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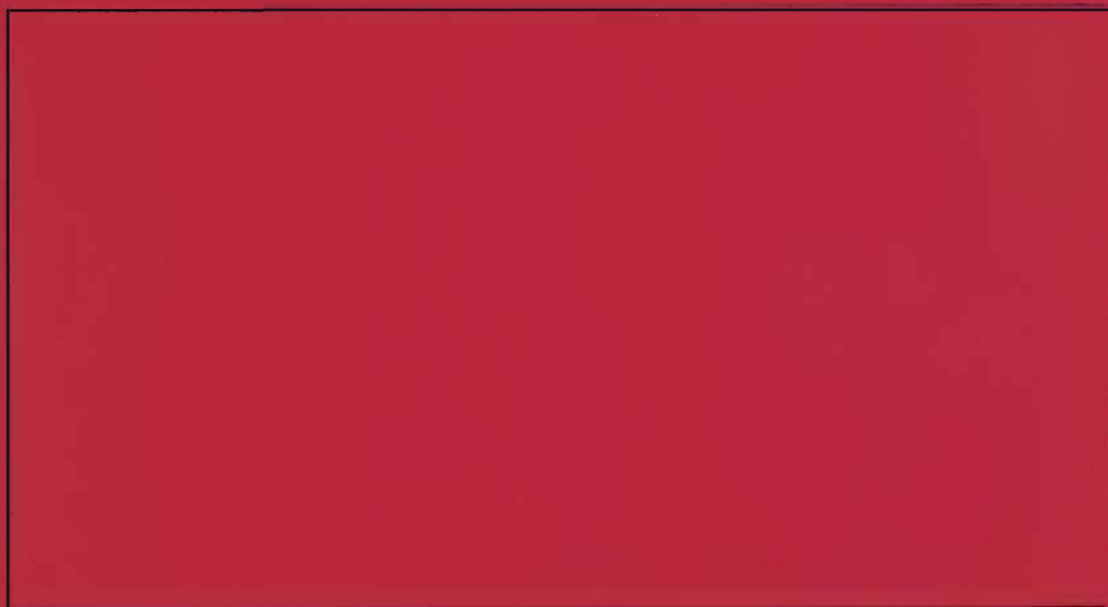
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THE THEORY OF INFORMAL TRANSACTIONS IN  
BUREAUCRACIES : SOME QUALIFICATIONS

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## I. Introduction

Our understanding of organizations has greatly progressed with the realization that one of their essential internal mechanisms is constituted by voluntary informal transactions between members. This important truth would not, perhaps, be considered as completely new in other disciplines (see Padioleau [1986]), but, in economics, it does strike by its novelty and, in fact, it is far from being fully assimilated by the profession. In my case at least, it was the book of Breton and Wintrobe [1982] that proved illuminating. Voluntary exchanges of informal services constitute precisely the central part of their analysis.

From the centre, we can move upwards or downwards. Moving upwards, we encounter the problem of explaining on what basis the development of exchanges of informal services can be founded when third-party enforcing agencies, and markets, do not exist. Going downwards, we find the predictions that can be derived from analysing the bureaucracy as a locus of exchanges between individuals. We cannot expect the whole argumentation, from the foundations part down to the predictions, to be completely binding since auxiliary assumptions have to be injected at various stages. But we can require the story to be consistent. The story proposed by Breton and Wintrobe is very consistent. On the upper level, the strong assumption is made that informal transactions rely exclusively on trust -viewed as an endogeneous variable- and take place within trust-based networks that are substitutes for markets. On the bottom level, the strong prediction is derived that vertical trust (trust between a superior and his subordinates) is efficiency-enhancing from the point of view of the superior, while horizontal trust (trust between subordinates) is inefficient<sup>1</sup>.

In this paper, both contentions are qualified. But the ambition of the paper is certainly not to change substantially Breton and Wintrobe's story. We can be sure that many of the different pieces that they have forged and assembled in their book will be replaced or modified in the course of time. This is the fate of all interesting theories. But only time-consuming and collective efforts can achieve this. The only ambition of this paper is a small beginning in that direction.

Section II of the paper compares some of the mechanisms, others than trust, which have

been proposed to explain self-enforcing exchanges. Then, Breton and Wintrobe's modelling of trust and trust accumulation is looked at critically in Section III. Section IV presents an alternative mechanism, inspired by the Popperian philosophy of the growth of knowledge. Up to that point, we are concerned only with the foundations part of the story. However, in Section V, partly as an application of ideas presented in the previous sections and partly on the basis of some other ideas introduced at that stage, I analyze a particular kind of network, the "transbureau" network, based on horizontal trust. Since transbureau networks are compatible with vertical trust, and moreover are efficient whenever there is enough of this vertical trust, an important prediction derived by Breton and Wintrobe is qualified.

## II. Alternatives to trust as substitutes for third-party enforcement.

Explanations of the observation that individuals do enter into agreements that are not enforced by a third-party agency can be divided into five categories. The explanations can be founded on the expectation of repeat business, on strategic equilibrium, on reputation, on trust, and on enlarged rationality. I shall not discuss the somewhat too numerous possibilities opened by the enlargement of rationality (see for instance Akerlof [1984]), and shall turn to trust only in the next section. None of the three remaining types of explanations is completely satisfactory in itself.

### A. The perspective of repeat business.

Expectations of benefits from repeat business are an important element in most, if not all, attempts to account for self-enforcing agreements but they cannot constitute the sole basis of a consistent story. This point is particularly clear if we look at an attempt such as Telser [1980]'s to rely exclusively on repeat business. Telser's analysis focusses on a two-persons relationship and we shall interpret his world as the one of Robinson Crusoe and Friday, and the future benefits he refers to as the traditional gains from trade. In a nutshell, his argument is the following: "A party to a self-enforcing agreement calculates whether his gain from violating the agreement is

greater or less than the loss from future net benefits that he would incur as a result of the detection of his violation and the consequent termination of the agreement by the other party" (p. 28). Clearly, a crucial assumption here is that it will be in the other party's interest to terminate the agreement if it has been violated by the first party. This assumption is contradictory with the other assumptions made in Telser's paper. In the world of this author, bygones are bygones, goodwill is irrelevant, "rational behavior by the parties to an agreement requires that the probability of continuing their relation does not depend on their past experience with each other" (p. 36). But if this is the situation, a violation cannot affect the calculations that are made one second after it has occurred. At this point of time, it is in the other party's interest to accept any new promise made by the violator that he will respect his obligations in the future (that is, to accept it exactly to the same degree as he accepted the same promise made before the violation). Thus, under Telser's assumptions, what is compared to the short-run gains of violation is definitely not the consequence of the termination of the agreement. Alternatively, if, for semantic reasons, one wishes to define a self-enforcing agreement as one that is terminated as the consequence of a violation (as done, for instance, by Yarbrough and Yarbrough [1986]), what is not compared with the benefit of the violation is the total interruption of an interaction with the other party. What it is exactly that is compared cannot be said within Telser's framework. Introducing the new considerations that are needed leads us to the theories of optimal strategies, to the theory of reputation or to the theory of trust.

### B. Strategic interaction.

The foregoing objection to Telser's reasoning is clearly related to the problem of non-credible threats, which is well known from the literature on strategic interaction<sup>2</sup>. There, the basic assumption is that the real objects of choice are strategies, i.e. rules or plans that indicate what are the policies to be followed at any time in function of what the others are expected to do or have done. Within a strategy, and contrarily to Telser's main assumption, past experience does have an influence on actions at any point of time. The history of the interaction

counts. Whether a strategy produces self-enforcing cooperation (if that is the objective), depends very much on the strategies with which it interacts. When these are not known, the simple strategy of reciprocity, or "tit for tat" (start by cooperating and then do whatever the other did on the previous move), does very well on average for that purpose (see Axelrod [1984]).

Reciprocity, or other strategies, can certainly elicit self-enforcing cooperation in some circumstances. But, in the context of interpersonal interaction which is the one we are concerned with in the case of bureaucratic networks, information plays a more subtle role than the one it is given by most if not all models of strategic interaction. Many models are concerned with firms, whose objectives can be assumed to be something like long-term profits or the value of their equity<sup>3</sup>, or, more generally, with situations in which pay-offs can be specified. When we interact with a person (even for given, limited, purposes), to know the pay-offs he draws from this relationship, or how he values them, we would have to know his utility function, or some aspects of it. At the same time, we are willing to learn in the course of our relationship about that person. In particular, we are ready to take notice (immediately) of all sorts of new information (not only the one provided by the history of the strategic interaction) and of new circumstances. Thus, our strategy, inasmuch as it can be said that we have one, should be tentative and change in the course of time<sup>3</sup>. The same applies to the person with whom we interact. Strategic interaction models, by segmenting the relationship (see below), can deal only with one aspect of this complexity. Strategic interaction is hardly avoidable in contexts in which relatively isolated two-persons relationships are implied but, like repeat business, can only be an element in the story that we seek.

### C. Reputation.

There are several ways to introduce reputation. One can speak of reputation even in a two persons framework by segmenting the relationship: the reputation established in early periods influences the strategy adopted by the other party in later periods. For instance, concern of one actor with his or her reputation can play a role in such long-term relationships (considered in

isolation) as the one between a wife and her husband, the one between The United States and the Soviet Union or the one between a bureaucrat and his or her secretary. Treated in this way, reputation is only a particular aspect (when we allow strategies to change in the course of time as a result of the history of the interaction) of the strategic interaction already considered.

More frequently, reputation is introduced in models in which more than two decision-makers is assumed. Among these models, however, a distinction must be made between those that invoke reputation (or "brand name") but do not give it a really decisive role and those that do. Perhaps surprisingly, the models of Shapiro [1983] and, less clearly, of Klein and Leffler [1981] (see also Klein [1984]) belong to the first group. Let us, for example, look more closely at the structure of Shapiro's model. X is a firm which sells a high-quality product and a, b, ..., n are its customers. They know that the product is high-quality because X has built up a non-salvageable asset, "reputation", on which it earns a quasi-rent. If the quality of the product is reduced, all the consumers will know this after a lag and they will not pay the quasi-rent any more. By violating its implicit commitment to sell a high-quality good, X would make an immediate gain but would dissipate ("milk") its "reputation". Since they understand this, consumers are confident that the product they buy is high-quality.

In this model, the fact that there are many consumers is completely irrelevant. We can replace them by one consumer, say A. Thus, the main relationship is a two-persons one between X and A. Hence, it resembles the relationship in Telser's model. However, in Shapiro's model, the immediate termination of the relationship after a violation of the implicit commitment is well founded while in Telser's model we saw that it is not. The difference results from two assumptions made by Shapiro. The first one is that firm X is in competition with other firms selling the high-quality product (hence, Shapiro's world cannot be reduced to an isolated two-persons relationship, but not for the reason which is generally thought of). As a consequence of this assumption, once the cost of the violation has been assumed, there is no opportunity cost for consumer A involved in turning to firms Y or Z. The gains from trade, or consumer surplus, that consumer A makes from the possibility of buying the high-quality good is not destroyed by the



termination of the relationship. In Telser's world (i.e. in a world limited to Robinson and Friday), it is. In other words, in Telser's model, both parties earn a quasi-rent from the relationship, while, in Shapiro's model, only the would-be violator does.

Let us assume that no other firm can sell the high-quality good. Then terminating the relationship with X implies for A the loss of his consumer surplus. But can he avoid this? In Shapiro's model, the answer is no, as a consequence of the second assumption we referred to: a "reputation" is definitively destroyed by a violation<sup>4</sup>. If we assume instead that the promise by X to sell a high-quality product, provided a quasi-rent can be earned ( a price premium can be charged), has some non-zero value for the consumer, then the termination of the relationship as a consequence of the violation is not warranted any more. We are not exactly back to the problem encountered when analyzing Telser's model, because we do not have any more to assume that past violations have no effects on present decisions, but we are still faced with the need to make more explicit what it is that deters violations of agreements.

Most sociologists or anthropologists who refer to reputation as a powerful mechanism for the enforcement of agreements or, more generally, of rules of behaviour, would not recognize what they have in mind in the preceding discussion. They would not accept the assertion made above, in the context of Shapiro's model, that the fact that there is more than one consumer is unimportant. The reason for this is that the violations of agreements they are concerned with are violations of a two-parties agreement by one party engaged (or potentially engaged) into other two-parties agreements. For instance, X is engaged (or potentially engaged) into agreements with a, b, ..., j, ..., n and violates only his agreement with j. In this case, again, if X has no competitor and "reputation" is not destroyed completely by one violation, there is no compelling reason to think that j will terminate his relationship with X. But, although not directly affected by the violation, the relationship of X with a, b, ..., n might be so indirectly, as a result of the reassessment by these individuals of the reliability of the promises that X made or could make to them. The total cost to X of these reassessments (we shall see more precisely later in what it consists) might be relatively high, in particular if information circulates rapidly, while the benefit from the violation of one

single agreement would normally be relatively small. Thus, reputation, in this sense, provides a powerful incentive against violating a single agreement (an agreement with one person), especially in societies where information can be assumed to circulate at little cost.

With the possible exception of what was said at the beginning on segmented strategies, the whole discussion of reputation up to now has been concerned with the reputation of the would-be violator. But we have seen that, in many contexts, an important difficulty for understanding self-enforcing agreements lies in the fact that the "victims" draw quasi-rents from their relationships with violators and consequently cannot be expected to terminate these relationship after violations agreements have occurred. When this applies, the threats they can formulate to deter violations are not credible. The reputation of the victim offers a way to make threats of termination credible. If  $j$ , the potential victim of the violation of an agreement with  $X$ , is also engaged into agreements with other parties, then having the reputation of terminating at any cost whatever agreement has been violated acts as a deterrent against cheating by these others parties (as a deterrent against cheating by  $X$  as well).

If we consider reputation in its various aspects, it is tempting to conclude from the preceding analysis that it is potentially a very powerful mechanism in favour of the respect of agreements that are not enforceable by third-party agencies. If we want to compare, however, the explanatory power of reputation with the explanatory power of trust such a conclusion would be unwarranted for a very simple reason: trust is already implitely included in the mechanisms through which reputation exerts it influence. In other words, what we have discussed is not in fact pure reputation as an alternative to trust: no theory of self-enforcing agreements founded exclusively on reputation (without the intervention of trust) is viable. But the reverse proposition is not true: reputation plays no role in many situations where trust is necessary.

### III. Trust

The compelling reference here is to the analysis of Breton and Wintrobe (hereafter BW) (see their [1982], chapter 4, and [1986-a] for a slightly modified formulation). But I shall

present things somewhat differently.

Largely inspired by BW's definition, I shall define trust as the probability assigned by one person to the respect of an un-enforceable (often implicit) promise made to him by another person or, by extension, to the respect of a set of (similar) promises made to him or that might be made to him in the future by that person<sup>5</sup>.

Armed with this new instrument, we can return to the isolated bilateral relationship we considered in the context of our discussion of Telser's and Shapiro's models. The effect of the violation of a promise made by X to Y is simply the lowering of the probability Y assigns to promises of the same kind made to him by X, i.e. a decrease in the degree to which Y trusts X for this kind of promises. In its turn, this will entail a decrease in  ${}_Y Y_X$ , the certainty equivalent of the present value of the services Y expects to receive from X. Normally, this entails that less will be offered in exchange for these services (but see below). Thus  ${}_X Y_Y$  diminishes also. If we disregard the possibility of indivisibilities, termination will occur at the initiative of Y only if the degree of trust of Y in X has been brought to zero. Thus, the cost to X involved in reneging on the promise he made to Y is a decrease in the present value of the net benefit he expects to draw from his relationship with Y. This cost is compared with the benefit of the violation.

In a world in which X has perfect competitors, we saw that it is not the consumer surplus but the quasi-rent drawn by the consumers from their relationship with X that counts. This quasi-rent is equal to zero, already when X is respecting his promise. When it reneges on it, its certainty equivalent becomes negative as a result of a decrease in trust, however small that is, and the consumers terminate their relationship with X. In a more realistic setting, for instance with costs of transaction, the quasi-rent drawn by the consumers from their relationship with X is positive as long as X respects its promise. When he reneges on it, the certainty equivalent of this quasi-rent decreases. It may or it may not become negative and thus termination may or may not follow.

Finally, in the case of reputation in the traditional sense, the knowledge by a number of

individuals interacting with X that he has reneged on the promise he made to one of them decreases the probability they assign to the respect of the promises he made, or could make in the future, to them. Thus, the value they give to these promises is reduced, they offer less in exchange for them. The cost to X of reneging on his promise to one individual is a reduction in the gains he draws from his relationship with all the individuals informed of his violation (including the direct victim of the violation). Thus, it is clear in this case that reputation works through trust, while, in a bilateral relationship, we can do without reputation and reason directly in terms of trust.

The foregoing analysis of trust seems straightforward enough. In fact, it raises two main problems. The first problem results from the fact that the level of trust we have in X's promise is positively related to  $\alpha_{XY}$ . We have argued that, after a violation of his promise,  $\alpha_{XY}$  decreases. However, increasing it might be a way for the victim to make new violations less profitable (in Breton and Wintrobe's terminology, the less we trust somebody, the more we have to invest in trust).  $\alpha_{XY}$  is a function both of trust (of Y in X) and of an autonomous decision by Y as to the quasi-rents (price premium) given to X. In its turn, trust (of Y in X) is a function of  $\alpha_{XY}$ . Thus a violation by X automatically reduces the trust Y has in X, but this can be restored by a higher price paid to X. But there is certainly a problem in having X rewarded for reneging on his promise. I may be wrong but I think that this problem is somewhat masked but exists all the same in Breton and Wintrobe's modelling of trust (see the chapter 4 of their book). They say that both X and Y invest in the asset (Y trusts X). X invests by renouncing the short-run gains of cheating and Y invests by (in our terminology) giving a quasi-rent to X (in their example, a reduction in interest rate). The problem is that a violation by X is a partial dissipation of the asset, but this asset can be restored by an increase in the quasi-rent. Observation confirms that people often do react in this strange way to violations of commitments by the other party. Far from retaliating, they offer more for keeping promises in the future. In an 18th century novel that has remained famous in France, Manon Lescaut, poor Chevalier des Grieux behaves exactly in this way with the very attractive but unreliable heroin.

A way to interpret such situations is to assume that X has some monopoly power while Y not only has none but has a demand that is inelastic (in the sense in which a Marshall offer-demand curve is inelastic) in the relevant range. Then, X unilaterally increases the price of his services (defined by  ${}_Y Y_X / {}_X Y_Y$ ) by violating promises and the victim responds by supplying more services. When the price reaches a level at which Y's demand becomes elastic, Y responds to further increases in price by reducing  ${}_X Y_Y$ , the quantity of services he is willing to give. But the optimal price for X will be reached only when X's marginal rate of substitution between  ${}_Y Y_X$  and  ${}_X Y_Y$  is equal to the slope of Y's demand curve. Of course, if both parties are perfectly informed and are fully rational, this equilibrium should be reached directly.

Why would X but not Y enjoy some monopoly power? In fact, in the context of bureaucracies, it can be argued that all vertical ties are potentially characterized by monopolies in the absence of horizontal trust and cooperation. To make the story as convincing as possible, without cost in plausibility, let us assume first that all bureaucrats are paid efficiency wages (see for instance Yellen [1984]), so that they have a strong incentive not to quit bureaucracy altogether, second that the subordinates of X cannot quit the particular bureau whose chief is X without his permission, and third that they find exchanging informal services with X important, for instance because he has the power to promote some of them to interesting positions or to assign each of them to very pleasant or unpleasant tasks. In such -not untypical- situations, horizontal ties between subordinates would be very valuable for them but will be very difficult to establish. It is clear then that X will tend to act as a monopolist and that it might not be unusual at all to observe the response of a subordinate (say j) to the violation of a promise that X made to him as consisting in increased quasi-rents promised to X (j works hard in view of a promotion promised to him by X, he is not promoted and works even harder).

However, it is also often the case that both X and Y have some power. In this case, Y would retaliate if X behaved in the way depicted above. This might lead to a "tariff war" and the disparition of exchange. Think of the daily relationship between a bureaucrat and his secretary

when both are tied together for some years as a result of organizational rules plus union supervision (again, not an untypical situation at all in the public bureaucracies which I know). If there is some asymmetry, it is usually in favour of the secretary. But, generally speaking, the context of this relationship is very much a Robinson and Friday one. Whether substantial cooperation will obtain is a question that brings us back to a large extent to the analysis of strategic interaction (a reciprocity rule might be effective in this case, but, thinking that they know better, both actors will probably start with more complicated strategies).

The second and even more important problem with trust (and hence with reputation), however, lies in understanding the way it is built up or dissipated. In BW [1984], the stylized story is the following. A lends 1\$ to B to with a small reduction in interest rate (compared to the one he would ask for loans in the same risk category); B repays the loan; as noted before, both have thus invested in the asset "A trusts B". Then, the operation is repeated with a supplementary reduction in interest rate, and so on. Each time the operation is repeated, the asset "A trusts B" is increased, although with diminishing returns. "After a certain point, they can trade with each other and both can be better off than in the absence of the asset "A trusts B" (p. 68)<sup>6</sup>.

There are several problems with this analysis. The first, less serious one, concerns the separation of the exchanges that are necessary for the building-up of trust and the "real" exchanges that are permitted by trust once it is built-up. This separation facilitates exposition but investment in trust should possibly be modelled more like learning by doing. The most serious problem is that, as depicted by BW, the accumulation of trust is blatantly inductive and thus subject to David Hume's famous characterization of induction as irrational. At one time, the dominant philosophy (logical empiricism, in particular as expressed by Rudolf Carnap) tried to save induction by the use of probability theory, an inductive proposition being "confirmed" (the probability of its truth being increased) by each positive instance and "disconfirmed" by each negative instance. This attempt is widely considered as having aborted and current philosophy is admittedly somewhat in disarray. However, a significant number of philosophers have adopted the Popperian view that we can do without induction, and in fact never use induction but instead

conjectures and refutations. Even if one does not fully adopt the Popperian view, it seems that one needs really a lot of confidence in induction to accept BW's story as a rational foundation for the accumulation of trust.

Since the existence of the phenomenon of accumulation of trust seems hardly a matter of discussion, I shall attempt in the next section to tell a story which could account for it. But, and this is the third problem in BW's account of building up trust, the two authors are not clear on why we need to bother with the accumulation of trust. They argue forcefully that we need to incorporate trust in our analyses of bureaucracy as an endogenous variable. And it is clear that most if not all the interesting results produced by their theory (see in particular their [1986-a] and [1986-b], as well as the work made with Gianluigi Galeotti) require an endogenous concept of trust. But this could mean that we need only to spell out the conditions for trust to be "high" or "low", or "higher" or "lower" (for the "organization of trust", as suggested by Coleman [1984]). Zero trust in all circumstances clearly leads to silly behaviour, even with perfect strangers. But we must know what are the settings which favour a high level of trust (e.g. the prospect of repeated and profitable exchanges) or a low level (e.g. very high incentives to compete). Trust could be endogenous only in this sense. Although they deny it (in particular by assuming an initial level of trust), BW sometimes give the impression that they want to justify the existence of trust in a world of narrow egoists ("takers"). Inasmuch as this is the case, two criticisms can be made. One is that an explanation of the existence of trust should probably be mainly biological. The other is that, inasmuch as trust is a conjecture (a theory), it is in need of no justification, as argued convincingly in my opinion by Popperians (see for instance Andersson [1984]).

#### Section IV. Interpersonal conjectures and the strengthening of ties

I tell here a story which accounts for the variation of trust although it is founded on the assumption that bureaucrats (as everybody else) use the hypothetico-deductive method to increase their knowledge (for a similar attempt in another context, see Boland [1982][1986]). Basically, this story treats trust as one product among many of a general mechanism. In his

interpersonal relations, what a person needs is to predict how the other person(s) will react to specified circumstances (including his own actions in these circumstances). The predictions are about trust if the person is interested in the probability of breaches of unenforceable promises; but his main concern may be different and, for example, call for predictions on reactions to threat, to coercion or to persuasion. In this section, I address two questions. How does trust vary as a consequence of a process of conjectures and refutations? How, in the context of bureaucracies, can one interpret the accumulation of trust? As we shall see, the two questions, although related, are not identical.

#### A. The variation of trust as a consequence of conjectures and refutations.

Bureaucrat A contemplates exchanging informal services with bureaucrat B. A forms in his mind ("how" does not matter) a conjecture or theory. I rule out pure curiosity and assume that the only thing that A is interested in is the prospect of exchanging informal services with B. Hence, the content of the conjecture is directly related to the nature of the exchanges that A wants to make with B. Its ultimate objective is to deliver predictions about reactions of B that are directly relevant for the realization of these exchanges. Thus the conjecture can be called instrumental, from which does not follow, as it has been argued by authors such as Boland [1979], that its truth is irrelevant [see Salmon [1983] and Mingat, Salmon and Wolfelsperger [1985], chapter 6]. Certainty about the truth of the conjecture is out of reach, but conjectures are necessarily falsified (by the modus tollens mechanism) if one of their implications is asserted to be refuted (the assertion is in its turn fallible in this uncertain and complicated world). If some implications are tested and come out "not refuted", the conjecture is corroborated. Through a process of conjectures, refutations, revised conjectures and so on, better (truer) conjectures are obtained. In a context of action (as opposed to a context of pure knowledge), it is advisable to act on the basis of the best corroborated conjectures available (some philosophers argue that there is a "whiff of inductivism" in this proposition, but see Watkins [1984], chapter 9). Consequently, although the predictions that interest him are those that have a bearing on his expected exchanges



with B (and this largely determines what should be in the conjecture), A is also interested in predictions that have no such bearing but makes it possible to test the conjecture. In other words, an instrumental conjecture should be neither too wide (this would be a waste of time for A), nor too narrow (it could not easily be tested, or only by testing the predictions on which A bases his decisions and that he certainly would not like to be refuted).

What kinds of (conjectural) assumptions should we find in A's conjecture? Without trying to be exhaustive or rigorous, let us single out three particularly relevant categories of assumptions (there are also assumptions on human behaviour in general, etc.). First, there are assumptions about the "personality" of B (e.g. his objectives, his degree of risk-aversion, his morality, his time preference). Then, there are assumptions about what we can call the "non-personality resources" of B (e.g. his position in the bureaucracy, the networks he is in, his enemies, the time he disposes of, the technical knowledge he has acquired). Finally, there are what may be called AB intercognitive assumptions: answers to questions such as "how does B see A?" or even such as "what does B think about how does A sees B?". To deal with the problem of endogeneity involved in such questions (A can influence the way B sees him and the way B thinks that A sees him), I assume that in "how B sees A" (as well as in the more complicated case), there are exogenous components (A can do nothing about it) and endogenous ones. I include only the first in the conjecture.

We can call "principal conjecture" the conjecture discussed so far. To it must be added auxiliary conjectures or assumptions. In particular, there are conjectures on the state of the world (about, for instance, the services that can be exchanged within and outside the particular bureau, the regulations, sanctions, level of monitoring prevailing in this bureau). Together, the principal and the auxiliary conjectures yield conditional predictions about B's behaviour. These conditional predictions have the form: "If circumstances are  $c_1, c_2, \dots, c_n$ , then the probabilities that B will do actions  $a_1, a_2, \dots, a_m$  are  $x_1, x_2, \dots, x_m$ ". They can be derived exclusively for the purpose of testing the principal conjecture or they can be directly the ones that are needed for A's

action; in the second case, we have already mentioned that no refutation is sought (although after the action has taken place they will serve as tests). Since discussing the difficult methodological problem of testing (in particular when the implications to be tested are expressed in terms of probabilities) would bring us too much afar, let us consider only the problem raised by the second category. The simplest case is when A contemplates making a single offer to B, with whom he has never had much relation before and has no intention to establish a more enduring relationship. Then, this offer can be simply included in the circumstances, say as  $c_i$ . But before making this offer, A can consider alternatives, say one alternative  $c_j$ . In that case, the prediction including  $c_i$  and the one including  $c_j$  are compared, and A selects the course of action which seems best.

If the relationship between A and B is to be more enduring, things become more complicated. The effects on A's and B's mutual perceptions of the history of the interaction must now be included in the conjectures made by each. But since these effects can be, to some extent, anticipated, they must be allowed somehow to influence the selection of the first moves. We shall not attempt to go into the details of the complicated dynamics that follows but will stress a few points.

First, each actor can try to mislead the other (influence the conjectures made by the other), by word and deed. This complicates matters but does not make less relevant the usefulness for each to get to the truth about the other. Word and deed of B are for A observations that his conjectures should account for; hence, they serve as minimum tests for A's conjectures (conjectures must at least "save the phenomena", although they should do more).

Second, in a similar way, how B behaves with other individuals is an important source of observations that the conjectures made by A on B should account for. If B behaves in a way that is "surprising", this constitutes a "refutation" of these conjectures, in the sense that they should be modified. In its turn, this affects the predictions on which A founds his behaviour towards B. Thus the reputation of B is important to A in the sense that it helps A discover the "true" personality of B (a point stressed by Colson [1974]).

Third, the foregoing analysis can explain why trust changes in the course of the relationship between the two individuals. But trust can change in both directions, it can be reduced as well as increased. Violations of agreements reduce trust if they are more frequent or serious than predicted and increase trust in the opposite case. The analysis can explain why trust of A in B accumulates only if we assume that A underestimates systematically B's trustfulness (although it can be argued that, in a competitive environment, individuals who are relatively un-trustworthy tend to be eliminated from exchange relationships and that, consequently, the long-lasting relationships that we observe are on average established between individuals who are relatively trustworthy). In other words, what the preceding analysis can explain is that, in the course of time, the two individuals have theories on each other that are better corroborated, but what it cannot explain is why they attribute higher probabilities to the fulfilment of their mutual promises.

In particular, the mere repetition of similar exchanges in a stable environment, while it does produce better corroborated conjectures (when implications have to be tested statistically), constitutes nevertheless a rather weak instrument for that purpose, superseded by the experience of more varied exchanges when it can be obtained. It is when we have observed an individual in different circumstances and moreover have exchanged with him varied services, that we feel we "know" him relatively well.

#### B. The accumulation of trust.

To explain the building-up of trust, we must complete the foregoing analysis by taking into account the quasi-rents that are created by the bilateral relationship in the course of time. Quasi-rents are mainly created because the cognitive process described above is both time-consuming and productive. Being an investment in specific knowledge, it builds up an asset which is clearly non-salvageable: if A terminates his relationship with B and turns to C, whom he does not know, his knowledge of B will be lost and new knowledge will have to be acquired.

Why is knowledge valuable? Firstly, better knowledge of B enables A to discover valuable

services that B can render him easily, as well as services which he can render B also at relatively little cost although they are particularly attractive and useful to B. Thus, thanks to improved knowledge of B, the productivity of mutual exchanges is increased. B's knowledge of A increases it further. Trust is not directly involved in this first reason for the usefulness of knowledge.

But, secondly, better knowledge of B gives A the possibility to make better and more detailed conditional predictions about B's reactions, and thus to desaggregate trust. Thus, after a while, A will know what are the services which should not be asked to B, even if the latter promises to render them (for instance no one who knows me well would ask me to post a relatively urgent letter, although I would always promise to do so on the first occasion). B will also learn in the course of time what are the kinds of violations of commitments to which A is particularly sensitive and thus will abstain from making such promises when he is not sure to respect them. Finally, A will be able to predict what are the changes in the external circumstances which may induce B to renege on his promises and will have the possibility to decide on this basis to seek only conditional promises. In sum, violations will become more predictable and thus will tend to be avoided. As a consequence, trust will be increased in the sense that promises for which B is not to be trusted will tend to be neither sought nor seriously made.

The increase in the course of time of quasi-rents (or the growth of the non-salvageable asset of which they are the counterpart) entails an increase for both A and B in the cost of the termination of their relationship. It also increases trust for the reason just explained. Thus, the cognitive mechanism exposed above seems more able than the non-explicitly cognitive mechanism proposed by Breton and Wintrobe (especially when presented in the form of their 1\$ loans example) to account for the accumulation of trust. However, it must be noted that increased quasi-rents, especially when symmetrical, decrease the credibility of the threat of a termination of the relationship. By itself, this encourages violations. With the increase in expected quasi-rents, the relationship between A and B resembles more and more the "Robinson and Friday" relationship whose problems we have already analyzed. To some extent, our cognitive mechanism suggests a way in which violations may be more easily deterred, when termination is not credible.

Increased knowledge of B allows A to make threats that are more exactly proportionate to the possible violations, for instance in the form of a refusal to enter into exchanges whose value to B he can predict. Of course, this argument has its limits. Counter-threats are also improved by B's knowledge of A and both exploitation and escalation remain possible (no analysis that excludes them should be accepted since they are so frequently observed).

The foregoing analysis has led to some changes in the foundations of exchanges of informal services in bureaucracies. In particular, reputation has been related to trust and recognized as potential important. Trust, and its accumulation, have been given a different explanation from the one proposed by Breton and Wintrobe. What are the consequences of these changes on the derivation of the main empirical propositions that confer so much relevance to the analysis of these authors? To answer this question, we would have to turn our attention to the varied nature of exchanges that take place in bureaucracies. Within the limits of this paper, it is impossible to do so seriously. However, in the next section, I shall consider, in the light of the preceding analysis, the particular case of "transbureau networks".

#### Y. The ambivalence of transbureau horizontal ties.

I call transbureau ties and networks those that are established between some subordinates in one bureau and some subordinates in other bureaus, or between the head of one bureau and some of the subordinates in other bureaus that are situated on the same hierarchical level. A characteristic of these ties or networks is that, despite the fact that they are clearly horizontal, the individuals who are involved in them cannot normally be in strong competition or rivalry with one another. In this sense, the establishment of transbureau ties is not subject to the main obstacle encountered by the establishment of other horizontal ties.

Breton and Wintrobe's most powerful and striking proposition is that horizontal trust is inefficient from the point of view of the superior. Does this apply to transbureau ties? In this section, I address first this question. Then, I spell out the characteristics of an important class of

exchanges within bureaucracy and suggest that they are particularly likely to take place within transbureau networks. Finally, I illustrate the importance of transbureau links by a short analysis of the transbureau networks that are found in the French higher bureaucracy.

#### A. The efficiency of horizontal trust as a function of vertical trust.

A problem in Breton and Wintrobe's thesis is that, from the point of view of a superior, there are clearly some gains as well as some costs involved in the cooperation of his subordinates. Think of the relationship between a sales department and a production department within a firm. If there is only rivalry and no cooperation between these two departments, the sales department makes promises to customers (e.g. on the date of delivery, or on tailored-made characteristics of the good) which can easily be sabotaged by the production department (see Padioleau [1986], pp.162-163, and the literature he cites). If there is high horizontal trust -and thus many exchanges of informal services- between these two departments or their chiefs, services to consumers can be improved. On the other hand, competition between the two departments or their chiefs (for resources and for the promotion of the chiefs) is a means for the superior to stimulate the efforts of both and to avoid a collusion between the two chiefs which could be directed against him. In Breton and Wintrobe's theory, horizontal trust (trust between subordinates) and vertical trust (trust between the superior and each of his subordinates) are essentially antagonistic, since the first implies the absence of competition that is required by the second. Although horizontal trust is necessarily ambivalent, Breton and Wintrobe show convincingly that it is on the whole inefficient, mainly because of its incompatibility with competition.

Let us assume that A and B work in two bureaus that are in a sense complementary (e.g. an accounting and a production department). The chiefs of these two departments are G and H. Their common superior is K. There is nobody above K, which means that what is efficient from his point of view is efficient from the point of view of the organization as a whole. A and B establish a network, founded on high mutual trust, and exchange informal services. This is not directly antagonistic with competition (as it would be in the case of a network between G and H) since

competition cannot exist anyway between A and B. The policies of G and H can be of two kinds. Some policies are competitive or conflicting policies, in the sense that they are instruments designed by the one against the other. Other policies are cooperative; they yield mutual gains to G and H. In their turn, the services that are exchanged between A and B can be divided into four categories. In category (i) are services that divert resources of the organization in favour of A and B. I assume that category (i) is unimportant since A and B are in two different bureaus. In category (ii) are services giving an advantage to A or B over their colleagues in the same bureau, say A' and B'. I assume that these services are important (see paragraph B below) but that G and H (and K) do not care. In category (iii) are services (for instance leaks) that undermine the conflicting policies of G and H. In category (iv) are services that enhance the cooperative policies of G and H.

Let us look at the reactions of G and H to the cooperation between A and B. If G and H cooperate rather than compete, I assume that they have only cooperative policies. Cooperation between A and B is efficient from their point of view (it saves time). If G and H compete, they have conflicting policies. But they also have cooperative policies. To see this, one must remember that competition between G and H is associated with high vertical trust between each of them and K. Hence, G and H are assumed to serve K's interest. But K's interest is that a certain amount of cooperation exists between G and H despite their rivalry. Thus, cooperation between A and B will be ambivalent from the point of view of G and H. Conflicting policies might be undermined but cooperative policies will be made more efficient. Now, if the level of vertical trust between G and A and/or between H and B is high, G and/or H will assume that A and/or B will know what should be exchanged between themselves and what should not. Consequently, vertical trust at this level will mean that transbureau cooperation is encouraged by G and/or H. If the level of vertical trust at this level is low, the opposite is implied.

From the point of view of K, there are four cases.

(i) The level of vertical trust is high all the way down, that is between K and G or H, between G and A and between H and B. Cooperation between A and B is efficiency-enhancing.

(ii) The level of vertical trust is high at the top (between K and G or H) but low at the bottom

(between G and A and between H and B). Cooperation between A and B is also efficiency-enhancing. It is inefficient from the point of view of G and H because it undermines the conflicting policies they design against each other more than it favours the cooperative policies that serve K's interest, but the value for K of the conflicting policies is zero or negative (they are either indifferent or represent the cost that he has to pay for the benefit he draws from the competition between G and H), while the value of the cooperative policies is positive.

(iii) The level of vertical trust is low at the top (there is collusion between G and H) but high at the bottom. Cooperation between A and B is inefficient. It reinforces collusion between G and H.

(iv) The level of vertical trust is low all the way down. Cooperation between A and B is also inefficient. It cannot undermine conflicting policies between G and H since there are none. Inasmuch as it serves their cooperating policies, it reinforces collusion.

In sum, if there is a high level of vertical trust between the superior and the bureau chiefs, transbureau networks are efficient, from the point of view of the superior. They are not if the level of vertical trust between the superior and the bureau chiefs is low. If we assume that the level of vertical trust at the top and the strength of transbureau ties are continuous variables, the foregoing propositions may suggest the shape of the isoquants (defined as identical levels of efficiency) represented on Figure 1.

[Insert Figure 1 about here]

#### B. Characteristics of an important class of services exchanged within transbureau networks.

I suggest that many informal services within bureaucracies (not only within transbureau networks) have the following characteristics:

- (i) The service cannot be predicted (neither its content nor the date of its occurrence, if ever).
- (ii) It costs very little to the one rendering it.
- (iii) It is of high value to the one receiving it.
- (iv) The same characteristics apply to disservices (negative services).

Why such apparently strange characteristics? Firstly, to a large extent, they are a



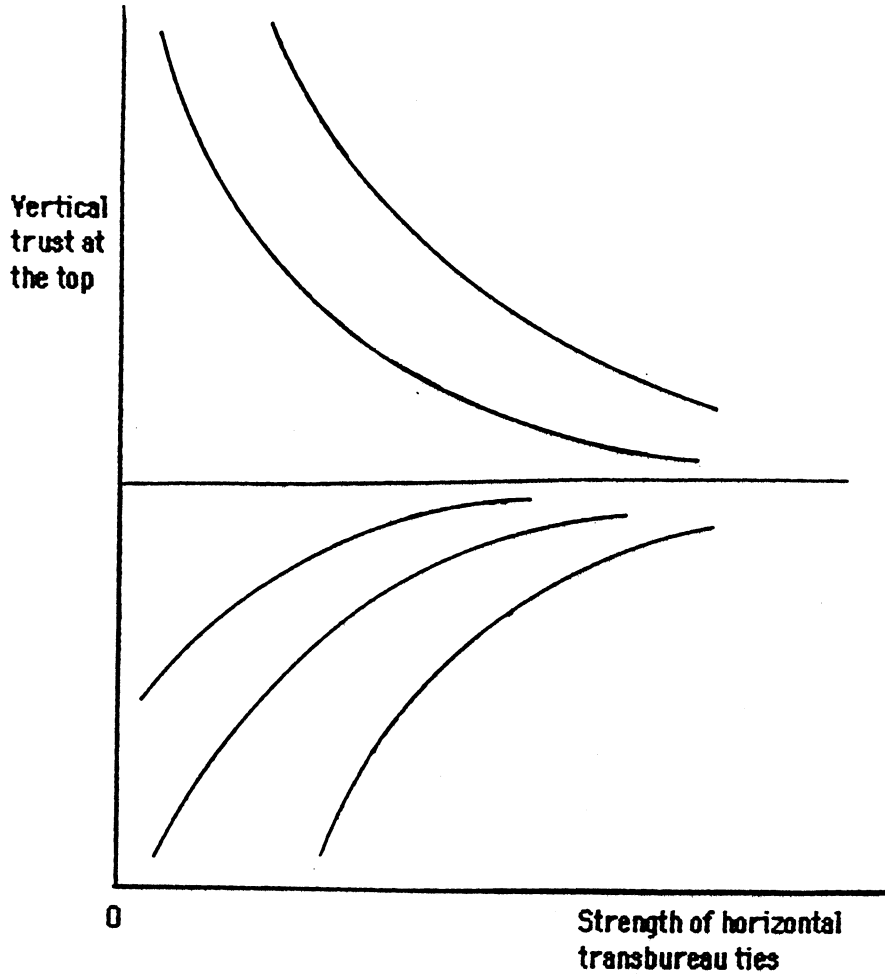


Figure 1.

consequence of the analysis that has been developed in the previous section on the accumulation of trust. If A knows B very well, he can recognize, when it occurs, the occasion of doing a lot of good or a lot of bad to B at little cost for himself. Typically, A takes the initiative; he gives without being asked. Let us make the extreme assumption that, within a given network, no services whose costs are high for those who render them are ever exchanged. This would not imply that no high-valued services are exchanged, if there are occasions. But, then, they would have the characteristics spelled out above. It is true of course that favours are asked. If B also knows A very well, this knowledge will help him in shaping his demand. But the cost to A will still, typically, be higher than when A takes the initiative; it might easily be too high. In other words, rendering services that are asked is usually more costly than rendering services that are not asked, although their value for the person to whom they are rendered is not necessarily higher.

Secondly, the cost involved in rendering services is often very low in bureaucracies because the bulk of it is externalized and because decisions are often collective. Let us consider the case of promotions. Promotions are not generally decided by one single superior who knows very well the persons concerned. They are made by committees or are made by decision-makers higher in the hierarchy than the immediate superior. They often involve moving from one bureau to another (the ambassador in Montevideo is promoted as first counsellor in The Hague). Now, let us assume that the question of a job to be filled is raised within a committee or in the context of a conversation in the office of a high-level bureaucrat. Then, for A, one of the persons who are present, just mentioning the name of B, usually entails little costs indeed (but see below), although it may change the whole career of B. If there is a cost involved in the appointment of B rather than C, the cost is born by other potential candidates and by the bureaucracy as a whole (if B proves in retrospect less efficient in his new job than C would presumably have been). The cost of expressing a doubt on B's capacity (it can be done without a single word) is usually not (much) more costly for A and may have the same drastic effect on B. Another example is information on contemplated policies (leaks). It has more or less the same characteristics. In both cases, of course, the initiative can be B's. But it is often the case that B does not even know that a policy is

in preparation or that the appointment to a job that suits him will appear as an item on the agenda of a meeting in which A will be present. In addition, as we saw, it often happens that A will do B a favour only if he thinks that its cost is low: whether this is the case, he is the only or the main one to know.

It is clear that the foregoing analysis is not very plausible when B is the subordinate of A. Then, the main private cost to A of rendering a service to B is the opportunity cost of not rendering that service to C or D, on the same level as B. This opportunity cost can be high. Thus, I think that the peculiar characteristics of the services considered in this paragraph are mainly (but not exclusively) to be observed in the case of transbureau exchanges (in particular those that correspond to category (ii) in the preceding paragraph).

Even within transbureau networks, many exchanges do not have the characteristics presented above. But services which do have these characteristics generally remain in the background of the stronger relationships, as a possibility of which the two parties in the most costly agreement are well aware. This a powerful additional force against the termination of cooperative relationships. One never knows, in the hard world of bureaucracy, whether the other party might not be sometimes in the position, at practically no cost to himself, to do one a lot of good or a lot of bad. Thus, although the services whose characteristics we have emphasized tend to favour the establishment of weak (and numerous) ties (on weak ties, see Granovetter [1974?] and Boorman [1975]), they also affect the shaping of strong, more exclusive, ties.

### C. The example of transbureau networks in the French higher administration.

In France, the recruitment of high-level bureaucrats is largely based on a severe selection at the graduate level. Bright young graduates are admitted as civil servants to a number of very exclusive Grandes Ecoles. They spend there a couple of years and are admitted as members to one of the Grands Corps (hereafter GCs). The most prestigious among these are the Ingenieurs des Ponts et Chaussées, the Ingenieurs des Mines (misleading names in both cases), the Inspecteurs des Finances, the members of the Cour des Comptes and the members of the Conseil

d'Etat. In the first two cases, undergraduate studies take place at (the Ecole) Polytechnique, itself highly selective, and those who come out of Polytechnique among the first generally choose to go to the two "applied" schools. In the case of the last three GCs, graduate studies take place at the Ecole Nationale d'Administration -or ENA- (itself highly selective), and those who come out among the first usually choose one of the three GCs. Thus, the first two GCs are in reality nested in the much larger Polytechniciens network, while the three others are nested in the much larger ENA network. However numbers count. The total annual recruitment in the five GCs is probably only a tenth of the annual flows coming out of Polytechnique and ENA. I assume in what follows that, typically, a GC has a few hundred members.

Other features of GCs must be mentioned. Many members leave the public bureaucracy after some years for jobs in politics and in public or private firms. However, they remain members of the GCs (in practice if not officially). When they are in the public bureaucracy, they usually do not stay for extended periods of time in the same bureau and not even in the same ministry (although a GC has a natural habitat or stronghold in one ministry, to which members can always return if they wish). Mobility is very high. Higher level positions in the public bureaucracy are occupied partly by members of GCs and partly by other bureaucrats (nothing is required for becoming a director). Many qualifications and additional features should be introduced for the sake of accuracy and of completeness, but this will do for our purpose.

GCs are typical transbureau networks, very much alike the dispersed clans that are analyzed by some anthropologists (see, for instance, what Colson [1974] says on cross-cutting ties). The obligations of a member are the following. Firstly, he must, whenever he can, help other members find a rewarding job. In practice, this means that well-placed members must help less well-placed members to find jobs (not necessarily as subordinates). Secondly, each member must render small services to other members if they do not cost much (e.g. answering calls or transmitting information). Thirdly, the GC itself must be defended if it is menaced (by increased numbers or by restriction of its prerogatives). Finally, each member must concur in sanctions against "traitors". It must be noted that reputation, as in the small clans studied by the

anthropologists, is a very important mechanism here.

From the standpoint of its members, GCs are very efficient networks. They have the optimal size (and are kept so). If they were smaller, it could not be assumed that there is always a sufficient number of members who are well-placed and consequently the security the GCs offer their members would be diminished. But they are small enough for members to know each other fairly well; rendering services to others is not too fastidious for those who are well-placed; competition for rewarding jobs takes place essentially with non-members since, in comparison to the size of each GC and even to the aggregated size of the five GCs, there are plenty rewarding jobs available in the bureaucracy as a whole, in politics and in firms. The efficiency of the GCs would be reduced if they attempted to defend particular policies or if their political loyalties were not divided. They would not be tolerated by politicians or by the rest of the bureaucracy. But, actually, political loyalties are split among the main political parties and freedom of thinking on matters of substance is allowed (if members of a GC often tend to think along the same lines on many matters, it is because they usually have the same background and because their training gives them a bias towards conformism, but dissenters are well tolerated). The fact that all the main political loyalties can be found in a GC means that there will be well-placed members whatever the majority in power. Thus, when the government changes, some well-placed members lose their position but other members get to the top (not necessarily in the same jobs).

Are the GC networks efficient from the point of view of superiors? Since these GCs have been there for many centuries, during which France has gone through numerous revolutions and political regimes, it is probable that superiors find advantages in their existence. Actually, all depends on the level of vertical trust that is established between superiors and those among their subordinates who are members of GCs. An obstacle to vertical trust lies in the great independence that is provided by membership in a GC. Members are like "barons" in Tullock [1965]'s account of bureaucracy. They do not risk much, whatever happens. However, normally, a superior can easily get rid of a member of a GC. The GC does not fight to maintain its members in their present jobs. The superior can even hope to replace the member of a GC by another member of the same GC.

In any case, the superior has a strong incentive to have members of GCs among his subordinates and to establish vertical trust with them. If he succeeds, he benefits from direct links with almost all the important bureaus and public or private firms, as well as with some politicians. In practice, all ministers try to have members of GCs among their close collaborators, and if possible one of each GC (only the most important ministers can get that). Thus, except for the short periods of time that follow the coming into power of completely fresh and innocent politicians (and, with them, of many equally innocent directors), vertical trust is typically high between superiors and members of GCs, and consequently GCs are efficient.

#### VI. Conclusion.

Three main points have been made in this paper. To start with the less important, it has been argued that reputation can be a powerful mechanism for the support of self-enforcing transactions within bureaucracies, but that this effectiveness does not diminish the role played by trust since reputation implies trust. Then, a mechanism for the building-up of trust or the strengthening of ties inspired by the Popperian theory of knowledge has been proposed as an alternative to the model presented in Chapter 4 of Breton and Wintrobe [1982]. Finally, efficiency-enhancing horizontal trust has been shown to be possible in the case of transbureau ties, and most likely to prevail if vertical trust is strong. As revealed by the title of the paper, it is not argued that these various contributions are perfectly interrelated, but some links exist.

#### Notes

<sup>1</sup> On this, in addition to Breton and Wintrobe [1982], see Breton and Galeotti [1985], Breton and Wintrobe [1986-a] and [1986-b], and Galeotti and Breton [1986].

<sup>2</sup> See, for instance, Friedman [1983], pp. 124-135 and 222-226, for a simple explanation of the nature of the problem of non-credible threats in the context of oligopoly theory and of its relationship with the notion of perfect equilibrium introduced by Selten in 1975.

<sup>3</sup> In the field of macroeconomic policy, although recent experience constitutes an incentive to think in terms of policy rules rather than policy decisions, a crucial objection is precisely that we cannot rule out the influence of new knowledge or new circumstances.

<sup>4</sup> We can note that, even under Shapiro's assumptions, including competition and free entry, the

definitive termination of the relationship is not realistic since the firm can re-establish its reputation in the course of time, or do it indirectly by transforming itself into another firm.

<sup>5</sup> An inconvenient of this definition is that it implies that we cannot decide to trust.

<sup>6</sup> We can note in passing that the assertion formulated by BW that nothing is implied by this mechanism as to the asset "B trusts A" is not completely convincing : the sacrifice (investment) made by B for the sake of building up the asset "A trusts B" is giving up cheating; it is made on the basis of the prospect of the quasi-rents that he will earn in the future if he remains trustful, hence on the basis of an implicit promise by A to make more business with him. Consequently B must trust A from the moment when he gives up cheating on the first loan and there is not much reason to understand why his trust in A does not grow, with a lag of one period, parallelly with the trust of A in him.

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