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WHEN MAKING BAD DECISIONS BECOMES HABIT: MODELLING THE DURATION OF MAKING SYSTEMATICALLY BAD DECISIONS

Abstract. *Most part of the models in economics and finance assume that, in general, deciders make good decisions, and bad decisions occur only as exception. This paper analyses some conditions in which bad decisions are made systematically and proposes a model for the estimation of the duration of making systematically bad decisions. Even if individuals are making systematically bad decisions, they can remain in power in many organizations for a long period. Based on Monte Carlo simulations, this paper proves that, in some circumstances, the duration of making systematic bad decisions can be very long.*

Keywords: *decision-making, homogeneous behaviour, rationality, corporate finance, decisional abilities, behavioural finance.*

JEL Classification : G30, L21

1. Introduction

In general, models in economics and finance assume that, at least as trend, agents share the same values. This premise can be based on the peoples' conviction that the others share their beliefs more than they really do (Hirshleifer, 2001). Perhaps, for this reason, it is assumed that it is easy to find the deviations from the normal behaviour, sometimes defined as *rational*. Moreover, if some individuals make systematically bad decisions, they will be 'penalized' by the system; in an evolutionary perspective, these individuals even will disappear. For instance, if one investor on the capital market insists to make bad decision after bad decision, the expected effect is that he or she will lose his or her wealth, because, even if the individuals are not always rational, the markets are, in general, rational (Rubinstein, 2001). As effect, in most of the cases, it is assumed that the agents make good decisions, and only as exception, bad ones.

This paper considers the case in which individuals are following different objectives, based on different values. Based on their personal beliefs, some classes of agents would be convinced that they are making good decisions, even if these decisions may be bad in the opinion of others classes of agents. In some cases, this type of deciders takes the power in an organization (e.g., one shareholder dominates the general shareholders meeting). As effect, he or she can decide for

the destinies of many stakeholders. In this case, if he or she is making systematically bad decisions, the entire organization is affected. Unfortunately, the democratic vote and the good intentions are not enough for guarantying the avoidance of making systematically bad decisions. Moreover, based on the false consensus effect, the deciders will be reluctant to consider the possibility that they make a deviant error (Hirshleifer, 2001). Since they are convinced that their decisions are right, they have no reason to renounce to them, until the results of their actions significantly affect themselves. However, as long as their status is determined also by other factors, too, they can hardly differentiate between the effect of their decisions and the impact of other factors. As effect, they can be convinced that they are making good decisions, and only the external factors (or a conjuncture) create an unsatisfactory result.

This paper analyses the conditions in which making bad decisions can become a systematic phenomenon and proposes a model for the estimation of the *duration of making systematically bad decisions* (hereafter, DMSBD). In other words, this paper proposes a model for estimating the period in which an entity can survive making continuously bad decisions until it changes its wrong policies (or it collapses). Based on Monte Carlo simulations, I show that this period can be in some circumstances very long. One contribution of this paper is to identify the factors that can have an impact on DMSBD and to analyze their influence. Some conditions favour an increase of DMSBD: the percent of individuals that are a part of or are supporting the power, the magnitude of interest for changing the power, the initial stock of resources of the organization. DMSBD also depends on how important for the organization the decisions made by the power.

The analysis of the existence of some agents that are making bad decisions (see, e.g., noise traders) is not a new topic in areas like financial markets and portfolio management (e.g., Thaler, 2000). However, this paper analyzes their impact in the case of an organization, with a focus on corporations. In corporate finance, as the general approach is based on the principle of maximizing the shareholders' wealth, decisions seem to be subordinated to this principle, so the existence of the 'noise decider' is only marginally considered. This paper analyzes the case in which, for different reasons, the deciders make systematically bad decisions.

Considering its implications, this paper can be useful both for academics and for practitioners. Even a short DMSBD is not desirable for the organization. Can the people really understand all? Probably, they do not. As Hirshleifer (2001) states: 'Man is neither infinite in faculties, nor in apprehension like a god'. For this reason, a deeper concern on implications of different decisions is desirable.

The rest of the paper is structured as follows. In Section 2, the literature review and some possible applications are presented. Section 3 provides the model design. In Section 4, I present some numerical results. Section 5 concludes.

2. Literature review and possible applications

Both academics and practitioners are concerned about the causes or/and the effects of making bad decisions or/and the instruments for preventing them. Even if most of the studies suppose that the majority of investors are rational and well informed, making bad decision can happen, of course (at least sometimes it is accepted that everyone can make mistakes), and this is the main reason for studying its causes. Evidently, by definition, the effects are unfavourable. However, in this context, it is assumed that this phenomenon occurs only incidentally. The agents are making, as a rule, good decisions, and only exceptionally, bad ones. De Bondt and Thaler (1995) state (p. 385) clearly this point: "In other areas, what people actually do is, if not the foreground, at least a part of the picture. […] *In contrast, in finance, we simply insist that, whatever the people do, they do it right*. People optimize but otherwise their behavior is like a black box. *The finance literature reveals little interest in investor decision processes or in the quality of judgment*. As a result, it is nearly devoid of people".

One argument usually used in theory is that the forces of the market would correct the behaviour of the agents which are not making the proper decision, also assuming that the majority of the agents are rational, well informed and having a homogeneous behaviour[1]. In the last years, a large amount of literature has challenged these assumed hypotheses. One important challenge is if the agents' behaviour is indeed homogeneous (Thaler, 2000). Most of individuals would agree that people are different, even for some fundamental beliefs not having identical values (see the large amount of literature regarding cultural differences) (Lovric et al., 2008). If this is true, why should we consider that the individuals would have homogeneous expectations regarding the future, or would make the same decisions in a given context?

The possibility that the individuals make different judgments implies that they can be right from their point of view, but bad from the others' one. This phenomenon is largely discussed in the literature related to asset pricing and portfolio management (see the debates related to efficient market hypothesis versus behavioural finance, or traditional finance versus approaches that account for the individual psychology) (Hirshleifer, 2001). Assuming that one class of investors is choosing the right decision and another class – the bad one, the first class will survive on the market, and the second will disappear, relatively soon. Finally, even if some individuals are not rational the markets can be (Rubinstein, 2001).

Comparative with the case of individuals investing on capital market, the situation is changing if the individuals are appointed or voted to rule an organization (e.g., a corporation). What would be the situation if the decider makes

[1] Stiglitz (2010) makes in Chapter 9 a very convincing description of the economic theory status at this moment, but also on the necessity for a reform.

systematically bad decisions? This phenomenon can occur at the level of some organizations and the organization can survive for a long period. As long as the decider is convinced that in most of the cases his or her decisions are right, based on the most veridical assumptions, following the adequate objectives, and taking into account the correct restrictions, only the apparition of a correction from outside would change his or her convictions that the decisions have to be right. How long will be the period until the organization will realize that the decisions taken by the power are systematically bad?

The financial literature developed in time a multitude of normative models, providing solutions to different problems, based on a set of agreed assumptions, and considering the objectives as given (e.g., Markowitz, 1952). However, in practice, in many cases, even agreeing and accepting such objectives is a disputable and sensitive problem. For instance, the objective of a company (and the one of financial management) should be the maximization of the shareholders' wealth (Ross et al., 1999; Copeland et al., 2006) or the company should be interested in harmonizing the stakeholders' interests[2]? The field of corporate governance still debates if the decisions in the firms should be subordinated to the shareholders' theory or to the stakeholders' one (Mallin, 2004). In the same context, one question can be if companies would have to be interested in productive investment projects, or in social responsible investments. It is difficult to state what decision can be considered preferable. It is not obvious which one is right or wrong on long term, but the decisions taken in these two different cases will be different. We can take into account the existence of two classes of agents, each one considering his or her option as right, in opposition with the others' agent decisions. At least in a democratic system, we can agree that the concepts of 'good' and 'evil' are subjective and sometimes different from person to person or, at least, from group of individuals to group of individuals[3]. However, even the best form of democracy should not be a warrant that the decision that the most popular decision is also the best one for the future of the organization.

Each of these groups of individuals will choose the best decision, based on their individual (proper) objectives and restrictions. For this reason, these decisions would be favourable from some agents' perspectives, and bad from some others'. What is the impact on different entities if the objectives are settled in an improper manner? At the moment of the decision, in spite of the large literature regarding forecasting, the final results are not obvious at least for a part of the implied agents.

[2] Copeland, Koller and Murrin (1996) discuss the advantages of the system based on maximization of the shareholders wealth. However, this objective is often challenged, especially by the corporate governance literature, with an accent on social responsibility papers (see, among others, Mallin, 2004).

[3] Among a practical infinite list, some such examples of disputable dichotomous concepts of 'good' and 'evil' can be liberalism versus totalitarian doctrines, science versus belief, liberty versus order, etc. The discussions on this issue transcend the purpose of this paper. For our purpose, it is enough to define two states – "right" and "wrong", even if we cannot state which one is in one category or in the other.

In general, according to the most part of the literature, it is assumed that the decision-maker, after a proper analysis of the current state of information and after performing some sensitivity or scenario analyses (using the best quantitative techniques), will follow the best set of actions in order to achieve an assumed objective. A large notable literature provides best solutions to different objective functions, complying with different restrictions, assuming some axiomatic hypotheses (accepted by the most part of the literature)[4],[5].

Stiglitz (2010) notes that incorrect theories are determining, not surprisingly, inappropriate methods of action, but evidently their partisans believe that their results would be desirable (p. 21). At the moment of choice, even using the best instrument of optimization, there are some questionable issues that are assumed as axiomatic for different reasons. Sometimes, these assumptions are so clear errorless for a distant observer, but completely obvious for the decider, and sometimes for the entire group of stakeholders[6].

An agent can make systematically bad decisions due to many reasons, even in the absence of agency problems, largely discussed in the literature (Jensen and Meckling, 1976). Thus, the fixed objectives can be consonant with the values of the community which adopts the decision, useful for this, but also can be in disagreement with the normal development on long term of this community. This issue is little addressed in the financial literature, based on the assumption that everyone takes into account the consequences of his or her decisions in reaching the objective. Moreover, it can be possible that the decisions to seem reasonable for a part of the population but totally undesirable for the rest. Fixing the bad priorities can be another factor for a bad choice. Another questionable issue is related to the assumed restrictions. These restrictions can be given by some objective, rational reasons, but also by some subjective considerations. These constraints can be in some cases too restrictive, but also in some cases can be too lax. Many proper objectives can be impossible to implement because this lack in forecasting the necessary level of resources (human, financial, environmental or regarding any important kind of resource). The assumed hypotheses can significantly affect the quality of the expected results. People used mental schemes when they make decisions. If people use a wrong model in estimating the effects, this will determine an undesirable result. In a phrase, if the optimization model

[4] Most part of the financial literature is devoted to optimization, respectively the maximization of an indicator (e.g., maximization of shareholders' wealth, expected return, etc.) or the minimization of one (e.g., minimization of costs, risk, etc.) (Markowitz, 1952; Ross et al., 1999; Copeland et al., 2006, etc.). Some models deal with reaching a satisfactory level of wealth (Cyert and March, 1963). For our study, this distinction is not important.

[5] These issues can be easily generalized for other fields (e.g., risk of pollution, in Galupa, Hartulari and Spătaru, 2014).

[6] Soros (2008), born in Hungary in 1930, suggestively remarks: "I learned at an early age how ideologies based on false premises can transform reality. I also learned that there are times when the normal rules do not apply, and the abnormal becomes normal." (p. 11).

solves perfectly a problem, it does not mean it solves three other important problems: (1) Is the objective appropriate? (2) Are the restrictions appropriate? (3) Are the hypotheses appropriate?

The ex post evaluation of different decisions is somehow trivial. It is easy to state if the decisions made by a part of individuals were better than the ones made by another part. History provides many such examples[7]. However, at the moment of decision, the good choice was not clear at all. For instance, most of the aspects of Maya life were rainfall-dependent (Lucero, Gunn, and Scarborough, 2011). In the Mayan civilization, people supposed that one of the prerogatives of the divine kingship, among developing water reservoirs and keeping the water clean, was to provide to the population the necessary amount of rainfalls, through different rituals (Lucero, Gunn, and Scarborough, 2011). In different dry intervals, the Mayan civilization collapsed (see balkanization of polities, increased warfare, socio-political destabilization, political disintegration), followed by the population decline in the context of an extended drought extended for 80 years (Kennett et al., 2012). The response of the kingship to the climate changes was to increase the volume of monumental building programs and ceremonies[8]. It seems that this decision was supported by population, convinced that this is the best solution in order to determine the rainfalls to come. Only in the end, the population of farmers decided to revolt and to renounce to their ruler and to migrate (Lucero et al., 2014). As Lucero, Gunn, and Scarborough (2011) states, "the farmers adapted, kings did not". Retrospectively, it can be noticed that one class of agents continued to apply a set of decisions even if they were contrary to their interest - "Maya kings used the same rituals that had served them in the past in the hope that conditions would change; they did not" (Lucero, Gunn, and Scarborough, 2011). Even if it seems that the farmers finally have survived, the Mayan civilization collapsed.

In this paper, we analyse what are the effects if the decider makes decisions (which evidently affect real life) based on wrong objective functions, wrong restrictions or wrong hypotheses. Even the financial theory (and economics, in general) is in a large extent an amalgam of facts, elegant demonstrations, but also is subordinated to some fashionable values, which has changed during the years. Some recent developments of the financial theory are sometimes so deeply anchored in disputable axioms, but are no longer interested in analyzing if the results can evidently contradict the reality. Some challengers of the main flow of knowledge in finance simply cannot be contradicted based on the traditional financial axioms (see, for instance, behavioural versus traditional finance).

[7] However, to a certain extent, this valuation can be affected by survivorship bias. The history is written by the winner, who will interpret or, moreover, will change the recorded facts for propagandistic or another (potential infinite as number) reasons.

[8] Lucero, Gunn, and Scarborough (2011) mention: "Increasing evidence suggests that kings at some centers intensified monumental building programs and ceremonies, likely indicating their attempts to appease the rain god Chaak, the Maize god, ancestors, and others—an ancient Maya stimulus package, if you will. *Could this labor have been better expended elsewhere?*".

In each organization in which the decisions are taken democratically, the phenomenon of making systematically bad decisions can occur (for instance, at a macro-social level, the choices during political elections, or at the companies' level, the decisions taken in the Shareholders General Meetings). This diversity of opinions can have as effect a difficulty to understand the magnitude of consequences of the power's decisions. In this context, a long period of time can occur before the agents to understand that the power is making systematically bad decisions. Next section provides a model for estimating this duration.

3. Model design

I consider the case of one institution, which can be a corporation, but also, in a more general case, any group of persons, in which the decisions are taken democratically (even the population of one state, implied in the elective process) (See Section 2). In this organization, the decisions are taken based on direct vote, each voter being free to vote for the decision which he or she considers to be correct. The votes are equal and also the power in negotiation is equal between classes of individuals[9]. The decisions are taken if a simple majority is reached (more than 50% votes[10]). All the agents are interested in their calculations on the organization's wealth and evaluate it similarly. No agency problems are taken into account (agents are interested only by the results of the organization and do not take into account their personal objectives in making the decisions) and the information is symmetric. All the agents' utility is directly influenced by the organization's wealth (W) ($\frac{\partial U}{\partial W} > 0$).[11] I supposed that the agents cannot leave the organization.

The classes of agents that are acting in making decisions in the organization are defined in Section 3.1. Their behaviour is described in Section 3.2. I considered that their behaviour is determined by the relation between the level of the effective wealth of the entity and the agents' level of aspirations (see Section 3.3). Finally, in Section 3.4, I make a synthesis of the factors that have an influence on DMSBD until the switch in power occurs.

[9] I have considered that all the agents have equal power and are active in making the decisions. The model can be easily generalized for the case in which some individuals have a greater power in making the decisions (see, for instance, the case of dual classes of shares in corporations; for details, see, for instance, Nenova, 2003). In this case, the percents of voters would be replaced by percents in voting power. Also, the model can be applied in the case in which individuals choose to renounce to their right to vote, in this case their vote being distributed among the other agents.

[10] This hypothesis can be easily adapted for cases in which a supermajority is required (see, for instance, Ross, Westerfield and Jaffe, 1999, p. 779) (see Section 3.1).

[11] Of course, the agents can be interested not only by wealth, but also by other conditions, which can contribute to their utility function (peace, natural conditions, etc.). The model allows for this generalization, so in a more general model, wealth can be interpreted as a total amount of factors that are determining the utility function for the community (see, for instance, Ballestero et al., 2012).

3.1. Classes of agents

I assume that in the organization are acting n=4 classes of agents, with x_t^k the percent of individuals from the class *k* in total population at the moment *t*, with $\sum_{k=1}^{n} x_t^k = 1$. We define these 4 classes of agents as such: (i) Class A – the decider (the power), making systematically bad decisions, until the power is switched; (ii) Class B – the opposition, understanding that the decisions of the Class A are bad; (iii) Class C – the individuals that can change their decision, switching from supporters of the power to supporters of the opposition; (iv) Class D, residual in this model, considered initially to support the power. In general, we can agree that these are the common classes of deciders in common organizations.

Class A of individuals has the power to take the decisions and they will keep it until the percent of opponents become higher than 50%. They are convinced that they are making the right decision even if this is bad, so they would not change it until the majority decides a switch in power. They are not influenced by the arguments given by the agents from other classes. This class of agents is well documented in the financial literature (Akerlof and Dickens, 1982; Thaler, 1999; Hirshleifer, 2001, etc.). In these studies it is assumed that they can have an influence on different variables; in our model they are the deciders in the company.

Not all the decisions taken by the power should be necessary bad. However, the decider is overconfident in her or his decisions (Hirshleifer, 2001). Each decision taken by Class A can be structured in two components (see, also, Section 3.3): (i) a part of the decision, with negative impact on the level of wealth (let it be F_A, a random variable, $F_A < 0$ in the model); (ii) another part of this decision, with an unpredictable impact on wealth, which can be assimilated to the decisions taken by other stakeholders and/or the other factors which can affect the wealth (F_t, a random variable). Evidently, in the case in which the most part of their decisions are bad, their negative impact would be more important.

Being the power, always, Class A will vote for status quo, respectively to maintain the actual position. Their attitude can be considered realistic: Samuelson and Zeckhauser (1988) provide evidence that deciders prefer status quo among a list of alternatives. For simplicity, we will assume that x_t^A is constant in time. From here, if $x_t^A > 0.5$, and the decisions taken by the power are very important, the bad decisions will be taken until the entity no longer exists, being only a matter of time until the initial stock of wealth is entirely consumed. However, the situation does not degrade in a short period of time; it depends also by many other factors (see Section 4, case 1). One important factor, which can determine an increase of DMSBD, is the initial level of wealth: an organization in which the level of wealth is significant can support better a series of bad decisions. More interesting is the situation in which we consider that $x_t^A < 0.5$, presented below. The case in which $x_t^A = 0.5$ determines a game in which no decision has the majority and the resolution is depending by the manner this situation is solved by the system.

Class B of individuals is rational in the sense of classical hypotheses of economic theory. They have the ability to identify the *true* right decisions, so they are not influenced by the arguments of the other classes. In the mainstream of

financial literature, they can be considered advantaged by their superior ability to understand the market and they can reach systematic abnormal earnings (see, for instance, Ross, 1976). However, in this case, they do not make the decisions in the organization. They will be in opposition to the decisions of the power (class A), so they will vote always against the power. For simplicity, we will also assume that x_t^B is constant in time: x_t^B = constant. Of course, by hypothesis, x_t^B has to be lower than 0.5: $x_t^B < 0.5$.

The key element in this model is **Class C** of agents. They can change their decision if they are disappointed by the level of wealth, even if initially they do not understand that the power is making bad decisions. They are not influenced by the arguments provided by classes A and B, but by the level of wealth (see Section 3.2). This class of agents is represented by the total percent of agents which are changing their opinion comparative to the initial situation, when they support the power. Initially, $x_0^C = 0$.

Class D contains the rest of the agents, their percentage at one moment t, x_t^D, supporting the power, characterized by a status quo bias (Samuelson and Zeckhauser, 1988):

$$x_t^D = 1 - x_t^A - x_t^B - x_t^C.$$

3.2. Agents' behaviour

Based on the definitions provided below, the switch in power is determined exclusively by the changes in the voting preferences of Class C. We suppose that the agents from Class C form their opinions considering both the effective level of wealth (W_t) and the desirable (target, aspiration) one (W_t^*). They can have two attitudes (votes): (i) if $W_t \geq W_t^*$, then Class C individuals are satisfied and they keep their voting preference; (ii) if $W_t < W_t^*$, then they change their voting preferences. Based on these assumptions, Class A remains in power until: $x_t^B + x_t^C > 0.5$.

As long as the percents of individuals in Classes A and B are considered constant, and the percent of individuals in Class D is residual, the change in power depends only by the attitudes of Class C. Many rules of evolution can be proposed for percent of the Class C agents. Simulations can take into account that individuals from Class C can change their voting preferences permanently ($x_t^C \geq x_{t-1}^C$, $\forall t$) or that they can switch their preferences depending on the level of wealth, respectively: (i) if $W_t \geq W_t^*$, $x_t^C \leq x_{t-1}^C$; (ii) if $W_t < W_t^*$, $x_t^C \geq x_{t-1}^C$. This last situation will determine even a greater delay in the switching of power.

It seems to be logical that the disappointment of one class of agents can determine a switch in the voting decision. However, it is not obvious which the speed for changing the voting preferences is. Samuelson and Zeckhauser (1988) prove that the agents prefer in many situations the status quo (the "anchoring" effect). For instance, we can consider a law of evolution of x_t^C to be given by:

$x_t^C = x_{t-1}^C + \alpha_t \cdot M_t \cdot x_{t-1}^D = x_{t-1}^C + \alpha_t \cdot M_t (1-x^A-x^B-x_{t-1}^C) = x_{t-1}^C (1-\alpha_t \cdot M_t) + (1-x^A-x^B)\alpha_t \cdot M_t$

Thus, the percent of class C agents at each moment x_t^C is depending by the previous status of this percent (x_{t-1}^C), but also by a possible increase based on changing preferences of the class D agents (x_{t-1}^D) by period to period. The agents from class D are changing their point of view and vote for a switch in power (becoming agents from class C) if and only if they do not reach a satisfactory level for wealth W_t, respectively $W_t < W_t^*$. As such, $\alpha_t = \begin{cases} 1, \text{if } W_t < W_t^* \\ 0, \text{if } W_t \geq W_t^* \end{cases}$.

M_t is a random variable uniformly distributed on [0,1], which can be interpreted as a magnitude of the interest to change the power. If $M_t = 0$, this can be interpreted as a total indifference to the level of wealth, but also as a conservative attitude (a high level for conservatism, see Hirshleifer, 2001). If $M_t = 1$, the entire population of agents from class D will change their voting preference, joining the class C of agents, immediately after the level of effective wealth is below the desired one. M_t is dependent of different factors that can have an impact on wealth and for this reason is not constant in time (see section 3.3.). It is not the purpose of this study to deepen the analysis of this factor. However, some statistics regarding the switches in the political regime can give some clues regarding this issue.

3.3. Effective wealth and desired wealth

The agents are comparing the current level of wealth with the level of their aspirations. The level of wealth at one moment W_t is depending on the level of wealth at the previous moment W_{t-1} (we considered that W_0 is fixed, being the level of wealth at the moment when class A take the power in the organization), but also is influenced by the decisions made by different agents and also by other different external factors (for instance, natural factors) or restrictions (for instance, in capital budgeting, the available budget; in investments, the available opportunities, etc.). I structured these factors in two categories, respectively the factors determined (unfavourably) by the decisions taken by Class A ($F_{A,t}$), and the factors unaffected by these decisions (F_t). The discussion regarding which are these factors can be very ample, and it transcends the purpose of this article. However, this segmentation of decision seems to be plausible. It can be considered that not all agents understand ex ante the impact of different decisions. Thus, the agents are not always able to identify the impact of different factors, but understand the effects ex post. A negative level for F_i can be interpreted as having a negative impact on wealth, and a positive level F_i as a positive impact on wealth. The level of wealth can be written as:

$$W_t = W_{t-1} \cdot (1 + R_t),$$

where R_t is the percentage change (similar to the return of an asset). We can consider that the return is determined by a model, similar to APT (Ross, 1976) or

multi-factor model (Fama and French, forthcoming)[12]. As such, the return at the moment t can be written as:

$R_t = \sum_{i=1}^{n} \beta_{it} F_{it} + \sum_{j=1}^{m} \beta_{jt} F_{jA,t}$, so the wealth can be written as:

$W_t = W_{t-1} \cdot \left(1 + \sum_{i=1}^{n} \beta_{it} F_{it} + \sum_{j=1}^{m} \beta_{jt} F_{jA,t}\right)$.

From here, we can define the evolution of wealth as being determined by two components, respectively:

$$W_t = W_{t-1} \cdot \left(1 + \beta_{1t} F_t + \beta_{2t} F_{A,t}\right).$$

Both β_{1t} and β_{2t} are positive sensitivity coefficients. Higher are these coefficients, higher is the impact on the level of wealth (a zero level can be interpreted as no impact). β_{1t} can be defined as a sensitivity of the entity's wealth in absence of the bad decision. In the same manner, β_{2t} can be considered as a sensitivity of the entity's wealth to the bad decision taken by Class A. As long as the factors taken into account are not even always known by the agents and they can be different from period to period, it seems plausible to assume that these sensitivity factors as being variable in time. In most cases, $\beta_{1t} > \beta_{2t}$, but this is not always true.

$F_{A,t}$ is also a random variable, $F_{At} \epsilon \left[F_{A,t}^{min}, 0\right]$, with $F_{A,t}^{min} < 0$. Notice that F_{At} is, by definition, at most 0, so it includes at most case neutral decisions. For our analysis, we can consider that the bad decisions are included in $F_{A,t-1}$ and the other decisions (the good ones) in F_t.

F_t is a random variable, $F_t \epsilon \left[F_t^{min}, F_t^{max}\right]$. I assumed that $F_t^{min} < 0$ and $F_t^{max} > 0$. In F_t can be included also the decisions made by the power, but with a positive impact on wealth. All these factors can have a cumulative impact which can be positive, negative or neutral. Some of these factors are depending by the behaviour of the agents, but we can consider also here other external factors, which cannot be influenced by the agents (natural factors, for instance).

In this model, the agents in Class C are comparing the current effective level of wealth with a desired one. I have modelled this desired level for wealth based on three cases. (i) First, I have considered a fixed level of wealth ($W_t^* = W_0^*$). (ii) However, the level of aspirations is subject to changes, too. I have assumed that the desired wealth W_t^* is depending by two variables regarding the past wealth: the past desires and the past achievements. From this point of view, W_t^* should be the maximum between the level of desired wealth in the last year and the achieved level of wealth in the last year: $W_t^* = \max (W_{t-1}^*, W_{t-1})$. From this point of view, I have considered that agents adapt their expectations and do not agree to renounce to the past achievements obtained in negotiation (similar to, for instance, Cyert and March, 1963; also, Greenwood and Shleifer, 2014, show that agents are making their expectations mainly based on the past records and not on different models

[12] It can be argued that the impact of different categories of factors is not immediate, but also with lags (e.g., Engle, 1982). I have considered that the variable F_{it} includes also the lagged determinants which have an impact at moment t ($F_{i,t-j}$), where j is the lag.

like CAPM). One very similar case is the one in which the level of aspirations increases from period to period. This case is concordant with the main part of the literature in investments and corporate finance, which assumes that the investors are requiring a positive real rate of return. (iii) In the third case, I assumed that the level of aspirations can be subject to deception, too. For this reason, I have modelled the level of desired wealth as:

$$W_t^* = max(W_{t-1}, W_{t-1}^* \cdot (1 - \gamma))$$

In this equation, γ is a random variable, with $\gamma \in [0,1]$. If γ =1, that is meaning that the agents have no aspirations anymore. In this case, it can be considered that the agents are founding their expectations based in principal on past achievements, maybe corrected to the past desires. If γ =0, that is meaning that agents maintain their aspirations at the level acquired in the last period and the case (iii) becomes the case (ii).

3.4. The change in power

Based on the general considerations described below, the period in which the switch in power occurs depends by the factors described in Table 1.

Table 1: Factors that have an influence on the duration of making systematically bad decisions (DMSBD)

Factor	Symbol	Dependence
Percent of individuals that are part of the power	x^A	Direct
Percent of individuals that are against the power	x^B	Indirect
Percent of individuals that are supporting the power	x^D	Direct
The magnitude of interest for changing the power	M_t	Direct
The initial stock of wealth	W_0	Direct
The level of the desired wealth	W_t*	Indirect
The importance of the decisions made by the power on the level of wealth	β_2	Indirect

Some numerical results are presented in Section 4.

4. Results

For a sensitivity analysis regarding the impact on DMSBD of the factors presented in Table 1, I performed Monte Carlo simulations in Excel for Windows, used frequently in financial management (see, for instance, Dragotă and Dragotă, 2009). The simulations are based on the considerations presented in Table 2. These numerical cases are only exemplificative.

First, I analyzed the case in which the dominance of Class A persists, indifferently by the impact of its decision ($x_t^A > 0.5$, Case 1). Secondly, I analyzed some cases in which $x_t^A < 0.5$.

Case 1: Dominance of Class A agents ($x_t^A > 0.5$)

In this case, Class A will stay in power, even if the wealth will decrease continuously. Finally, Class A will lose the power de facto because they will rule for nothing, because the wealth will decrease to 0. It can be noticed that, in this case, Class A of agents remains in power indifferently if the effective wealth is higher or lower than the desired level of wealth. Of course, as long as Class A can remain in power indifferently which the wealth resulted as effect of their decision

is, DMSBD will be higher comparative to the case in which a switch in vote can occur. However, the evolution of wealth depends on the importance of the decisions taken by the power. As observation, it can be noticed that the level of effective wealth can increase even if the deciders are making bad decisions because the existence of other factors, which are not affected significantly by these decisions.

Table 2: Example of simulation for the duration of making systematically bad decisions (DMSBD)

Column (1)	**Column (2)**	**Column (3)**	**Column (4)**	**Column (5)**
Iteration	x^A	x^B	x^C	x^D
0	24.00%	1.00%	0.00%	75.00%
1	24.00%	1.00%	2.25%	72.75%
2	24.00%	1.00%	2.25%	72.75%
3				
...	...	...	...	...
Column (6)	**Column (7)**	**Column (8)**	**Column (9)**	**Column (10)**
Vote against the power	**CHANGE / STATUS QUO**	M_t	α_t	W_t
1.00%	STATUS QUO	...	...	100
3.25%	STATUS QUO	0.03	1	99.89
3.25%	STATUS QUO	0.02	0	100.23
(3) + (4)	If Column (6)>0.5,"CHANGE", otherwise "STATUS QUO"	Random variable in (0,0.1)		
...	...	...	...	...
Column (11)	**Column (12)**	**Column (13)**	**Column (14)**	**Column (15)**
W_t^*	β_1	β_2	F_t	F_t^{min}
100.00	...	...	...	...
100.00	0.89%	0.17%	-0.12	-46
100.00	0.94%	0.06%	0.39	-5
	Random variable in (0.08,0.1)	Random variable in (0, 0.02)	0.01· random variable between columns (15) and (16)	Random variable in (-50, 0)
...	...	...	...	...
Column (16)	**Column (17)**	**Column (18)**	**Column (19)**	**Column (20)**
F_t^{max}	$F_{A,t}$	γ	**Min (W_t , W_t^*)**	**Max (W_t , W_t^*)**
...	...	...	100.00	100.00
50	-0.03	0.0000	99.89	100.00
54	-0.38	0.0000	100.00	100.23
Random variable in (50, 100)	Random variable in (-1,0)	Random variable in [-1,0]		
...	...	...	...	...

In this table, the third row explains the law of evolution for the variables not defined in the text. The numerical values are only exemplificative. For the notations, see the text of the article.

According to the simulations (depending on the numerical inputs in the model), the duration of the period of making systematically bad decisions can be

very long (for instance, thousands of iterations). The explanation of this phenomenon resides in the influence of other causes for the level of the effective wealth, independent of the agents in power. For instance, at the macroeconomic level, even if the major decider can decide non-optimally, a great part of the population can compensate the effects of these decisions by taking optimal decision at a microeconomic level. Also, even if a government imposes an absurd fiscal system that does not mean the economy will instantly collapse. Of course, for the organization, it is preferable that the incompetent leader to make few decisions.

Case 2: Democratic vote

I made some simulations for emphasizing the impact of different variables – the level of aspirations, the conservatism versus revolutionist, the importance of the decisions made by the power, and also the percent of rational agents – on DMSBD.

2.1. Level of aspirations

If Class C does not change the level of aspirations, the change in power occurs relatively quickly because of the badly chosen decisions made by the power (see figure 1, centre). Even more, if the agents are increasing their level of aspirations, the switch in power can occur sooner (see figure 1, left). However, if Class C decreases the level of aspirations, a disappointed attitude (people become convinced that the obtainable wealth is subject to decrease, too), the change in power can occur very late (see figure 1, right).

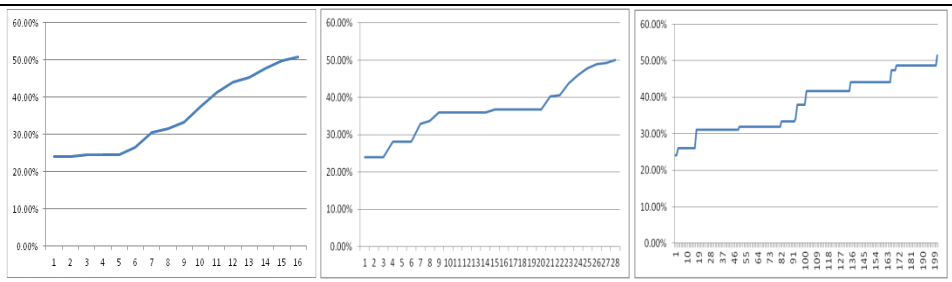

Figure 1: The evolution in time (iterations) (x-axis) of the percent of voters which are voting against the power (y-axis) until they take the power considering different levels of aspirations regarding the wealth. Left: the level of aspirations regarding the wealth is increasing. Centre: stable level for aspirations. Right: the voters are decreasing their level of aspirations.

2.2. Conservatism versus revolutionist

A higher level for conservatism (a high level for M) determines an increase for DMSBD. Assuming $\gamma = 0$, in Figure 2 are presented the percent of voters for one case in which the level of conservatism is low (high M) and vice versa (low M).

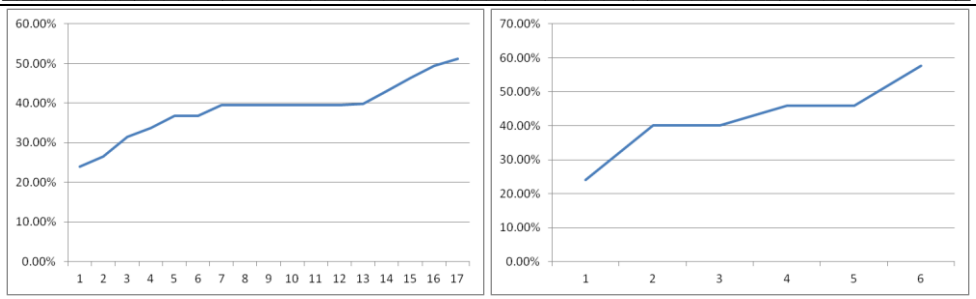

Figure 2: The evolution in time (iterations) (x-axis) of the percent of voters which are voting against the power (y-axis) until they take the power considering different levels of conservatism. Left: a higher level of conservatism (M ∈[0, 0.1]). Right: a lower level of conservatism (M ∈[0, 0.5])

2.3. The importance of the decisions made by the power

If the decisions made by the power, making systematically bad decisions, are important for the level of the wealth, DMSBD will be lowered (see Figure 3).

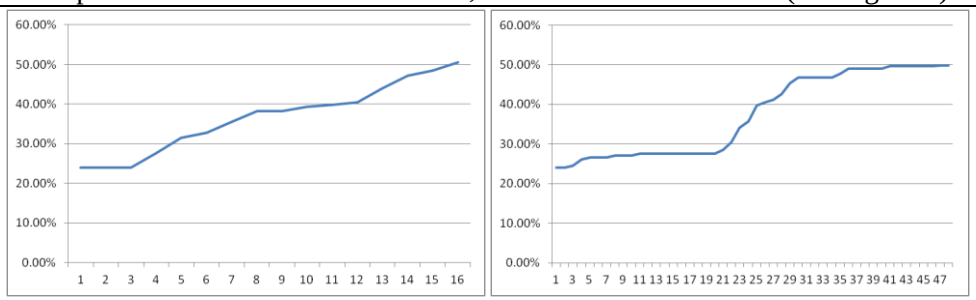

Figure 3: The evolution in time (iterations) (x-axis) of the percent of voters which are voting against the power (y-axis) until they take the power considering different levels of importance of the decisions made by the power. Left: high impact of the decisions made by the power for the organization on wealth. Right: low impact on wealth. It can be noticed the different duration of making systematically bad decisions.

2.4. The percent of rational agents

Finally, the duration of the period in which the decider makes systematically bad decisions is depending by the number of agents that can be aware by this situation (x_t^B). In figure 4 are presented two cases for the initial situation: one in which no agent rationalizes the situation (x_0^B=0%), and the one in which this number is significant.

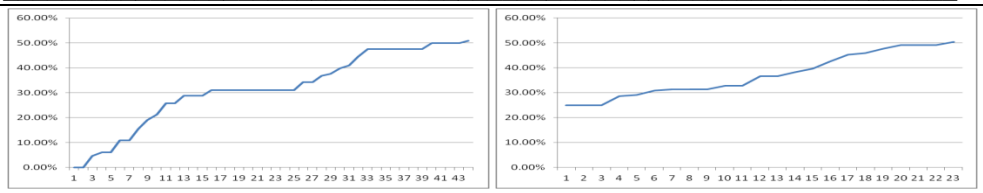

Figure 4: The evolution in time (iterations) (x-axis) of the percent of voters which are voting against the power (y-axis) until they take the power considering different percents of agents that understand that the power is making systematically bad decisions. Left: initially, no agent understands that the power is making systematically bad decisions (x_0^B=0%). Right: 25% of agents understand that the power is making systematically bad decisions (x_0^B=25%).

5. Conclusions

This study provides a pessimistic perspective on the duration in which the deciders in an organization can make systematically bad decisions. In some circumstances, this duration can be very long. One new direction for the study is to calibrate the model for different real (numerical) situations in economics and finance.

It is not mandatory at all that a group of individuals to renounce to their power or to their decisions only because they are making systematically bad decisions. They can remain in power a long period of time. Moreover, the deciders may not understand that they are making bad decisions. The length of this period is positively related by the good performance of the people (and activities) less influenced by the power's decision, but this performance can be interpreted by the power as a result of their good decisions! If this situation can be explainable in dictatorship, it is less acceptable if the decisions are made democratically. However, the democratic vote is not enough *per se*. In the absence of a real interaction between classes of agents the deciders can persist in making bad decisions and the length of DMSBD can be very long. One solution is to take into account the viewpoints of the other classes of agents.

This paper does not study the impact of agency problems or asymmetrical information. One new direction for the study is to consider that the class of agents that makes decisions includes in their utility function some private benefits, too, inducing some false inputs and creating asymmetrical information. However, these dysfunctions of the organization have as effect an increase of DMSBD, so the general image would be even more pessimistic.

This paper is concerned about financial decisions at a company level. In other words, it is a corporate finance paper. However, most of the conclusions can be easily extrapolated to other entities, with applications in different other fields, at a macroeconomic or political level, but also for other fields, as human resources management. For instance, different experts in human resources management have decided in time a set of criteria for the valuation of different categories of employees. Spence (1974) provides a proof of a pessimistic result regarding the disastrous impact of using an inappropriate signal on the labour market (the racial discrimination), but also of the decision of the State to replace one kind of

discrimination with another. At a macroeconomic and/or a macro-social level, adopting a government system (see totalitarian – religious, based on communist doctrine, etc., versus democratic systems) implies a development of the society in a direction which can be right or wrong, depending by the individuals' points of view. At the macroeconomic level, we can discuss about the opportunity of a set of policies focused on encouraging the private property versus policies oriented on social protection, individualism versus collectivism, the best type of energy produced, etc. The list can be easily expanded, providing some new directions for the study.

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