Politically Correct Information Adoption

By Håkan Holm

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Abstract: This paper analyses the case when the political struggle not is channeled through policy choices, but through what information to adopt. The paper presents a simple model to analyze collective decisions of adopting new information when different parties' payoffs are contingent upon the new information. In equilibrium we demonstrate that the adopted information is biased towards "political correctness" rather than being informative (in the Blackwell sense). These results may be relevant when designing decision mechanisms for institutions that are to be keen on new information.

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* Associate Professor at the Department of Economics, University of Lund, Box 7082, 22007, Lund, Sweden. Phone: +46-46-2229551, Fax:+46-46-2224613, e-mail: hakan.holm@nek.lu.se. This paper was presented at the 1999 annual Meeting of the Public Choice Society in New Orleans. Support from Jan Wallander's and Tom Hedelius' Foundation for Research in the Social Science and Forum för Rättsekonomi are gratefully acknowledged.

1. Introduction

It is well known that the willingness to adopt new information is a very important aspect behind the growth in the market oriented economies around the world. Economic theoreticians have also long ago pointed out that this process also involves destruction of old industries and painful adjustments for many parties.[1] Still, the adoption of new relevant ideas continues since it is a prerequisite for surviving in the market. As a consequence, the question *if* competitive firms adopt new information have been superfluous. The question that has attracted research can instead be formulated as *how fast* do various firms and industries adopt new relevant information.[2] However, in the case of non-profit-maximizing organizations we argue that that the *if* question is highly relevant. The reason is that when decision makers' payoffs are affected by other things than the residual income of the organization, they may have strong incentives to block the arrival of new information.

Let us introduce two neglected aspects that we think are important in how institutions adopt information. First the institutions' acquisition of information has economic consequences that to a certain extent can be foreseen. Secondly, those affected by new information often have the possibility to affect its adoption. We do not primarily think of such drastic methods such as keeping things secrete or to refuse disseminating certain information, but more indirect methods that may delay or hinder the official adoption of information. In many situations new information concern complex phenomena that never can be known at certainty. As a consequence it is usually (possible for somebody that is looking hard enough) to find weaknesses in studies of these phenomena. By pointing at the weaknesses or by demanding additional studies of the phenomena it is possible to cast doubt about the results or to postpone that they are officially adopted in a way that most of us (less informed) regard as

[1] See e.g., Schumpeter (1912).
[2] See e.g., studies of technology diffusion like e.g., Mansfield (1961).

perfectly legitimate. These two aspects imply that there are situations, where the members of an organization not only know in which ways the official acceptance of information will affect them, they also have means of avoiding it.

The institutions' adoption of information affects the overall economic efficiency. For instance, if we get the information that certain consumption activities are hazardous we can simply avoid them. Adoption of new information then improves our possibilities of maximizing our expected utility and hence the efficiency. However, often the impact of new information may take longer time and is internalized through market prices. For instance, consider a house market where new (true) information states that wooden houses are more risky than stone houses, since the former house type is more likely to burn down. In the perspective of the house owners, the decision to make this an official "truth" can be described as a zero sum game in the short run; wooden house owners lose on the new information since the value of their houses decreases and the stone house owners gain. However, in the long run the stock of houses is not constant since new houses are built and old houses are replaced by new ones. Ceteris paribus, the new information would cause the proportion of wood houses to drop in the long run. Through these mechanisms the fire risk for an average house would also drop and the efficiency in the society would increase.

The aspects mentioned above motivate an attempt to study the problem of information adoption in a strategic environment, where the organization's decision to adopt information is endogenous and affected by different parties self interested strategic considerations.

There are a limited number of studies that focus on the less obvious intricacies in the individual agent's problem of adopting information. First, there are a few studies inspired by Festinger's (1957) psychological theory of cognitive dissonance, where individuals minimize inconsistencies between cognition (or adopted information) and actions.

According to this theory beliefs as well as actions can be changed to reduce the dissonance, which may have important consequences for economic decision-making as been noted by Akerlof and Dickens (1982) and Giliad et al. (1987). Secondly, there is a literature including Levin and Ponssard (1977) and Holm (1997), where the strategic situation motivates fully rational agents to be uninformed.

There are also a limited number of studies focusing on collective information acquisition. Austen-Smith and Riker (1987), and Austen-Smith (1990) analyze information transmission through debates. Gilligan and Krehbiel (1989), and Lohman (1994) study information acquisition and disclosure in asymmetric information models. Furthermore, Gersbach (1995) characterize the equilibria in a two-stage voting model where agents may invest in information before they vote. Gersbach shows that information efficiency is not always socially optimal. In contrast to these studies the present study takes the starting point in that information adoption and policy choices are closely related at the organizational level.[3] To focus on the information acquisition, we let the "political struggle" about policies entirely be channeled through the organization's decision to adopt information. Furthermore, to characterize the information that will be accepted or rejected in more narrow terms we make use of an information concept that allows for this.[4]

It is conceivable to perceive our model as a building block for a cognitive dissonance theory for organizations that are based on self-interested rational individualistic choices. The fundamental hypothesis is that information that cannot be made consistent with rules and actions of the organization will not be (officially) adopted.[5] Hence, only information

[3] Thus, in our model the individual face the problem of voting in favor or against that his organization shall adopt a certain type of information. The individual's personal information acquisition problem is not addressed in our model.

[4] Our model also differs from the other papers in some other important respects, for instance, we use a symmetric information structure and cost-less information.

[5] The social component in economic cognitive dissonance models has been noted by Rabin (1994), who argues that feelings of dissonance can be reinforced or dampened depending on others having the same or different moral standards.

that can get sufficient member support to alter the organization's behavior will be accepted without causing dissonance.

The Outline of the Paper

The paper is organized as follows. We start out in section 2 by specifying some of the problems involved in the process of adopting information and how we are going to model the problem. Here we also give some examples on situations where the problems we discuss are applicable.

The concept of information is a relatively vague concept in that different persons may have different opinions about its meaning. This means that a general analysis of "adoption of information" would lead to ambiguity if it is not made clear what "information" stands for. In section 3 we try to overcome this problem by modeling information as statistical information in the sense of Blackwell. Admittedly, this restricts the analysis somewhat. On the other hand this choice can be motivated by the fact that in many cases new information take the form of imperfect statistical data. In addition, this way of modeling information is fairly established.[6] The analysis reveals that for information to be adopted in the first case it must describe “the world” such that, if actions were taken on the basis of that description, the majority would gain. We might say that information that is not "political correct" will be filtered out in these organizations, which is inefficient since potentially valuable information will not be taken into account. This result can be regarded as a new interpretation or "framing" of Black´s (1948) median voter theorem in the context of information adoption. Whereas the outcome in the median voter theorem is described in some policy dimension over

[6] See studies that use this concept e.g., Blackwell (1953), Radner and Stiglitz (1984), Kandori (1992), Bassan and Scarsini (1995).

which the voters have given preferences and information, the outcome in this analysis describes the characteristics of the information that are politically acceptable given that it has distinct policy implications.

2. The Problem

We will consider problems where a group of agents collectively make a decision of whether to adopt new information or not. If the information is adopted it will have consequences for the agents' payoffs.[7] Information adoption occurs when a critical mass of agents are willing to accept the information and thereby (through the given decision mechanism) are able to govern the organization to take actions based on the new information.

To fit our general characterization above it is natural to think of situations where there is a considerable amount of uncertainty and where additional information arrives as the experience grows. Mutual risk sharing is one example of such a situation. It has been argued by Skogh (1999) that mutual risk-sharing can be regarded as an institutional response to genuine uncertainty. As experience grows the information about risks will get more accessible and contractual solutions (designed by new institutions) can be based on the new risk assessments. Our house example below can be considered as a situation where the initial information about the risks is relatively primitive and where the new imperfect information provides the organization with potentially valuable experience.

[7] Hence, we restrict our analysis to the kind of information that has a potential value in that agents may take actions based on it to change the organization. The question of whether individual agents really believe in the information or not is left open. They might believe in it or they might not and chose to accept a certain view since they will gain on it.

Example 1: Mutual risk sharing: Suppose that a group of house owners have formed a mutual risk-sharing pool in order to reduce their individual risk exposure to fire damages.[8] Assume that the pool only consists of owners of wooden houses and stone houses. Furthermore, assume that somebody presents new data suggesting that the probability for a stone house to burn down is less than the corresponding probability for a wooden house. If this information is adopted it is reasonable to assume that the premiums in the pool will be adjusted so that each member pay their expected damage cost. Hence, premiums for wooden houses would increase relative to stone houses. The decision to adopt and implement such information is typically a majority decision where all members may participate (e.g., the annual meeting) or by a representative subset of the pool members (e.g., a board) that reflects the pool's composition of agents.

The example above is chosen for its simplicity rather than for its current actuality. More recent examples include risk-sharing pools in national industries and internationally between states.[9] The rules of these associations are typically the result from negotiations among the pool members. The possibilities to make alterations in the statues are more or less difficult and may require qualified majority or full consensus.

The risks considered above are more or less associated with privately owned objects. However, our analysis can also be applied to institutions dealing with collective risks, where the parties have different costs for the risk.

Example 2: *Environmental Problems:* The last decades many research reports have expressed concern that various green house gases are about to cause a global climate change. Although, uncertainty remains concerning what the exact effects would be from a global climate change

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[8] See Hägg (1998) for an analysis of early mutual risk sharing arrangements in Sweden concerning fires.
[9] One example is the conventions between nuclear power states. See e.g., the "Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963 " at http://www.iaea.org/worldatom/updates/annex1.html and the

and concerning what the most efficient preventative measures are, there seems to be a certain consensus among experts concerning certain effects and certain preventative methods.[10] For instance, as the global temperature rises the water level is expected to increase. As a consequence there is a probability that some low lands that currently are just above the water level will be flooded. For this reason (and a lot of other reasons) although global climate change will affect us all, the effects (and hence the cost) will be more serious for some countries than for others. For instance, countries with a large fractions of its territory lying in the low lands and/or that are situated in the tropical or subtropical climate zones face more serious effects.

There are also a number of risk factors that produce the global climate change. The short term cost for a country to help preventing a global climate change will depend on what factors prevention should focus on. For instance, if prevention concentrates on carbon dioxide emissions, those countries with an industry structure and energy system that highly relies on fossil fuels would have the highest prevention costs. The global climate change calls for an internationally coordinated environmental policy based on the available information from the scientific community. However, before such a policy can be efficiently implemented, the international community must agree upon what scientific information to take into account. This may not be easy since different countries have different incentives. Whereas some countries may be very anxious to attack the problem since the climate change would cause them great harm, other countries that have little reason to worry may be unwilling to implement costly preventive policies before they are absolutely certain about the mechanisms involved. In addition to this, new information about risk factors that have implications for the

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"Convention on Supplementary Compensation for Nuclear Damage" at
http://www.iaea.org/worldatom/updates/annex2.html.

[10] See, however Lomborg (1998) for a critical discussion and statistical analysis of the World Watch Reports.

countries' prevention costs may be blocked by coalitions of countries that would be negatively affected if international conventions and policies were based on that information.[11]

3 The Analysis

3.1. Imperfect Information

By information different people mean different things. To get our analysis stringent we shall present how we model information in this section.

In many cases information about uncertain phenomena is not perfectly discernable, which means that some kind of statistical method must be used. The probabilistic aspects of such a method are captured by a message service. [12] We will consider the simplest type of message service that emits one out of two possible messages concerning each agent's type, where one message is favorable and the other is unfavorable. We will assume that the agent's type is associated to some underlying cost function and that each agent is either a high cost type or a low cost type. A message service can then formally be represented by a likelihood matrix, $L = [q_{\theta \bullet m}]$, where $q_{\theta \bullet m}$ represents the probability that the message is $m \in \{1,2\}$ if the agent is of type $\theta \in \{1,2\}$. Let 1 denote the low cost type and favorable message and let 2 denote the high cost type and the unfavorable message, respectively. To get an intuition for these notions we will apply them on *Example 1* above.

[11] In the light of this, the watered down results of the United Nations Conference on Environment & Development in Rio 1992 should not come as a surprise. For instance, in the chapter describing Protection of the Atmospere in Agenda 21, the most concrete action suggested is the generation of additional scientific information (see gopher://unephq.unep.org/11/un/unced/agenda21).

[12] For an introduction to message services and imperfect information see e.g., chapter 5 in Hirshleifer and Riley, 1992.

Let us assume that the true fire risk for houses depends on a large numbers of variables that are difficult to observe or measure. However, building material is one variable that give some but not all information about the risks. Now, for simplicity assume that there are only two true types of houses: low risk houses and high risk houses.[13] However, the information to distinguish the true low risk from the high risk types is not accessible for the agents. Thus, they are symmetrically unaware about the true types. Suppose that new information states that 60% and 40% of all true low risk houses are built by stone and wood, respectively. This means that $q_{1*1} = 0.6$ and $q_{1*2} = 0.4$. The new message service also states that 30% of the true high risk houses are stone houses and that the corresponding figure is 70% for wood houses. We then have that $q_{2*1} = 0.3$ and $q_{2*2} = 0.7$. Note again, that although we assume that everybody has access to this statistical information (i.e., the agents have symmetric information about the message service), nobody can be certain about the true type of a given house, since the information is imperfect. A more formal way of saying this is that $0 < q_{\theta \bullet m} < 1$ for all θ and *m*.

Two unconditional probabilities are critical in determining the probability that the agent (or in the example above, the house) is of a certain type given a certain message. The first is the unconditional probability that a given message is received and the second is the unconditional probability that a randomly selected agent is of a certain type. Denote the former by q_m (for message *m*) and the latter by π_θ (for type θ). Suppose in the example above that the risk sharing pool consists of 40 stone houses and 60 wooden houses. Hence, since the message concerns building material the probabilities that a randomly selected house is made in stone and wood are then given by $q_1 = 0.4$ and $q_2 = 0.6$, respectively. Although, π_θ is not directly given it can be computed with the information given above, since we know that for

[13] Clearly, low risk houses correspond to the low cost type and the high risk houses correspond to the high cost type.

40% percent of the houses the message is stone house and that the stone houses can be divided into low risks and high risks. Thus, if we knew π_θ we could apply the values on $q_{\theta \bullet m}$, since consistency requires that $q_1 = \pi_1 q_{1\bullet 1} + (1-\pi_1)q_{2\bullet 1}$. Plugging the values into this expression we get $0.4 = \pi_1 0.6 + (1-\pi_1)0.3$ and $\pi_1 = 1/3$. Thus, 1/3 of all houses are (true) low risks and 2/3 are (true) high risks.

The agents can now use this information to improve their predictions about the houses' risks. According to Bayes' rule the probability that a randomly selected agent is of type θ contingent upon that message *m* is received is given by $\pi_{\theta \bullet m} = \pi_\theta \, q_{\theta \bullet m} / q_m$. Thus, the probability that a stone house is a (true) low risk object is $\pi_{1\bullet 1} = 1/2$ and the corresponding probability for a wooden house is $\pi_{1\bullet 2} = 2/9$.

In the following, we shall use the convention that $\pi_{1\bullet 1} \geq \pi_{1\bullet 2}$ and that $\pi_{2\bullet 2} \geq \pi_{2\bullet 1}$ (i.e., the probability that an agent is a low cost type is higher if the message is 1 than if it is 2, and the probability for the agent to be a high cost type is higher if the message is 2 than if it is 1). This means that if someone wants to form a risk sharing pool with low risks he will only accept a prospective member if he is associated with the favorable message (i.e., message 1).

The Model

We shall mainly confine the analysis to a situation, where there are only two true types. Thus, there are n_1 and n_2 low and high cost agents respectively, where the total number of agents is $n = n_1 + n_2$. The expected net costs of a low cost agent and a high cost agent are *a* and *c*, respectively. The total cost of the organization will then be $n_1 a + n_2 c$. Without any additional information about the types we assume that they will all pay the same amount. To satisfy the budget constraint each will pay a premium equal to $(n_1 a + n_2 c)/n = a\pi + c(1-\pi)$, where $\pi = \pi_1$. (Note that with random selection we have that $\pi = (n_1/n)$.)

Below we will study the organization's decision to adopt new information. If new information is adopted the premiums will be set consistent with the adopted information.[14] With some exception we will confine the analysis to message services containing only two messages. The expected cost (and the premium) for an agent associated with message *m* is then $E(C_m) = a\pi_{1\bullet m} + (1-\pi_{1\bullet m})c$. If the information is not accepted the agent will receive the status quo payoff.

We have now described the main components of our model and its time structure is illustrated in Figure 1. There are three phases; a presentation phase, a decision phase and finally a payoff phase.

3.2 The Cost of Imperfect Information

It is fundamental in economics that decisions should be based on expected costs given all available information. If not, too much will be produced of those goods and services that are priced below their true expected costs and too little will be produced of those goods that are priced above their true cost. In the case of perfect information a favorable message would point out the low cost agents with certainty (i.e., $\pi_{1\bullet 1} = 1$ and $\pi_{1\bullet 2} = 0$), and the unfavorable message would only be emitted for high cost agents (i.e., $\pi_{2\bullet 1} = 0$ and $\pi_{2\bullet 2} = 1$). If such a

[14] Clearly, there are different ways to design sharing rules. However, we think that it is reasonable to assume that everybody in the pool and pay fair premiums according to whatever information about the costs that the pool has adopted or accepted. One reason for this is that a different sharing principle would create dissonance in the organization. For instance, it is easy to imagine that "tensions" would be created if everybody received the same

message service was available the agents could exactly pay their expected costs (i.e., the low and high risk types would pay *a* and *c*, respectively)

As we will analyze imperfect information situations, it is important to be able to order different degrees of "imperfectness" in information. In fact, this is possible to a certain extent. Following the literature on information economics we will say that a message service μ' is more informative than a message service μ if $\pi'_{1\bullet 1} > \pi_{1\bullet 1}$ and $\pi'_{1\bullet 2} < \pi_{1\bullet 2}$ holds.[15] An important consequence of this is that a more informative message service will reduce the average mistake in assigning costs to the agents and therefore lead to higher economic efficiency.[16]

3.3 Criteria for Adoption of New information

From the reasoning above we conclude that it is efficient for the institutions to adopt informative message services. We will now study two institutional arrangements to see how they perform with respect to information adoption.

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payoff from the organization at the same time as it was an "official truth" that there were clearly defined groups with different levels of net inputs (or productivity).

[15] See Hirschleifer and Riley (1992) chapter 5.

[16] Let us illustrate this cost of mistakes by a simple estimation and call the associated cost for the average cost bias (β). To estimate β for a given message service note that since the true types are unknown under imperfect information the expected cost for an agent associated with message *m* is $E(C_m)$. Now, if the agent really is a low cost type he pays $E(C_m) - a$ too much and he pays $c - E(C_m)$ too little if he is a high cost type. Thus, the expected size of the mistake for an agent receiving message *m* will be $\varepsilon_m = \pi_{1\bullet m}(E(C_m) - a) + (1 - \pi_{1\bullet m})(c - E(C_m))$ and the overall average cost bias will then be $\beta = q_1\varepsilon_1 + q_2\varepsilon_2$. Clearly, with perfect information the average cost bias is zero. If we compare two imperfect message services for which the unconditional prior probabilities are the same, then the more informative message services will have the lowest average cost bias. To see this, one could imagine a central authority with a payoff function negatively related to the average cost bias and apply the analysis in Hirshleifer and Riley (1992) chapter 5.

The Competitive Market Solution

To understand the political restrictions in information adoption it is instructive to start the analysis by asking how firms in a competitive market would adopt new information. Let us delimit the case to a market for the fire risks described in Example 1. Note that since we do not assume any informational asymmetries and since the labels (i.e., the "stone house" or "wooden house") are assumed to be common knowledge, we can expect that with risk-neutral insurers competition will force the market to adopt all information that can be used to differentiate the premiums according to the risk categories. The reason for this is that the insurance firms have incentives to base new contracts on the new information. Thus, in equilibrium everybody pay their expected damage cost based on the available information.

To see this assume that the true yearly expected damage cost for low and high risk houses are 1500 and 3000, respectively. Since one third of all houses are low risks and two thirds high risks the premium without any information should be: (1/3)*1500 +(2/3)*3000= 2500. Now, if the information that the building material affects the fire risks in the way described above, some firms will be tempted to offer a more attractive contract to stone house owners. Since half the stone houses are low risk the competitive premium will be: (1/2) *1500 + (½)3000= 2250. The stone house owners will accept this contract and thus pay their expected damage cost which will generally given by $E(C_m) = a\pi_{1\bullet m} + (1 - \pi_{1\bullet m})c$. This means that information is used as long as some subcategory can gain on its use (i.e., receive lower premiums). As a consequence the available information on damage costs are internalized in the premiums and will be taken into account when new houses are built. We can then make the following standard observation.

Observation 1: *Any information that can be used to improve the differentiation of subcategories' expected costs will be exploited in a competitive equilibrium.*

Majority Rule

Let us now study the decision to adopt new information in organizations governed by the majority rule.[17] If the agents maximize their individual utilities and only consider the expected cost in various situations we can conclude that new information is adopted if and only if more than the required majority gain if it is exploited. For instance, without any information about building material all house owners (in Example 1) share the risk equally so that each member pays the average expected cost, i.e. 2500. However, if the information about building material is adopted according to an expected cost based sharing principle the stone house owners should pay: $a\pi_{1\bullet 1} + (1-\pi_{1\bullet 1})c = 1500 * 1/2 + 3000 * 1/2 = 2250$ and the wood house owners should pay $a\pi_{1\bullet 2}(1-\pi_{1\bullet 2})c = 1500 * 2/9 + 3000 * 7/9 = 2667$.

What is then the criterion for adoption of new information? As we shall see below the adoption of information is contingent upon if the message service assigns a set of labels that are favorable to the required majority.

Observation 2*: In the case of two types and two messages the condition for adopting new information requires that the profitability and majority constraint below are satisfied:* [18]

i) Profitability: $\alpha > a\pi_{1\bullet 1} + (1-\pi_{1\bullet 1})c$ *, where* α *denotes the status quo premium (i.e., the premium paid without new information).*

ii) Majority: $q_1 > s$ *, where s is the required majority. (In the case of simple majority,* $s = 1/2$ *.)*

[17] We assume that it is not possible or prohibitively costly to exit.
[18] Remember that message 1 is assumed to be the favorable message.

These conditions describe acceptable information in terms of the parameters of the message service. Note that these criteria are not connected to efficient adoption of information. Newly adopted information may be either informative or uninformative, which means that the expected cost of mistakes may decrease or increase. We generalize this result for information described by message services with an arbitrary number of types and messages in Appendix 1. In the same appendix we show that the spirit of Observation 2 also is carried over to the case where the status quo payoff differs among groups.

If we apply Observation 2 on our house example and assume the simple majority rule, it should be clear that the information about building material will not be adopted in the risk sharing pool if we start out from a situation where there is no information about the house types. The reason is that the fraction of the favored majority constitutes a minority (i.e., $q_1 = 0.4 < 0.5 = s$). The majority of wooden house owners will block the adoption since instead of paying 2500 they will pay 2667 if the information is adopted.

Let us now assume that there is another but less informative message service available saying that the roof construction is associated with fire risks in that non-straw roofs are less risky than straw roofs. Suppose, that this information can be described by a message service having the following probabilities: $q'_{1\bullet 1} = 3/5$, $q'_{1\bullet 2} = 2/5$, $q'_{2\bullet 1} = 1/2$ and $q'_{2\bullet 2} = 1/2$, where $q'_{1\bullet 1}$ gives the probability that a low risk house has a non-straw roof, $q'_{1\bullet 2}$ gives the probability that a low risk house has a straw roof, and so forth. If we assume the same prior probability for a true low (and high) risk house as before (i.e., $\pi'_1 = 1/3$), the probability for a house to be a low risk that has a non-straw roof is given by $\pi'_{1\bullet 1} = 3/8$. The corresponding probability for a house with straw roof is only $\pi'_{1\bullet 2} = 2/7$. In this case the majority ($q'_1 = 8/15$) will receive the favorable message (that is "non straw roof") and consequently vote in favor of adoption. If the information is adopted the premiums will be $1500 * 3/8 + 3000 * 5/8 = 2437.5$

for the non-straw houses and $1500*2/7+3000*5/7=2571.4$ for straw houses. We can then conclude that although the information about roof construction is less informative concerning fire risks compared to information about building material, the former will be adopted but not the latter. Thus*, the political correctness of information is more critical than its efficiency or informativeness*.

4. General Conclusions and Implications

This paper takes the position that the adoption of information is a complicated process endowed with strategic considerations. New information often suggests organizational actions that will affect various groups' payoffs at the same time as new information can be blocked or severely delayed.

We have analyzed the decision to adopt of information in organizations where the majority decides. In order to do this we applied an already developed framework in which information can be described as a probabilistic message service over a set of types. Two of our main conclusions can be summarized in the following points.

* *Political Correctness*. For information to be adopted it must describe "the world" in such a way that, if actions were taken on the basis of that description, the majority gains. In our model this means that the probability for favorable messages for members of the organization (i.e., q_1) must be sufficiently high. This result should be intuitive as a new alternative interpretation of the median voter theorem in terms of "political" information acquisition.

As a consequence, our results also give a more balanced picture on the efficiency of the majority decision rule under uncertainty. Under different assumptions, the

Condorcet jury theorem states that majority decisions will improve the likelihood that the decision is correct. [19] Our result shows that the majority rule may block the adoption of valuable information under uncertainty. Hence, we demonstrate a new way in which the majority rule may fail to generate efficient decisions.

* *The quality of information*. Informative signals will improve the cost assessments in the economy even if they are imperfect. Efficiency requires that messages that provide better information about costs will be taken into account. With majority decisions the quality of information will not directly matter as long as the prior probabilities for the messages (i.e., q_i :s) and the prior probability for the various types (i.e., π_i :s) are unchanged.

From what has been said many implications ought to suggest themselves. At a general level we provide an alternative theory for weak performance for non- profit organizations that is based on malfunctioning information acquisition. As a consequence, organizations that should be keen on adopting new information should not be subject to majority decisions if those involved will be affected by the information. If this happens our model demonstrates that there is a risk that political correct rather than conclusive information will be generated.

[19] For the Condorcet jury theorem see Ladha (1993) and Berg (1993). The foundations of Condorcet's jury theorem have been criticized by Austen-Smith and Banks (1996). However, Wit (1998) restores Condorcet's result in the presence of mixed strategies.

Appendix 1

Generalization 1: It is easy to generalize Observation 2 by considering the arrival of new information that can be described by a message service μ described over *n* true types and *z* messages. Let us start by indexing the messages according to how favorable they are in terms of their expected costs conditional on the message. Thus, let $m=1$ for the message associated with the lowest expected cost and $m=z$ for the message with the highest expected cost. Let us index the expected costs for the true types by $c_1, c_2, c_3, ..., c_n$.[20] We can then state our next observation:

Observation 2´: *New information will be adopted if it is described by a message service for which there is a message m satisfying both i and ii) below:*

i) $\alpha > c_1\pi_{1\bullet m} + c_2\pi_{2\bullet m} + c_3\pi_{3\bullet m} + ... + c_n\pi_{n\bullet m}$

ii) $q_1 + q_2 + q_3 + ...q_m > s$.

Clearly, those groups of agents associated by message 1, 2, 3,...., *m* will vote in favor since all get cost reductions with the new information according to *i*. Furthermore *ii* conditions that these agents constitute a majority.[21]

Generalization 2: It is also possible to have different status quo premiums for those receiving the same new message and for those receiving different messages. This makes things a little

[20] These terms correspond to *a* and *c* for the low and high cost type in our example.
[21] Note that q_i is a probability but it can be interpreted as proportion of the agents in a model with random selection.

more complicated. In this case a group that gets the same label (or message) by the new message service may consist of one fraction gaining on the information (because of high status quo premiums) and one group that is loosing (because of low status quo premiums).

Suppose the status quo allocation is based on the message service μ' with *y* different messages. We then have *y* different status quo categories with different premiums: $\alpha_1^{'}, \alpha_2^{'}, \alpha_3^{'}, ..., \alpha_y^{'}$ that are assumed be ordered in terms of their value so that $\alpha_i^{'} \leq \alpha_{i+1}^{'}$. Now, denote the cost for the group that receives message *m* in the new message service by $E(C_m) = c_1\pi_{1\bullet m} + c_2\pi_{2\bullet m} + c_3\pi_{3\bullet m} + ... + c_n\pi_{n\bullet m}$. For each group receiving a message *m* in the new message service we can define the *y* subgroups' net benefits from switching to the new information by: $\alpha_1^{'} - E(C_m), \alpha_2^{'} - E(C_m), \alpha_3^{'} - E(C_m), ..., \alpha_y^{'} - E(C_m)$. Now, for each group receiving a message *m* in the new message service define v_m as the fraction of the population whose net benefit is strictly positive (i.e., those subgroups *i* such that: $\alpha_i^{'} - E(C_m) > 0$).[22] As we have included the profitability criterion in the definition of v_m we can simplify the observation as follows:

Observation 2´´: *New information described by* μ *will be adopted if*

$$q_1v_1 + q_2v_2 + q_3v_3 + ... + q_zv_z > s.$$

Thus, our generalizations confirm the earlier conclusion (see Observation 2) that for information to be adopted it is not critical that it is informative, but only that the information is favorable to the majority.

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[22] For instance, $v_3 = 0.45$ means that 45 percent of those receiving message 3 get an increase in their payoff with the new information. .

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