivity. Two manifestations of transactional leadership can be identified in the literature (Bass, 1978):

- *Contingent reward*: the leader is able to establish agreements with their followers on the tasks to be done and the rewards attributed in case of successful completion.
- *Management by exception* when the control of the leader is exerted only in case of significant divergence from planned results.

In the same vein, Waldman et al. (2001) defines the transactional leadership as follows:

> *A transactional leader is one who operates within an existing system or culture (as opposed to trying to change them) : (1) attempting to satisfy the current needs of followers by focusing on exchanges and contingent reward behavior and (2) paying attention to deviations, mistakes or irregularities and taking action to maker corrections.*

2.3. Transformational leadership

Transformational leadership gives emphasis on the charismatic behavior of the leader who acts to stimulate changes in the subordinates attitudes and values. The leader does not try to command followers' actions but he seeks to influence some of their determinants. According to Conger (1999), the transformational leader role encompasses the following elements:

> *(a) influencing followers by establishing a vision for a better future, (b) inspiring followers as opposed to controlling them (c) leading by example (d) contributing to subordinates' intellectual simulation, (e) enhancing meaningfulness of goals end behaviors (f) fulfilling followers' self actualization needs, (g) empowering followers through intrinsic motivation, (h) exhibiting confidence in subordinates' ability to attain higher levels of achievement and (i) enhancing collective identity,*

3. – Modelling leadership styles

These three leadership styles can be represented in a dyadic structure in which a leader faces an unique follower (cf. Farmer and Aguinis, 2005). The previous analysis of leadership styles suggests that a leader within an organization is a person who is able to intervene on two different and in practice rather disconnected worlds- of the collective action, as represented on figure (1):

- On the behavioral side by appropriate actions designed to enhance the motivation of the follower (meetings, seminars, communication, etc…). These actions are encapsulated in a behavioral action variable $\alpha \in A$
- On the economic side, the leader takes standard decisions of management in terms of allocation of resources, monetary transfers, contracts. These decisions are described by an economic decision variable $x \in X$.

The pair $[x, \alpha]$ stands for the action set of the leader. On the other hand the behavior of the follower is represented by a variable $b \in B$, which is, among other factors, determined by the behavioral action of the leader, i.e.

$$b = b(\alpha) \qquad (1)$$

I

In this context, the follower is a pure economic decision maker, with a decision variable $y \in Y$ (quantity, effort, acceptance of contracts, etc..) and an utility function of the form $v(x, y, b)$. The utility function of the leader is $u(x, y, \alpha) = w(x, y) - c(\alpha)$,where $c(.)$ stands for the cost incurred by the behavioral action.

This general framework includes situations of constraining leadership where the behavior b of the follower does not influence his utility function, i.e. $v = v(x, y)$ but determines the set of decisions he is able to consider, i.e. $Y = Y(b)$.

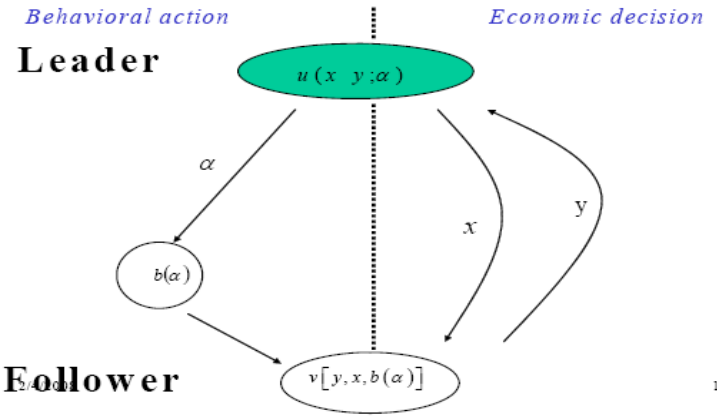

Figure 1: Behavior and decision

This particular case resorts to our general formalism by defining a new utility function v(x, y, b) = v(x, y)χ(y, b) with :

$$\chi(y,b) = \begin{cases} 1 \text{ if } y \in Y(b) \\ -\infty \text{ if not.} \end{cases} \qquad (2)$$

At this stage of generality, nothing is said neither about the information structure - who knows what in the organization? How uncertain is the environment? -nor about the timing of decisions - who plays the first ? -. These elements have to be specified in particular situations. Le us examine now how the leadership styles can be reshaped within this framework.

3.1. The directive leadership

For simplicity of exposure, we assume that all the variables take value in <+, and that all the functions satisfy all the requested properties of regularity and concavity. In this context, the directive leadership is characterized by 4 elements:

- The leader is a pure behavioral actor; his action set is reduced to [α]. He has a costless and effective control of the follower's behavior b, i.e. c = 0 and $\partial v/\partial b \neq 0$
- The leader utility coincides with the collective utility and depends only on the follower decision ; namely

$$u = w(y) \tag{3}$$

- The information is perfect.
- The leader is the first-mover decision-maker.

Let $y^* = \arg\max_y w(y)$, the socially optimal value of the follower decision. and $y(\alpha) = \arg\max_y v(y, b(\alpha))$, the best decision of the follower according to the behavioral action α. For the leader, the optimal behavioral action is $\alpha^* = \arg\max_\alpha w(y(\alpha))$, solution of

$$w'(y(\alpha))y'(\alpha) = 0. \tag{4}$$

When $y'(\alpha) \neq 0$,i.e. $\partial u_2/\partial b \neq 0$,relation (4) yields : (5)

$$y(\alpha^*) = y^*.$$

In words, thanks to a perfect and costless control on the behavior of the follower, the leader pushes the follower to choose the right decision. *The decision of the follower is independent on his utility function v*.

3.1.1. Costly control

When the cost c(α) is taken into consideration since, equation (4) becomes :

$$w'(y(\alpha))y'(\alpha) + c'(\alpha) = 0, \tag{6}$$

and the decision of the follower depends on his own utility function.

3.1.2 Uncertainty on behaviour

Let us assume that there is a noise affecting the relation between the behavioral action i.e.

$$b = b(\alpha, \varepsilon), \tag{7}$$

where ε is a random variable. The leader has an imperfect knowledge on the impact of the behavioral action on the follower's behavior. Two cases may be distinguished

1. *The follower does not observe the noise on his behavior*
The sequence of decisions is $\alpha \rightarrow y \rightarrow \varepsilon$. The uncertainty is revealed a posteriori. The risk-neutral follower best response is namely $\hat{y}(\alpha) = \text{argmax}_y\ E\ [v(y, b(\alpha, \varepsilon))]$ and the optimal α is solution of

$$w'(\hat{y}(\alpha))\ \hat{y}'(\alpha) = 0. \qquad (8)$$

equivalent to relation (4). Hence $\hat{y}(\alpha) = y^*$ and the follower's decision is still independent on his utility.

2. *The follower observes the noise*
The sequence of decisions is $\alpha \rightarrow \varepsilon \rightarrow y$. In this context, the best response of the follower is the random variable $y(\alpha, \varepsilon) = \text{argmax}_y\ v(y, b(\alpha, \varepsilon))$. Then the optimal behavioral action $\overline{\alpha}$ of the (risk neutral) leader is solution of the equation:

$$E\left[w'(y(\alpha,\varepsilon))\frac{\partial y(\alpha,\varepsilon)}{\partial \alpha}\right] = 0 \qquad (9)$$

In this case, the

follower's strategy is the random variable $y(\alpha, \varepsilon) \neq y^*$, which generally depends on utility v.

3.1.3. Constraining leadership

Let us consider the particular situation where the functions $v = v(y)$, $u = w(y) - c(\alpha)$ are concave functions of their arguments. In addition we assume that $c' > 0$. The behavior of the follower is measured by the range of values in which he takes a decision, i.e. $Y(b) = [0, b]$. For the sake of simplicity we assume that $b = \alpha$, so that the leader has a direct control on the upper bound of the follower' decision.

Proposition 1 *Let* $y^* = \arg\max_{y \in \Re^+} [w(y) - c(y)]$ *and* $y_0 = \arg\max_{y \in \Re^+} v(y)$. *1*

1. *if* $y^* < y_0$, *the follower decides* y^* *and the leader* $b = y^*$;
2. *if* $y^* \geq y_0$, *the follower decides* y_0 *and the leader* $b = y_0$;

Proof. see Appendix 1. ■

y^* represents the first-best solution, since the leader seeks here to maximize the collective utility less the cost of control. y0 is the best solution for the follower. Then the proposition states that the leader's power of restricting the feasible set of the follower can be used to achieve the best choice for the leader; but this is not always the case. It may occurs that the leader can only sustain the follower's best decision[1].

3.2. The transactional leadership

The transactional leadership role is based on the following points

- The leader is a pure economic actor; his action set is reduced to [x] .
- The leader's utility may partly incorporate the collective utility. There are mutual interdependencies between the follower and the leader, so that both utility functions depend on x and y :

$$v = v(y, x) \tag{10}$$

$$u = w(x, y). \tag{11}$$

- The information is imperfect or incomplete.
- The leader has a first mover advantage

Formally, a transactional leader is involved in a standard Stackelberg leadership or in a principal-agent relationship when his action takes the particular form of a contract. His action deals with designing contracts in order to align the follower's action to his own objectives. In this category, all the literature on incentive and contracting in Industrial Organization can be put. Let examine two specific contributions coping explicitly with the leadership problem.

1. This contrats with the directive case as the modified utility ˜v which endogenizes the constraint has no derivative $\partial v/\partial b$ defined everywhere.

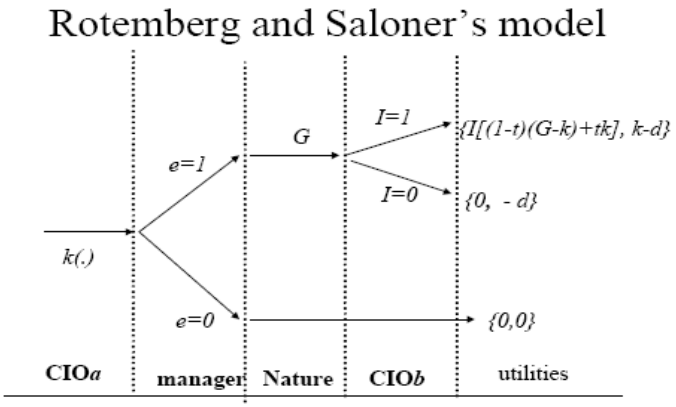

Figure 2: Extensive form of the game

3.2.1 The model of Rotemberg & Saloner

Rotemberg & Saloner (1993) consider a relationship between a manager who proposes projects and a CEO in charge of implementing them. The profit of an implemented project is a random variable G. Let us reformulate the model by exhibiting the underlying extensive form game, as represented on figure (2):

- At stage 1, the CEO chooses a remuneration level k on the basis of effort or profit
- At stage 2, the manager exerts a non observable effort e ϵ {0, 1}
- • At stage 3 :
  - if e = 0, no project is proposed by the manager and both the manager and the CEO get 0,

  - if e = 1,the value of G is realized.

- At stage 4, the CEO decides to implement the project (I = 1) or not (I = 0).

The utility of the manager is E(k) − de, where d stands for the disutility and E(k) for the expected remuneration. The payoff of the CEO is differently evaluated at stage 1 and 3; Hence for the sake of exposure, it is convenient to split up the CEO into two different players of the game, CEOa and CEOb:

- At stage 1, the CEOa utility coincides with the shareholder expected profit E(G) − k.
- At stage 3, the CEOb utility is a weighted sum of the profit and the utilities of the managers I $[(1 - t)(G - k) + tk]$, with a parameter[2] $t \in [0, 1]$ measuring the degree of empathy of the CEOb with the manager.

The manager is effectively paid only when the project is implemented. These authors show that, in highly stochastic environments, the firm is better off when the CEO adopts an empathic style, as it is a proper way to reduce the moral hazard effects which makes the manager less reluctant to exert effort as he knows that an unprofitable project would be rejected. In this context who is the leader?

1. The distinction between CEOa and CEOb is implicit in the model. The argument given to justify that the CEO maximizes the profit at stage1 and something else at stage 3 (except when t = 0) is not quite convincing[3] .

2. The interpretation of parameter t is somewhat misleading. It measures a behavioral characteristic rather than a leadership style in the sense used in the literature as presented above.

3. The actual leader of the organization is not CEOb but CEOa who proposes a remuneration contract and has a first-mover advantage; he is a typical transactional leader who maximizes the profit of the whole organization. Formally CEOb is the follower of (i) the manager and, (ii) indirectly of CEOa, although he is a key actor within the organization.

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2. Parameter t is denoted θ in Rotemberg and Saloner's paper. This change is made to avoid confusion with the notations used in Hermalin's paper considered below

3. "The shareholders would choose a compensation level for the manager that is just sufficient to elicit effort. Thus they would insist that the CEO set k = d, even though the CEO would like to pay the manager more", p. 1308. Why the manager will not continue to maximize the profit in the same way at stage 3 ?

3.2.2. The model of Hermalin

The contribution of Hermalin (1998) exemplifies the role of private informa
: This author considers a team model with N workers. Worker n exerts an e
e_n ; His utility is $w_n - d(e_n)$,where w_n is his wage and $d(e_n)$ the disutilit
effort. The total value of the team is affected by a stochastic productivity fa
θ realized after efforts have been exerted, i.e. $V = \theta \sum_{n=1}^{N} e_n$. One of the wo
is the leader in the sense that he has a perfect knowledge of θ.The prob
is stated as a signalling game. Two versions are considered. Let us introc
explicitly the regulator of the team, in charge of maximizing the aggre
welfare $V - \sum_{n=1}^{N} d(e_n)$

Version 1 (mechanism-design solution)

- At stage 1, the regulator proposes a contract {wn(., .)} ,where wn(V, θ) is the wage paid to worker n when total value is V and the announced value of θ is ˆθ,
- At stage 2, the leader announces the value θ,
- At stage 3, the workers exert efforts,
- At stage 4, the random variable θ is realized.

Hermalin proves that a linear optimal contract with equal share of V can be found that induces truth-telling: the leader is better off when revealing the true value of θ, at stage 2. The optimal contract includes a sort of side-payment from the leader to the other workers that can interpreted as the sacrifice paid by the leader to make his announcement of θ credible.

Version 2 (leading by example)

- At stage 1, the regulator proposes a contract {wn(.)} ,where wn(V) is the wage paid to worker n when total value is V.
- At stage 2, the leader exerts effort, taking into account his private information on θ.
- At stage 3, the other workers exert efforts.
- At stage 4, the random variable θ is realized.

Here, the leader does not announce θ; he expands effort before the other workers who can observe this.

Hermalin exhibits a contract and a separating perfect Bayesian equilibrium in which the workers mimic the leader's effort, yielding a

better aggregate welfare than in the mechanism-design game. For d(e) = $e^2/2$, the equilibrium strategy of the leader $\check{e}(\theta)$ providing the optimal contract is found.

Clearly, the regulator who is able to write a second-best efficient contract (in version 1) or more (in version 2) is the transactional leader of the organization. *Un leader peut en cacher un autre...*

3.3. The transformational leadership

The transformational leader acts upon the behaviors of other agents in the organization. This is the more general framework which can be considered. As we have seen, the directive leadership is a polar case of transformational leadership based on coercion and allegiance. Besides this, is not easy to elaborate an economic content to the notion of behavior. Formalizing how the behaviors are affected by stimuli triggered by others is a tricky task. However, the two above presented models provide some fruitful examples of transformational leaders in Organizations

1. *The transformational leader acts upon behavior through appropriate hiring decisions*. Rotemberg and Saloner consider (p. 1310) that the shareholders can previously hire the right CEO : at stage 0, they choose the best value of parameter t which maximizes the profit of the firm, taking into account a hiring and training cost C(t). In this context, the shareholders act as a transformational leader.

2. *The transformational leader benefit from private information*. The leader considered in Hermalin's model can influence the behaviors of the organization members through signaling. He is in a transformational leader position with respect to the other workers since he benefits from an informational advantage. He has a "better vision of the future" (cf. above the quotation of Conger).

Regardless these specific situations, to what extent behavioral actions differ from economic decisions (cf. figure 1) ? Let us elaborate on this issue using the popularized concept of marketing mix. Clearly, in the relationship between the marketer and the customer, the marketer plays the role of the leader and the customer the role of follower.

The marketing mix is made of 4 elements (the four Ps !) : product, price, place and promotion. As it is well known in the marketing literature:

- Product stands for all decisions on product quality, design, packaging, branding.
- Price stands for all decisions on discounts, allowances, credit terms.
- Place stands for the various activities concerning channel distribution, assortments, location, etc.
- Promotion stands for the various activities undertaken to communicate and promote the product; this concerns advertising, public relations, direct marketing.

Clearly, product, price and place activities resort to economic decisions while promotion activities that aim at persuading the customer to buy the product are behavioral actions. Hence, the marketer is by essence a transformational leader on his targeted market. He has no authority on the consumer since buying is a voluntary activity. Advertising is a signaling activity where the marketer wants to provide information on the product and to build brand preferences. But the marketing mix strategy is the art of combining and funding all theses 4 components in order to gain a competitive advantage.

More generally, the marketing mix example suggests that the behavioural actions, more than economic decisions:

- are long run actions whose effects are displayed over time. A brand image cannot be created ex nihilo,
- are strongly affected by uncertainties ; the effectiveness of an advertising program is not a deterministic function of the advertising expenditures.

These elements are probably the key characteristics of the behavioral actions in any transformational leadership organization. This is an open issue for further investigations.

4. – Directive vs transactional leadership: an illustrative example

Resale price maintenance (RPM) is a type of vertical restraints involved in relationships between manufacturers and retailers.

It typically resorts to the directive leadership of the manufacturer, in which the leader imposes some constraint on the decision of the follower (cf. subsection 3.1.3); In the RPM case, the manufacturer prevents the retailer to charge a price lower than some value.

A great deal of literature has been devoted to discussing the implications in terms of efficiency of various vertical restraints (e.g. Mathewson and Winter, 1983, Rey and Tirole, 1986). One of the arguments in favor of RPM is that it avoids the double marginalization externality which makes vertical integration socially more desirable (Spengler, 1950). This result is somewhat puzzling as it tends to justify a directive leadership that evidently hurts the free economy principles !

We are going to prove that we could get the same Pareto improving property in a transactional leadership framework: it turns out that in a vertical relationship, maximum RPM can rationally be accepted by the retailer and the manufacturer, if both parties are able to design the ”good” contracts. Analytically, this amounts to say that maximum RPM can be defined as the Nash condition of a contracting game. In this case *the leadership of the manufacturer becomes an transactional leadership*.

Let us consider a monopolistic manufacturer selling a product through an unique retailer. The information is assumed to be perfect so that no moral hazard problems are involved. The unit costs are assumed to be constant (c for the manufacturer, γ, for the retailer). The manufacturer sells at wholesale price s and the retailer resells at price p to the consumers. The global demand function is given by $q = D(p)$,with $D' < 0$ and $D'' \leq 0$. The manufacturer and retailer profits are respectively $P(s, p) = (s-c)D(p)$, $R(s, p) = (p-s-\gamma)D(p)$.

The consumer surplus is $S(p) = \int_p^{+\infty} D(u)du$.

4.1. Doublemarginalization andmaximumresale-pricemaintenance

The double marginalization price-fixing arises from the Nash conditions of the two-stage game where the manufacturer and the retailer successively decide prices s and p. It then results in prices p*, s* solutions of the following program:

$$\begin{cases} \max\limits_{s,p} (s-c)\, D(p) \\ (p-s-\gamma)D'(p) + D(p) = 0, \end{cases} \qquad (12)$$

Let P^* and R^* be the profits of the manufacturer and the retailer .The joint profit maximization (vertical integration) situation does not depend on wholesale price s ; it deals with a retail price p^m = argmax $(p - c - \gamma)D(p)$ and a quantity sold, $q^m = D(p^m)$. Under the standard assumptions made on the demand function, price p^m is determined by

$$(p^m - c - \gamma)D'(p^m) + D(p^m) = 0. \qquad (13)$$

As it is well known, $p^m \leq p^*$, $(p^m - c - \gamma)q^m \geq P^* + R^*$ and $S(p^m) \geq S(p^*)$. Consequently the double marginalization is associated with a loss of efficiency for the firms and the consumer; *it can be implemented through a vertical restraint imposing to the retailer a maximum retail price* equal to p^m and a wholesale price s^m taking any value of interval $[c, p^m - \gamma]$, so that the sum of the profits of the firms is $(p^m - c - \gamma)\ q^m$. The question is to know how this resale-price maintenance constraint can be written in a contract.

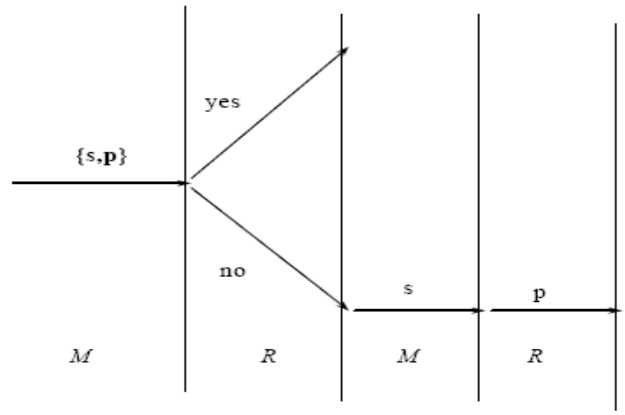

Figure 3: Game tree

4.2. A contract to sustain maximum resale-price maintenance

We will prove that the maximum resale-price maintenance can be derived as a Nash equilibrium condition of two types of games between the manufacturer and the retailer where both parties are

ensured to get higher profits than those given in the double marginalization. Let us define the two following multi stage game as follows (cf. 3):

- Stage 1: The manufacturer proposes a contract (s, p) .
- Stage 2: The retailer accepts or refuses.
- Stage 3: (i) In case of acceptance, contract (s, p) is enforced. (ii) in case of refusal, the firms are involved in the double marginalization two-stage game, resulting in prices (s*, p*) and profits P* and R*, as computed above.

The (subgame perfect) Nash contract (s^M, p^M) is solution of program P^M

$$\begin{array}{l}\text{Program } \mathbf{P}^M \\ \max\limits_{s,p} (s-c)\,D(p), \\ (p-s-\gamma)\,D(p) \geq R^*;\end{array}$$

where $(p - s - \gamma)D(p) \geq R^*$ stands for the participation constraint.

Proposition 2 The solutions of program P^M is given by the following conditions
:

1. $p^P = p^m$,

2. $(p^m - s^P - \gamma)D(p^m) = R*$ with $(s^P - c)D(p^m) \geq P^*$,

Proof. The Lagrangian of problem P^M is

$L = (s - c)D(p)+ \alpha [(p - s - \gamma)D(p) - R*]$. First order conditions (which are also sufficient because of the concavity of the profit functions) are :

$$\begin{aligned}(s - c)D'(p) + \alpha [(p - s - \gamma)D'(p) + D(p)] = 0 \qquad (14)\\ D(p) (1 - \alpha) = 0\\ \alpha [(p - s - \gamma)D(p) - R*] = 0.\end{aligned}$$

It follows $\alpha = 1$, $(p - c - \gamma)D'(p)+D(p) = 0$, $(p - s - \gamma)D(p) = R*$. Hence the result; note that $(s*, p*)$ belongs to the feasible sets of P^M. ■ .

Then condition 1 of proposition (4.2) means that the RPM constraint can be written in a contract acceptable by both parties as it expresses a Nash equilibrium condition. It yields the second-best solution of the distribution channel, i.e. the solution given by the vertical integration of the manufacturer and the retailer. To summarize, better contracting than constraining. The manufacturer may act as a contractual leader for the sake of the distribution channel welfare.

5. – Concluding remarks

This paper was aimed at discussing the analytical content of the leadership notion and its relation to the organization type. Of course this formal approach does not exhaust the subject and two general questions would deserve attention (i) What is the right leader of the right organization ? i.e. is there a one-to-one relationship between the leadership style and the network of contracts defining the organization? (ii) Why various leadeship syles may coincide in the same organization, perhaps at different levels and how do they articulate together? these questions are crucial for driving the organizations and a formal approach may explain some stylized facts on leadership leading to more accurate recommendations in human resource management.

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Appendix 1: The constraining leadership: proof of proposition (1)
Then the optimization program of the follower is

$$\begin{cases} \max_y v(y) \\ y \leq b \end{cases} \qquad (15)$$

First-order conditions are:

$$v'(y) = \lambda,\ \lambda \geq 0,\ (b - y) \geq 0,\ \lambda\,(b - y)) = 0 \qquad (16)$$

Relations (16) can be considered as the constraints of the program of the leader[4] , which can be written as:

$$\begin{cases} \max_{y,\lambda,b} [w(y) - c(b)] \\ v'(y) = \lambda, \\ \lambda \geq 0, \\ \lambda\,(b - y)) = 0, \\ y \leq b. \end{cases} \qquad (17)$$

The Lagrangia

4. This technique is used in Thépot (1995).

n of program (17) is L = w − c+μ(v′ − λ)+θλ+βλ(b − y)+ γ(b − y). Thefirst order conditions are:

$$\begin{cases} w' + \mu v'' - (\beta\lambda + \gamma) = 0, \\ -\mu + \theta + \beta(b - y) = 0, \\ (\beta\lambda + \gamma) - c' = 0, \\ \theta\lambda = 0, \theta \geq 0, \\ \gamma(b - y), \gamma \geq 0. \end{cases} \tag{18}$$

Two cases have to be considered (i) $\lambda > 0$, then b = y and $\theta = 0$. Hence $\mu = 0$, and (18i) yields $w'(y) - c'(y) = 0$, namely, $y = y^*$. This is the optimum if $\lambda = u'(y^*) > 0$. Because of the concavity of u, this is true if $y^* < y'$.(ii).$\lambda = 0$,then $v'(y) = 0$ and $y = y_0$. It results from (18iii) that $\gamma = c' > 0$, then $b = y_0$, $\mu = \theta \geq 0$. This is the optimum when $w'(y_0) - c'(y_0) = -\mu v''(y_0) \geq 0$,i.e. when $y^* \geq y_0$. This completes the proof.