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PRO-SOCIAL MOTIVATION AND  
CROWDING-OUT EFFECT

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## ABSTRACT

Lo scopo di questa tesi è quello di provare ad analizzare un argomento straordinariamente ampio e complesso come quello delle motivazioni intrinseche. Di rilevante interesse sono i contesti nel quale quest'ultime si manifestano e le condizioni che portano ad un loro incremento o affievolimento. E' affascinante provare a capire cosa spinge un individuo ad eseguire un'azione o meno, preferire una attività ad un'altra e come interventi estrinseci, ad esempio i pagamenti pecuniari, influenzano il comportamento umano. Questo tipo di ragionamento non si basa soltanto su un pensiero di tipo economico, ma fa anche riferimento alla psicologia sociale al fine di affrontare un argomento estremamente complicato come il comportamento umano. Più precisamente il focus è diretto alle motivazioni pro-sociali, una specifica tipologia di motivazioni che sono destinate al beneficio di altre persone. La scelta di analizzare questo tipo di motivazioni, che riguardano il benessere altrui, è dovuta al periodo storico che stiamo attraversando. L'emergenza Covid-19 dovrebbe averci insegnato quanto tener conto della sicurezza delle altre persone significa prendersi cura anche del proprio benessere. L'importanza di collaborare e stare uniti a livello sociale con altre persone per raggiungere obiettivi più grandi quale il cambiamento climatico o porre fine alle discriminazioni razziali di qualsiasi tipo, sono tematiche strettamente attuali. Particolare attenzione è rivolta alla cosiddetta motivational crowding-out theory e

sul suo funzionamento, contrapposto al più convenzionale price effect implicito nell'economia neoclassica. Il crowding-out effect, a differenza del price effect, implica una riduzione nell'impegno o nello svolgimento di una attività da parte di un individuo dovuta all'inserimento di interventi estrinseci. Ulteriore interesse è rivolto all'environmental morale. L'environmental morale rappresenta il perfetto esempio di motivazione pro-sociale con numerosi esempi empirici riguardanti il motivational crowding-out in contesti riguardanti decisioni di tipo ambientale.

Il primo capitolo inizia esaminando come l'economia comportamentale, che nasce come critica all'economia neoclassica, affronta i concetti di razionalità e delle emozioni. Essa tenta di riconciliare le visioni opposte di economia e psicologia sulle motivazioni intrinseche. Durante il capitolo sono analizzati i concetti di locus of control, autodeterminazione e autostima che sono correlati alle motivazioni intrinseche insieme ad una analisi analitica di queste ultime. Il primo capitolo si conclude con un breve riferimento alle motivazioni estrinseche e come esse possono essere internalizzate dagli individui.

Nel secondo capitolo sono analizzate nello specifico le motivazioni pro-sociali e i suoi costituenti, le preferenze sociali e il warm glow, due categorie di motivazioni intrinseche. Nel capitolo sono presenti riferimenti empirici volti a dimostrare la presenza e il funzionamento sia delle preferenze sociali che del warm-glow.

Il terzo capitolo analizza la motivational crowding-out theory. Essa implica l'affievolimento delle motivazioni intrinseche e pro-sociali quando un intervento esterno, monetario o meno, viene introdotto in una specifica relazione. Durante il capitolo viene comparato il crowding-out effect con il più convenzionale price effect. Quest'ultimo al contrario del crowding-out effect implica un aumento dell'impegno profuso da un individuo durante lo svolgimento di una attività quando vengono introdotti incentivi monetari. Il crowding-out effect è analizzato inoltre facendo riferimento al valore di scambio che si crea quando si ha la possibilità di venire pagati per un'attività prima gratuita e al salario relativo guadagnato da diversi individui.

Il quarto e ultimo capitolo analizza il problema dell'environmental morale. Essa rappresenta un aggregato di norme internalizzate e motivazioni intrinseche le quali possono essere soggette a crowding-out dovuto ad un intervento esterno. Nel capitolo viene analizzato un esperimento effettuato da Goeschl e Perino nel 2009 il quale analizza come diversi tipi di interventi, tasse o standard di emissioni, influenzano il comportamento di alcuni individui che devono affrontare decisioni riguardo l'ambiente.

## INTRODUCTION

This thesis try to analyse an extraordinary difficult and ample argument that are intrinsic motivations, the contexts in which them occur and the conditions that enhance or diminish them. The attempt to understand what push people to perform an action or not, prefer a task rather than another, the impact of extrinsic rewards such as pecuniary payments, to individuals' attitude is fascinating. This kind of reasoning do not involve just an economical thinking but also some references to psychology in order to deal with an extreme intricate argument like human behavior. Trying to figure out where motivations are collocated in the economic literature and how their investigation is different to the one done by the psychological literature is a major concern of the dissertation. More precisely, the focus is directed to pro-social motivations, a specific kind of intrinsic motivation that are intended to benefit other individuals. The choice of analyse this kind of motivation that regard minding about other is driven by the historical period we are going through. Covid-19 emergency should have taught us how taking care about other people safety, means also taking care about our well-being. The importance of collaborating and stick together with other people to reach a bigger scope like the environmental change or to put an end to racial discriminations is a highly topical issue. Particular attention is addressed to the so-called, motivational crowding-out theory and its functioning, contraposed to the more conventional

price effect implicit by classical economics backgrounds. The crowding-out effect, conversely to the price effect, imply a reduction in effort or in the performance of a task due to the introduction of extrinsic interventions. Further interest is devoted to environmental morale; it goes without saying how this topic is significant and actual nowadays. Environmental morale, in fact, represents the perfect example of pro-social motivation with lot of empirical evidences about motivational crowding-out in contexts involving environmental decisions.

The first chapter starts examining how Behavioral economics, a critique to neoclassical economics, address the concepts of rationality and emotions aiming at reconcile the economical and psychological opposite views of intrinsic motivation. Intrinsic motivation are then investigated along with the related concepts of locus of control, self-esteem, self-determination and a general framework of a model concerning intrinsic motivation. The first chapter ends with a brief mention to extrinsic motivation and how them can be integrated and internalized by individuals.

In the second chapter are studied specifically pro-social motivations and behaviors, a particular category of motivation that merge two categories of intrinsic motivation. The pro-social behavior constituent: social preferences and warm glow, are investigated as well as some experimental evidences of its presence and functioning.

The third chapter analyse the motivational crowding-out theory: a specific effect that influence intrinsic and pro-social motivation, undermining them when monetary and non-monetary external rewards are introduced. During the chapter is provided a comparison between crowding-out and price effect that influence as well individuals' behavior. The latter, on the contrary to the crowding-out theory, imply an enhancement of effort due to the introduction of pecuniary incentives. The crowding-out effect is also examined in reference to actions or behaviors exchange value and to relative income earned by agents.

The fourth and last chapter address the issue of the environmental morale. It represents an aggregate of internalized norms and intrinsic motivation, which may be crowded-out by an external intervention. Furthermore, in the chapter, is analysed an experiment done by Goeschl and Perino in 2009 which analyse how different kind of external intervention, taxes and emissions standard, affect individuals' behavior when facing choices concerning the environment.

## **CHAPTER 1**

### **INTRINSIC MOTIVATIONS: A BRIEF ANALYSIS**

#### **1.1 ECONOMICS, RATIONALITY AND EMOTIONS**

Before delving into the analysis of intrinsic motivations, it is necessary to make a step back trying to understand the environment in which firms, workers and consumers operate in. This environment is complex, because people are driven by emotions and are influenced by the environment of which they are part. Carlos Obregón in his book “Beyond Behavioral economics: who is the economic man”(2018), try to answer the question of which branch of economics is capable of better explaining the behavior and motivation of an individual, that in an uncertain world, under some circumstances may act in an irrational way.

##### 1.1.1 Behavioral Economics

Obregón affirms that, Behavioral Economics was built mainly as a critique of the strong rational economic man, econ, of contemporary Neoclassical Economics. Behavioral Economics integrates psychology and economics arguing that we are humans and not econs. Humans are not rational, they are emotional beings who under some circumstances may take the wrong choices. Humans are not selfish individuals; they are altruistic and cooperative. Behavioral Economics is based on the assumption that emotions and group influences, count in the individual

perception of reality. People get well-being by compensations different from money such as socio-economic and psychological incentives. Economics decisions, therefore, are related to human relationship and social interactions.

The scientific method used in psychology is very different from the one used in economics. Psychologists base their results on empirical findings, while economists study reality from an abstract deductive mathematical model. The object under study is also different; psychologists are concerned with broad human individual and social behavior. Economists instead, are interested in market prices, consumer and producer microeconomic behavior or financial and macroeconomic stability. Economics only concern with individual or social behavior is to the extent of solving the set of economic problems mentioned earlier. Behavioral Economics can be defined as the quest to integrate psychology and economics showing that the definition of humans in psychology can provide light into specific economic problems. Obregón clarify that Behavioral Economics is not and will not be a new paradigm in economics, simply because it cannot solve the full set of problems that economics need to address.

Obregón identifies five reasons that lead to the success of Behavioral Economics:

1. Any organization is a social micro-cosmos, where three systems exists: an Economic, a Power and an Integrative System. Neoclassical Economic theory based only on the Economic System was insufficient.

2. There was advances in cognitive-behavioral psychology and social psychology which had shown the relevance of emotions and group influence in the individual decision making process. The question was “What’s happen in economics if we replace the abstraction of the rational economic man with humans with emotions belonging to a social group?”
3. Economics and business departments become more integrated in many universities. The business community became more influential in economic thinking.
4. The success of the game theory provided a specific tool to test the hypothesis of Behavioral Economics.
5. The 2008 crisis discredited the contemporary Monetarist-Ration Expectations Neoclassical School, the predominant at that time, which argued that market always stabilize by themselves.

Kahneman, which is considered with Smith and Tversky one of the fathers of Behavioral Economics, in his book “Thinking Fast and Slow” (2011) gives a representation of the psychological roots in Behavioral Economics. He differentiate between two psychological systems in human beings. System 1 is related to automatic operation, while system 2 construct thoughts in an orderly series of steps. Kahneman shows that the notion of rational man, with consistent preferences through time, can’t be sustained given the psychological knowledge of human beings. System 1 is owed to humans’ evolutionary heritage. It exists because is

helpful in a quickly changing environment in which survival requires rapid responses to threat signals. When the world is uncertain, people make inferences from a small amount of information available around them and not on statistical consideration. People respond emotionally, follow the herd because survival requires belonging to the group. The main function of system 1 is to maintain a model of everyone's personal world, which represent what is normal in it. System 1 has certain traits and preferences, which embodies reality by association of complex patterns of links. When emotions are high, system 1 may prevail more often and this is the reason why decision-making could be not rational. System 2 has to overcome the intuitions and impulses of system 1 and therefore requires self-control.

According to Kahneman, people are evolutionarily prepared to give heuristic, quick, answers that often are imperfect. One of this heuristic response is herding. As already mentioned before, social behavior of others, influence individual behavior. Consumers, when provided information, adjust their consumption to the social reference of friends and relatives. People tend to imitate and follow the crowd. In general, individuals prefer a crowded restaurant than an empty one. For Behavioral Economics there are other heuristic rules that lead to a decision: anchoring, availability, representiveness, memory, regret and others. These psychological traits do not mean that individuals are irrational but that emotion and reason are two parts of one integrated brain and that they cannot be separated. The

circumstance that system 1, the emotions, prevail in uncertain situations does not mean that people are irrational. In normal psychological conditions, system 2 or reason, is an important complement of emotion being an evolutionary feature of more complex social animals. Reason identified by Kahneman is not the same as economic rationality. Obregón continues affirming that man has an evolutionary animal heritage and his behavior is influenced by his emotions. Rationality sits in an old evolutionary brain whose main roots are not rational. Thus, it is true that men's behaviors are not just rational. Reason as stated by Kahneman is part of one complex unified brain that works together with a system containing emotions. Hence, rationality and irrationality cannot be distinguished in man's behavior.

The economic man is an abstraction useful for some specific economic problem, not a description of human nature. There are different abstractions of the economic man. Adam Smith refers to a soft rationality implying individual freedom allowing the market to work. This version is compatible with the Kahneman's two systems. Neoclassical School implies coherence and stability of preferences through time, which may be an abstraction that does not correspond to reality.

#### 1.1.2 Behavioral Economics in pills

Darling, Datta, and Mullainathan in their essay (2013), clarify some common misunderstandings about what is Behavioral Economics.

Behavioral economics is not about controlling behavior. According to Darling, Datta and Mullainathan, people fear that companies and governments use

Behavioral Economics to control people's behavior. This is partly right, behavioral economists can act as marketers pushing people to do what others want them to do. Nevertheless, good behavioral intervention helps people to avoid making a decision that they would consider a mistake. The aim of behavioral tools indeed is about helping people making the choice that they want to make, to realize their own good intentions.

Behavioral Economics is not liberal (or conservative). Darling, Datta and Mullainathan sustain that applied Behavioral Economics is ultimately about have a better understanding of human decision-making process, to identify and diagnose a variety of problems whit the purpose of design tools that can help to solve them. These tools can be used to pursue many different policies, independently on which government or company use these tools.

Behavioral Economics is not about "irrationality". The word irrationality nowadays is used with a negative acceptance, so according to Darling, Datta and Mullainathan is not correct using it to describe human behavior. People are usually clever but the human brain is not infallible and in some circumstances, there can be occasionally a mistake. For Behavioral Economics is important to understand the context that led to made that mistake. In economics rationality have a specific meaning, it refers to the assumptions that economists use to describe people's preferences, and these assumptions are not descriptive but are used just to reduce complexity. Rationality as economists intend is not always found in everyday life. Behavioral Economics

instead, is built upon psychology, not mathematics. Psychologists study the human behavior, as it is not trying to assume some aspects of it.

### 1.1.3 Examples of Behavioral Economics critics on Neoclassical Economics

Armstrong and Huck (2010) move a critic to the assumption of firms as rational and profit maximizer. This assumption has two possible explanations: economies of scales in good decisions and competition among firms. Regarding the economies of scale, this rely on the fact that consumers could take some decisions just once in their life so it's not needed invest too much effort on that. Firms indeed are used to deal with many customers, this imply facing hard decisions more often, and taking the right decision is crucial. As opposed to consumer, firms face competition in the market. Being a firm able to take good decisions, may lead to optimize profits at the expense of less capable firms.

Armstrong and Huck in their survey (2010) showed several situations in which the assumption of firms as rational decision maker was not respected, leading to an offset from the profit-maximization paradigm. In certain unpredictable environments, the profit maximization problem is too hard and firms are constricted to recur to rule of thumb or to imitate the actions of other firms operating in the same or in different markets. Sometimes non-maximization behavior derive from the difference of managers' aims from the profit maximization. This could be due to selection effects (for example over optimism regarding the profitability of some actions) or because the principal decided to give to the manager distorted incentives

to reach the strategic advantage. As well as the two reasons cited above, also the “social” preference may play a role.

Berg in his paper (2006), highlight some discrepancies between a Neoclassical approach regarding labour and one intended from a Behavioral Economics point of view.

Neoclassical economics usually assume constant effort comparing human capital to physical capital. Nevertheless, is difficult to compare a man with a machine. Effort is influenced by physical weariness, so the output and the cost of the tenth hour of work for a machine is completely different from the output and the cost of the tenth hour of work for a human being.

Regarding the structure of the workweek, Neoclassical economics suggests that compressing the workweek (from five days of eight hours to four days of ten hours) should reduce absenteeism and discourage from working too many high-wage overtime hours. This can be explained by the higher cost of missing a day of work, and by the fact that the marginal disutility of overtime hours, in a situation of ten hours of work, is higher than in the classical overtime context. However workers appreciate worktime flexibility, there aren't empirical evidence about their cost saving effectiveness.

Another dissimilarity identified by Berg, regard the worker relative position in terms of income with his/her co-workers. Berg make an example to makes this statement clearer. Typically, a worker prefer to earn \$90.000 in a firm where the

average income is \$50.000 over a salary of \$100.000 in a firm where the average is \$200.000.

According to Berg the Neoclassical theory, predict that “as long as worker’s time horizon is longer than a day, workers should work longer on high-wage days and rest when the cash wages forgone are low” (N. Berg “Behavioral Labor Economics” 2006, MPRA Paper No. 26366, pp.17). It happens that there are no matches between the reality of facts and the theory, because the latter don’t take into account the concept of loss aversion; in which a particular level of consumption plays a dominant role. A one-unit reduction in consumption generates a loss of utility bigger than the utility gained from a one-unit increase. This imply that workers could choose to work until overtime pay rates are about to start, stop working when the wage level increases. Behavior like this, appear without any logic in Neoclassical labor economics, in which workers work up to the point in which the wage overcome the marginal disutility due to another hour of work.

The last difference identified by Berg regard the efficiency wage model. This model assume that effort increases as a function of the real wage, and therefore there exist a unique point on the effort curve that maximizes effort per dollar of real wage, called efficiency wage. The efficiency wage model implies that, as long as the effort curve is fixed the real wage paid by firm is rigid, don’t allowing adjustments during recessions or when labor supply is in excess. Profit maximization implies that firms choose the efficiency wage, which is above the wage level that would clear the labor

market. Unemployed cannot bid down their wage because firms are aware that the higher costs associated with shirking outweigh the savings on wages when hiring additional workers. In this moment, psychology comes into play; in fact, there exist a gap concerning workers satisfaction with their jobs and being unemployed. At lower wages, workers are indifferent between working and being unemployed, so there are fewer incentives to work hard making reasonable for firms to fire workers instead of lowering wages. Conversely, at higher level of wages, workers are agreeable to supply additional effort to reciprocate for the employer's willingness to pay more than the minimum possible. Psychological researches has revealed some schemes among workers' mental state and their productivity. Unemployment hurts productivity; lower productivity depresses labor demand, which worsen further unemployment. Efficiency wage theory implies that the threat of dismissal is a motivator that lead employees to supply high level of effort. Darity and Goldsmith in their work (1996) criticize this concept emphasizing that threat of unemployment is an emotional toll that can reduce productivity (which can be reduced also by the effort spent on searching for another job) instead of motivate workers to put more effort.

To conclude, Berg state that instead of rejecting Neoclassical concepts, such as profit maximization and equilibrium, the behavioral approach is more about the expansion and generalization of these concepts, defining Behavioral Economics as "an expansion upon rather than a departure from the psychological foundations of

Neoclassical Economics” (N. Berg “Behavioral Labor Economics” 2006, MPRA Paper No. 26366, pp.3). Behavioral Economics pursue a path of generalization rather than revolution, in which behavioral methods include or overlap with Neoclassical ones. In behavioral economics, empiricism trumps ideology, opening to the possibility of imperfections on decision-making process.

#### 1.1.4 Clarifications on Behavioral and Neoclassical Economics dualism

Obregón (2018) sustains that Behavioral Economics introduced the psychological basis of economic behavior. As already mentioned before, despite its undeniable success this is not enough to become a new paradigm in economics. Behavioral Economics describes the psychological behavior of the economic man arguing that is not rational. Kahneman in 2002 won the Nobel Prize for economics but at the same time many other economist that sustain the rationality of the economic man won the prize as well. Given that the Nobel Prize is supposed to be assigned for concrete discoveries that benefits the human kind, how is it possible that winners have an opposite view of the human nature? To make things even more complicated Amartya Sen won the Nobel Prize in 1998. Sen shares the Behavioral Economics concept of a social being not rational man, capable of altruism and social cooperation, but according to him man is guided by reason and not by emotions. According to Obregón, this means that there may be diverse theories explaining the same phenomena in different ways. However, all these different versions of the economic man can explain distinct aspects of economic reality in a satisfactory way.

The economic man doesn't really refer to the nature of the human, is an abstraction which refers to the relationship of the individual with the society in those matters of economic order.

“The conception of an economic man was always a theoretical abstract construct aiming at understanding the social institutional characteristics that made a society highly productive. They all recognize that human behavior was complex, defined by many factors, emotive and heavily influence by the immediate social group and the society as a whole to which the individual belongs. The description of the economic man never had the purpose, as it is frequently argued today, of reducing human nature to a rational man.” (C. Obregón, “Beyond behavioral economics: who is the economic man”, 2018, MPRA Paper No. 89653, pp 9).

According to Obregón the first author that ever described the economic man in a proper way was Adam Smith in the *Wealth of Nations*. Smith was a philosopher and a professor of ethics so for him it was clear that emotions are central in explaining human behavior and that, men are deeply influenced by the group and the society to which they belong. Assumed that, Smith in the *Wealth of Nations*, created the economic man abstraction just to explain why England economic development has been higher than in Spain and Portugal. Smith clearly understood, as did most of the old Neoclassical economists, that the individual relationship with the society goes well beyond economic issues. Humans and econs are not

comparable. Humans is a description of the full-blown behavior of real man, econs refer to a very specific behavior under a particular institutional arrangement. Humans refer to the nature of man, the abstraction of the economic man refer to a specific human behavior in a particular institutional setting. Neoclassical economics were aware of this complexity too. Simply they were looking for something else, trying to formalize mathematically, how individuals' economic decisions relate to the economic welfare of the whole society.

Obregón confirm the great impact and contribution of Behavioral Economics in highlighting that, due to psychological characteristics in certain decisions, market failure can be produced. Nevertheless, there are two reasons to go beyond it. The first one is that humans as presented by this school of thought does not explain many critical economic problems. Behavioral Economics is not an alternative to traditional economics, it is just a new school of thought born because of the failure of contemporary Neoclassical school. The second reason is that humans, as described by Behavioral Economics, are not a good representation of man's evolutionary characteristics. For Behavioral Economics, humans are emotional beings that display altruistic and social cooperative behavior, even in monetary transactions, which often do not know what is best for them. However, evolutionarily we are neither design to be emotional or rational, nor to be selfish or altruistic and socially cooperative. We are design to be flexible for survival purposes, and to display a wide range of behaviors. Man indeed have two

evolutionary instincts, selfishness and belonging. The humans of Behavioral Economics is focused only in the individual characteristic and not in the individual relation with the social group and the environment.

To conclude, Obregón, state that even assuming strong rationality, the institutional arrangement is the key. Despite the strong rationality assumed by Neoclassical economists, they have provided economic profession with solid mathematical models, which have been useful to further understanding several economics problems. On the other hand, Behavioral and Sens School of economic thought had explored new routes to understand what defines the same economic problems in another way.

## **1.2 INTRINSIC MOTIVATIONS**

In the previous paragraph has emerged that workers or people in general can be driven by emotions and act in many different ways, sometimes irrationally. This concept is strictly linked to the concepts of incentive and motivation. In economics is possible to use alternatively these two terms. Economists typically emphasize the role of incentives in guiding and shaping human behavior without making much reference to motivation, as if they are simply two different ways of representing the same thing. The problem is that human motivation is far more complicated and incentives, monetary or not, represent just a part of it. The aim of this section is to

analyse which are the causes that induce people to perform a task rather than another or for example workers to exert more or less effort in their job.

Motivation has being a central issue in the field of psychology but is as well important for economists because in the real world motivations “produces” say Ryan and Deci in their work (2000). Being motivated means to being moved to do something. A person who feels no stimulus or inspirations to act is defined as unmotivated, whereas someone who is animated and driven toward reach a goal is considered motivated. People are not only more or less motivated, but have also different kind of motivations, which are not only due to different biological endowments, but also influenced by the social environment. This means that people in certain culture or situation could be more motivated than in others.

Ryan and Deci, two psychologists, developed in 1985, the self-determination theory (SDT) an approach aimed to analyse human motivation and personality. Self-determination is described as a continuum in which is possible to distinguish different kind of motivations. At one of the poles of the self-determination continuum there is amotivation, the state of lacking the intention to act. In the middle there are four different kind of extrinsic motivations from the least to the most degree of autonomy. At the opposite pole of amotivation there is intrinsic motivation. The different degrees of motivation reflect how the value and regulation of the requested behavior have been internalized and integrated by the individual. Internalization regard people’s assimilation of a value or behavioral regulation,

meanwhile integration refers to the transformation of that regulation into their own sense of self. What emerges from the theory, are also three psychological needs that are at the basis of self-motivation and personality: competence, relatedness and autonomy. These needs are universal but this not imply that they could change during lifetime or that are the same in all cultures. Satisfy these needs is essential because conduces towards health and well-being, but if not satisfied contributes to pathology and ill-being.

“No single phenomenon reflects the positive potential of human nature as much as intrinsic motivation, the inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities to explore and to learn.” (R. Ryan and E. Deci, *“Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being”*, 2000, *American Psychologist* Vol 55 No. 1, pp 70). From birth onward, humans are active, curious and display a readiness to learn and explore. This natural motivation is a critical element in cognitive, social and physical development because it leads to develop knowledge and skills. Ryan and Deci define intrinsic motivation as a natural inclination toward assimilation, spontaneous interest and exploration, which result in high-quality learning and creativity that are essential to cognitive and social development.

For Ryan and Deci (2000), the doing of an activity for its inherent satisfaction rather than for some separable outcomes, define intrinsic motivations. When intrinsically motivated a person is moved to act for the pleasure or challenge rather than external

rewards or pressures. Ryan and Deci add also that a sense of intrinsic motivation can exist within individuals but also in the relation between an individual and an activity. This means that people are intrinsically motivated for some activities and not others.

Bruno (2011) simplify this concept, stating that any motivation that is endogenous to the individual or is not provided by someone else is intrinsic. The influence of intrinsic motivation is easy to be identified when economics theory expects some behavior but something else happens, for example volunteer workers. In other situations, is more difficult to understand if there is presence of intrinsic motivations or just a manifestation of underlying preferences.

Bruno (2012), referring to the works of Linderberg (2001) Meier and Stutzer (2008) and Benabou and Tirole (2003), indicates four goals of human behavior that are relevant if intrinsic motivation occurs.

1. Pleasure to perform the task. Engage an activity because the activity itself is pleasant. Individual preferences are linked to the activity, no one else is involved.
2. Desire to succeed in performing the task. Intrinsic motivations are identified with the probability to succeed. The probability depends on the difficulty of the task and the individual self-confidence.

3. The warm glow. Is an impure form of altruism motivated by a selfish desire to reinforce prestige, respect and social approval. It is provided by the society but is intrinsic in the individual but could also be intrinsic in the activity.
4. Social preferences. Choices directed by an internal emotional goal that regards other people welfare. It could not be intrinsic to the activity.

An increasing social involvement of the individual can be observed moving from the first to the fourth category. Pleasure to perform the task imply in fact a pure individual gratification, the warm glove being accepted at social level, meanwhile social preferences regard the predilection toward other well-being rather than the own.

#### 1.2.1. Locus of control, self-esteem and self-determination

Locus of control is a term used in psychology that denotes individuals' beliefs about what causes the good or bad results in their life. Locus of control can be internal, if people believe that they control themselves their life, or external, if people believe that the environment or other people control their decisions and their life. Locus of control is strictly linked to two psychological processes that affect intrinsic motivation: self-determination and self-esteem.

Ryan and Deci as a part of cognitive evaluation theory, CET, (2000) describe self-determination with the aim of explain variability in intrinsic motivation. According

to cognitive evaluation theory people must not only experience competence or efficacy, but also they must experience behavior as self-determined for intrinsic motivations to be evident. At the time when people perceive an external intervention as reducing their self-determination, intrinsic motivation is substituted by external control. In this case, the locus of control shifts from inside to outside. The self-determination process is relevant in all the categories of intrinsic motivation listed formerly. Bruno (2011) affirms that people with higher internal locus of control tend to attribute outcomes of events to their own. This implies feeling higher self-determination increasing the satisfaction coming from intrinsic motivated activity.

The second psychological processes, the self-esteem, reflects an individual's evaluation of his/her own worth in any activity. Self-esteem is higher when there is coincidence between real self and ideal self. Meanwhile self-determination always undermines intrinsic motivation, self-esteem mechanism can be supportive or discouraging, depending on the individual evaluation of his/her perceived worth in that activity. Self-esteem can be reduced if the individual experience results under their expectations, in this case the real self appears smaller than the ideal self. At the contrary results over the individual's expectations imply higher self-esteem since the real self appears to be higher than the ideal self. Bruno adds that the self-esteem process is relevant in agent choice only if the intrinsic motivation is

performance related, since the matching of ideal and real self has a meaning when performance have to be measured.

By referring to these two processes, Bruno (2011), distinguish intrinsic motivation in input and output oriented. Intrinsic motivation is input oriented when it is not directed toward the output dimension of the activity. If intrinsic motivation concerns the pleasure to do something, the individual is focused only on doing the activity and learning by it increasing his/her competences. Individual's satisfaction does not depend on his/her ability to perform the task or in the task difficulty. Self-esteem is not related to the pleasure resulting from an activity such as reading a book or listening to music. In this case the agent doesn't care about the result of his/her performance. Self-determination instead depends on the activity done; if self-determination supports the pleasure to do something the individual feels autonomy as a part of his/her pleasure.

When the aim of the intrinsic motivation is the output of the activity, the intrinsic motivation is output oriented. In this situation, the individual is intrinsically motivated to succeed in performing a task and the self-esteem must be taken into account.

Concluding, self-determination concerns autonomy and competences of the individual and affects the input dimensions of intrinsic motivation. Self-esteem

derives from the evaluation of results (real self) and expectations (ideal self) and influences the output dimensions of intrinsic motivation.

### 1.2.2 General framework of Bruno's intrinsic motivations and goals model of 2011

In the model of intrinsic motivation presented by Bruno in 2011 the preferences are characterised by the weight that motivations have on individual behaviour. The utility function is composed by: consumption goods ( $C$ ), which contribute to higher material welfare and the correspondent amount ( $D$ ) that impacts on the emotional well-being.  $D$  match to how many gifts, donations and so on an individual have given. In the same way, time can be used to reach a material purpose. Consuming pure leisure ( $T$ ) or an intrinsically motivated objective ( $Y$ ).  $Y$  provides an output without any other explicit formalisation than a feeling, like the pleasure to perform a task, the desire to succeed in performing a task, the warm glow deriving from an activity or the others' satisfaction deriving from a task. The motivated output  $Y$  is produced through  $A$ , that is the individual effort, measured in units of time. The relation between  $Y$  and  $A$  describe how the motivated good (the goal) is linked to the time spent to produce it (the input). This relation depends on the specific goal individual pursues: if the goal is an input oriented motivations, only the self-determination process can affect the relation between units of time and goals. In the other case, when output oriented motivations occur, the self-esteem process affects the productivity of effort. According to the locus of control theory, each individual

has an external-internal belief on what influences his performance  $Y$ . Locus of control ( $K$ ), denote the individual belief that internal variables influence  $Y$  so that  $Y=Y(A,K)$ . Denote  $\gamma$  as the weight intrinsic motivation has in directing individual behaviour and  $1-\gamma$  as the corresponding weight of extrinsic motivation parameters describing the individual preferences. The Cobb Douglas utility function is presented as follow:

$$U = [CT]^{1-\gamma} [Y(A,K)D]^{\gamma}$$

Individual beliefs that internal variables influence  $Y$ . People with higher internal locus of control tend to attribute outcomes of events to their own control and feel higher self-determination; this enhances the satisfaction coming from intrinsic motivated activity. Conversely, if the control effect of increasing rewards has a negative impact on self-determination, higher rewards will correspond to lower levels of the motivated object  $Y$ .

### 1.2.3 What conditions enhance (or diminish) workers' intrinsic motivations?

Despite the fact that humans are liberally endowed with intrinsic motivational tendencies, the evidence is clear that the preservation and enhancement of this inherent propensity requires supportive conditions.

Dickinson and Villeval (2008) through a laboratory experiment compare two alternative views regarding workers' reaction to monitoring activities exploited by the employer. From the social psychology point of view, monitoring workers during

the working hours, lead to a diminishing of effort. Monitoring could reduce the intrinsic motivation of the task, which would reduce agents' self-esteem or self-determination. This assumption is in contraposition with the agency theory, which imply an increase in working effort due to monitoring activities from the employer. The increase in effort is done to reduce the probability of a sanction if caught shirking.

In Dickinson and Villeval experiment, workers which perform the task are informed about employer's monitor choice. Two type of treatments are set up, distant or interpersonal, characterized by different employer-employees approach. What emerges from the experiment is that the disciplining effect of monitoring, predicted by agency theory, dominates in both treatments meanwhile there are also evidences of a reduction in intrinsic motivation in the interpersonal treatment.

The interaction between principal and agents is also analysed in Eriksson and Villeval work (2010). Employee-employer relationship is characterized by trust and fairness, which can be expressed through non-monetary reward, called symbolic rewards, such as ex-post action feedbacks that agents receive after they have done something. There can be two types of feedback; one is the quantitative evaluation of employee's performance, the other one is a subjective evaluation regard the employer satisfaction with the behavior of the employee. The importance of symbolic rewards derive from the fact that people are motivated by what other think

about them (self-regarding motives), not only by what others do to them (other-regarding preferences). Having said that and due to the existence of esteem needs, the expression of respect, as a symbolic reward, is a signal of attention and praise for the employee effort. Symbolic rewards have an influence on the employee's motivation only if the employer is perceived as a reputable and reliable person with good intentions. From the employer point of view using costly non-monetary rewards to praise workers effort is associated with a little lower wage level and higher profit. For the employee instead, symbolic rewards increase the likely to accept another job offer from the same employer with an increasing level of effort. Symbolic rewards are not public and can be differentiated from status-improving elements.

One of the key question of the Eriksson and Villeval work (2010) is whether the use of symbolic rewards is affected by market conditions or strategic considerations. If employers use more symbolic rewards when there is an excess demand condition, and less in excess supply conditions, this means that employers praise employees to be better able to retain them when they have to compete with other firms. This imply that symbolic rewards can be used for strategic considerations. Nevertheless, the experiment made by Eriksson and Villeval (2010), show a similar use of symbolic rewards in excess supply conditions and market balance conditions; meaning that non-monetary rewards are not used

strategically to deal with competition on labor markets. Respect is expressed as a response to employee's higher effort not to increase the probability to hire again the worker. Symbolic rewards contribute to establish relational contracts and are less used once is clear that this kind of relation is established; however they are an example of relational incentives that soften the agency theory problem promoting identity and self-image.

Ishida (2011) identify autonomy as having a discrete influence on determining the level of human motivation. Indeed, people tend to be intrinsically motivated if they made their own decision to do something. A confirm to this can be founded in the cognitive evaluation theory, which state that external forces undermine the fundamental need of autonomy of an individual, leading to a shift of the locus of causality from internal to external. Ishida keep explaining that an action that is chosen among different alternatives is more likely to be of some value for the workers. In contraposition authority and control, that means less autonomy, has some impact on worker's motivation. The agent can perceive an action as imposed from the outside (employer) and not according with his/her preferences. Ishida adds that there is a link between the complexity of the task and intrinsic motivation, identifying the latter as a key ingredient to achieve creativity. This imply an higher decrease of motivation the more the task is complex or require creativity.

Osterloh and Frey (1999) recognize that the organizational form of a firm can influence intrinsic motivation since they are crucial to the tacit knowledge generation and transfer inside it. Tacit knowledge is the bases in order to obtain a sustainable competitive advantage in the referring market. It is assimilated by individuals and cannot be traded as a separate entity. This feature makes this type of knowledge fundamental to acquire a competitive advantage since is difficult for competitors to imitate it. As well, the contribution of a singular individual to the creation of this knowledge can't be measured and paid accordingly, leading to motivational ramifications. One is the participation, which means an agreement of common goals able to raise perceived self-determination and improving intrinsic motivation. Another is the personal relationship, a precondition for establishing psychological contracts based on emotional loyalties, often called team spirit. Different organizational forms are able to undermine or enhance participation and personal relationship capable in turn to influence intrinsic motivation. An example is team-based structure able to enhance personal relationship.

### **1.3 EXTRINSIC MOTIVATIONS**

Deci and Ryan (2000) define extrinsic motivations as an activity done in order to attain some separable outcome. Especially after the childhood the freedom of being intrinsically motivate decrease due to social demands and roles that require people

to assume responsibility for no intrinsically interesting tasks. Differently from intrinsic motivations, extrinsic refers to the instrumental value of doing an activity rather than the enjoyment of doing the activity itself. Extrinsic motivation can have different degrees of autonomy. Ryan and Deci to clarify the statement provide an example. A student who does his/her homework only to avoid parental punishments for not doing it is extrinsically motivated in order to obtain the separable outcome of avoiding the sanctions. Likewise, a student who does the homework because he/she personally believes that it is valuable for his/her future career is also extrinsically motivated because it is done for the instrumental value related to doing the homework, rather than because it is interesting. This is valid not only for students but also for workers as well.

As a part of the self-determination theory, Ryan and Deci developed a sub-theory called organismic integration theory (OIT) to point out different forms of extrinsic motivations and the factors that enhance or obstruct the internalization and integration of the regulations for these behaviors. The four types of extrinsic motivations are: external regulation, introjected regulation, identified regulation and integrated regulation.

The externally regulated behavior is the least autonomous among the extrinsically motivated behaviors. Such behaviors are made to please an external demand or reward contingency, and are perceived by individuals as controlled or alienated.

Introjected regulation involve the acceptance of a regulation but it is not perceive as totally owned. Behaviors are performed to avoid blame or anxiety or to attain ego enrichment such as pride.

Regulation through identification reflects a conscious valuing of a behavioral regulation. The action is accepted or owned as personally important.

The most autonomous type of extrinsic motivation is the integrated regulation. Integration occurs when regulations are fully integrated to the self, which means that are congruent whit an individual values and needs. Actions characterized by integrate motivations have in common with intrinsic motivation many features but them are still considered extrinsic because done to attain a separable outcome rather than enjoyment.

### 1.3.1 Integration of extrinsic motivations

Ryan and Deci (2000) as a part of the organismic integration theory, identify also some social condition that allow the internalization and integration of extrinsically motivated behaviors. All the conditions that allow an extrinsic motivation to be integrated and internalized by an individual, are linked to the satisfaction of the fundamental needs identified in the self-determination theory.

Extrinsically motivated behaviors are not usually interesting, the main reason why people perform such actions is because they lead to be attached or related to other

people who perceive these actions as important, the family, a peer group or the society. Relatedness and the desire to be connected to others or belong to a group are important for internalization.

The internalization of extrinsically motivated actions is also a function of the perceived competence of being able to accomplish a task. People tends to internalize activities when they feel effective with respect to those activities.

The context in which a person is involved play a fundamental role because it can influence the way in which a regulation is perceived. Autonomy as well relatedness and competence is important to eases the integration of regulation.

## **CHAPTER 2**

### **PRO-SOCIAL BEHAVIOR AND RELATED CONSTITUENTS**

#### **2.1 PRO-SOCIAL BEHAVIOR: AN INTRODUCTION**

Behavior can be defined as an action in response to a cause or stimulation, which changes an agent's relationship to his/her environment. Behaviors refers to how a person behaves toward other people or the environment.

Pro-social behaviors are voluntary behaviors intended to benefit another. They vary from everyday courtesies, such as allowing someone to merge into traffic, opening doors or donate some money for charity, to heroic actions like the ones done by police officers or firefighters that risk their life to help others. Nevertheless, pro-social behaviors are any act performed with the goal of helping another person motivated by altruism or self-interest. Anti-social behaviors on the contrary are behaviors that violates the rights of people who lives in a community or actions that members of a society find objectionable even if they are legal.

Fairchild (2018) identify some individuals' features that affect pro-social behaviors. First, individual differences matters. Some people show a more "altruistic personality" and are more concerned to help other than themselves. Meanwhile, some other people are more self-centered and less likely to help others. Pro-social thoughts can be seen from individuals, which have a higher probability to

experience empathy as a sense of responsibility toward other people. Second, people who view religion as a way for answer life's bigger questions are more altruistic. Third, however sex differences in helping behavior are dependent on the situation, women have more pro-social and altruistic tendencies. Men on the other side are more likely to work in occupation in which the aid is part of the job description such as firefighters and police officers. Four, people are more likely to help individuals that they consider worthy of assistance. Emotional arousal is an important motivator. If individuals feel empathy toward who need the aid, is more likely that they would give the aid. Concluding, cultural differences can differ significantly in the expression of pro-social behaviors. Collectivist cultures, like in Asia or Africa, emphasize more others well-being and the interdependence of relationships than individualistic one.

To increase pro-social behaviors, Fairchild suggests challenging individualism and self-concern promoting a more collectivist orientation since the childhood. Pro-social and anti-social behaviors fall on a continuum, so to encourage pro-social behaviors is needed to decrease or eliminate undesirable social behaviors. Parents and teachers should find ways to encourage and reward pro-social behaviors. One way to enhance pro-social behaviors could be to develop television programmes that stimulate children to appreciate the advantages of altruism, cooperation and non-violent conflict resolution. Some programmes such as the ones of Disney

Channel or Cartoon Network that show more acts of altruism than adults channels programmes, may evoke pro-social behaviors in children

### 2.1.1 Pro-social behaviors in market exchanges

Fosgaard (2012), study the presence of pro-social behavior in market exchanges. This phenomenon has increased a lot in the recent years. An example is Starbucks Red, a special coffee series from the American multinational. When someone buy a Starbucks Red product, a fraction of the price is given to the Global Fund, a foundation that fights HIV/AIDS in Africa. American Express provides another example. Customers who uses American Express credit card earn reward points that can be redeemed as charity donations. The experiment conducts on university students, compares pro-social behavior in a repeated public good game played in two different treatments. Market treatment in which the public good contribution occur in a market for a private good. Non-market treatment in which the contribution occurs directly with the public good. What emerge is that the emotional responses in the two treatments differ. From the study, emerge that the context influence people to act pro-socially or not and is related to the emotions experienced. In fact, emotional effect of acting pro-socially in a market context is different from the effect of acting pro-socially in a non-market context. Nowadays is common for consumers to support good causes at the same time as they purchase private goods. There is a thought to all this, a market exchange context entails lower

positive emotion and less emotional response to others' social decision. Market based provision of pro-social behavior is popular because of the strong signal/image value, but it holds adverse emotional consequences. As a consequence the degree of pro-social behavior in market context is lower compared to non-market situation.

### 2.1.2 Pro-social behaviors in working activities

Pro-social behaviors are not only found in activities such as volunteering or blood donating, but also in working activities such as the supply of public goods. This kind of goods or services have large social returns above private returns. Besley and Ghatak (2018) developed a model aimed to explain the provision of public goods by the private sector. Classical frameworks identify the public sector as the most suitable to provide public goods, while private sector to be more suitable in providing private goods. Nowadays, there are clear evidences of the contrary, public goods supplied by the private sector are not under-provided as believed by frameworks that are more classical. First, there are large presence of market failure in the public sector due to corruption, absenteeism and poor quality of services. Second, the importance of private social-sector organizations such as no-profits and NGOs is increased making too restrictive the provision of public goods just through governmental agencies.

In the Besley and Ghatak framework (2018), the goods or services produced has a social component and the workers are motivated agents that care about the output

that they produce. In the model, several forms of non-pecuniary motivations are identified such as being altruistic, being committed to a mission, being conformed to an identity and reputational or status concerns. What emerge from the model is that non-selfish motivation, and financial incentives are most often substitutes. Also that the selection of the right person committed on a pro-social goal matter, for a more efficient provision of the public good.

Francois and Vlassopoulos (2007) have a different point of view with respect to Besley and Ghatak regarding the private sector as the most suitable provider of social services. As explained by Ghatak and Besley, the role of the governments as traditional social services provider, has been increasingly challenged by the role of the private sector. Francois and Vlassopoulos argue that when pro-social motivations are taken into-account the public sector continue to have an important role in providing such services. In this situation, exertion of effort engendered by pro-social motivations are enabled only by the presence of public institutions. According to Francois and Vlassopoulos, manifestation of pro-social motivations in a workplace context, which involve the provision of social services, imply that workers engaged in providing the service earn non-monetary benefits. Workers may have a genuine concern about the recipients of the service or by virtue of the social recognition deriving for contributing to an important mission. Pro-sociality of employees has an important implication for the delivery of public services.

Therefore, whether the firm produces a good or service that the agent considers worthy is possible that the agent obtain a benefit from the effort put to perform the task.

### 2.1.3 The opposite sides of Pro-Social behaviors

Bénabou and Tirole (2006) develop a theory of pro-social behavior, which combines inhomogeneity in individual altruism and greed with concerns for social reputation or self-respect. According to their model, individuals usually participate in activities that are costly to themselves and that mostly benefit others, such as volunteering, blood donating or joining rescue squads. Many subjects display altruistic or reciprocal behaviors but, other regarding preferences, are not the only driver of pro-social behavior. People perform good deeds and refrain from selfish behaviors only because of social pressure and norms that attach honor or shame. For example, in the case of charitable and non-profit institutions, donors could make donations only because they want demonstrate their generosity and selflessness or at least the appearance thereof. This imply the presence of a social signalling reasons for giving that can be confirmed by the fact that anonymous donations are extremely rare. People care about their self-image, namely the opinion others have of them. Psychologists and sociologists affirm that individuals' behavior is influenced by a necessity to keep conformity between their own actions and certain thresholds that they try to support.

Francois and Vlassopoulos (2007) identify two alternative ways of displaying pro-social motivation: action-oriented altruism and output-oriented altruism. In a situation of action-oriented altruism, the agent derives benefits from the accomplishment of what is considered a meritorious task. Apparently, the effect of the actions, which the agent cares about, lower the cost of performing it. On the other hand, output oriented people care about the good they produce. Indeed, the contribute in terms of effort, is higher with respect to the situation in which he/she do not care about the good or service provided. Output-oriented individuals know that by putting more effort the cause advance and they take care of it when deciding the level of effort

The two alternative views of pro-social motivations lead to some implications. Free riding is the first one. When altruism is impure, there are not free-riding problems because the intrinsic reward depends exclusively on his/her contribution to a mission that has a social impact. On the other side, if an agent is purely altruistic, he/she derives an intrinsic benefit from the project being successful without any regard to the contribute given. The second implication regard moral-hazard problems arising from purely altruistic situations. Individual agent is not the only contributor to advance a cause about he/she is concerned. If a agent care about the level of services provided he/she wants to be sure that the effort exerted contribute effectively to the service provision. Moral hazard problem can arise if

the worker is unsure about how much extra effort provide to the creation of the social service. In this case the provider of the service, such as a principal or a manager, who controls inputs that contribute to the production of the social good, must be able to elicit this effort based on care, only when is possible to ensure that the effort effectively contribute to the service. In a private setting, whether who runs the firm is a residual claimant, who cares strongly about the good cause but gains also financially if resources can be saved. Is possible that knowing to have a worker willing to exert extra effort he/she could reduce the level of the other inputs. More effort and the outputs are substitutable among them, more is likely that the principal would decrease the level of other inputs substituting them with worker's effort to obtain cost savings. In contrast, managers operating in a public setting, do not have the same incentives to reduce inputs when face extra contribution from motivated workers. Is possible for a government employee to be paid less than him/her would have been required to compensate for the disutility of effort. Consequently, managers have incentives to use further these inputs in the production of the service. There are no moral hazard problems in the case of input-oriented altruism. In this situation the workers know the effort provided and are intrinsically rewarded for it. Is possible to recognise from the different models of Bénabou and Tirole, Besley and Ghatak and Francois and Vlassopoulos some common points. Self-imagine, social identity concerns and social preferences (pure altruism) are part of each of

the previous models. These features are strictly related to some intrinsic motivation categories mentioned in the previous chapter: the social preferences, and the warm-glow. Assuming this linkage is possible to state that jointly, social preferences and warm glow are the two kind of motivations that contribute to create pro-social motivations.

## **2.2 SOCIAL PREFERENCES**

According to Fehr and Fischbacher (2002) economic reasoning is typically based on the self-interest hypothesis which imply that people are solely motivated by their material self-interest. This kind of assumption exclude any heterogeneity with respect to other-regarding social preferences. During the last decade, many evidences have suggested that a substantial fraction of people exhibit social preferences indicating that deviations from self-interest have a fundamental impact on core issues in economics. Social preferences, in fact, shapes the decisions of people altering the functioning of competition and governing the laws of cooperation and collective actions. An individual exhibits social preferences if the person does not only care about the material resources allocated to him/her but also to the material resources allocated to relevant reference agents, which are situational dependent.

Fehr and Fischbacher, identify four types of social preferences:

1. Preference for reciprocity or reciprocal fairness, a particular type of social preferences. A reciprocal individual responds to actions that are perceived to be kind in a kind manner, and to actions that are perceived to be hostile in a hostile manner. Whether an action is perceived as kind or hostile depends on the fairness or unfairness of the consequences and the intention associated with the action. The fairness of the intention is determined by the equitable payoff distributions among the set of plausible distributions caused by the action. Fehr and Falk (2001), state that reciprocity is not driven by the expectation of future material benefit and that it differs from “cooperative” or “retaliatory” behavior in repeated interactions. This kind of conduct arise because agents expect future material benefits from the action. In the case of reciprocity the actor, respond to friendly or hostile actions even if no material gains can be expected. According to Fehr and Falk, reciprocity-driven voluntary cooperation, plays an important role in the context of the provision of public goods. Many people increase their contribution to a public good if others do the same even though they have a strict incentive to contribute.
2. Inequity aversion. An inequity averse person wants to reach a fair distribution of material resources. This means that they are altruistic towards other person when the aim is to increase other’s material payoff if it is below an equitable benchmark. On the contrary, it happens that inequity averse

people feel envy when other's payoff exceed the equitable level aiming at decreasing this disparity. Reciprocal and inequity averse people may behave similarly in many situations. Both reciprocity and inequity aversion imply the desire to reduce the payoff of another person if that individual made an action such that the payoff of the reciprocal or inequity averse individual is much lower than the other people payoffs. This similarity is due to the notion of fair or equitable payoff that is common for these two kind of social preferences.

3. Pure altruism. Altruism is a form of unconditional kindness meaning that altruism given does not occur as a response to altruism received. Altruism imply that an individual values the material resources allocated to a relevant reference agent positively. An altruistic person would never undertake actions that would decrease the payoff of the reference agent. Since altruism is a form of unconditional kindness it is not capable to explain the fact that many people are willing to increase voluntary cooperation in response to cooperation of other people (conditional cooperation).
4. Spiteful or envious preferences. Is important to keep in mind that not everybody exhibits social preferences. Many studies indicate that significant segment of people behave in a purely selfish manner.

### 2.2.1 Social Preferences and situational understanding

Jelle de Boer (2007) moves a critique to the classical literature on social preferences, stating that there are empirical findings that demonstrate the existence of social preferences, but there are also studies that indicate their fragility. Jelle de Boer for his treatment takes up to the Orma experiment made in Kenya by Jean Ensminger in 1985. The experiment related to public goods is one-shot and anonymous. It has a Prisoner Dilemma (PD) structure correlated with wealth measured as number of cattle. People with cattle made relatively high contributions in this game, but not so in other games like the Ultimatum Game (UG). On the other hand, Orma without cattle demonstrated the opposite pattern by making high contributions in the UG and low contributions in the Public Goods experiment. The Orma generally associated the Public Goods experiment with a *Harambee*, a Swahili word for fund-raising for local public projects, such as building a school. In an Harambee one is supposed to contribute in proportion to wealth. The major outcomes of the experiment are that the behavior of most experimental subjects contradicts the Homo Economicus model and that cooperative play in these games differ quite a lot. Jelle de Boer provide some hypothesis aimed to explain cooperative behaviors among the Orma tribe during the experiment.

The first hypothesis is that the Public Goods experiment may be designed and conducted as an anonymous one-shot game but participants don't perceive it as it was one-shot. Being them a tribe who believe in natural connections, they feel this

situation as another moment absorbed in their world with shared personal stories and consequences for the future. There are several critiques that sustain the unreliability of one-shot game stating that in real life people perform choices based on a sort of social historic fabric. Players in a game like the PD should not be able to see what others contribute, communicate their ideas and intentions to their co-players, influence other players in subsequent experiments (contagion), or be subject to experimenter's bias. Nevertheless, Ensminger, the anthropologist who conducted the experiment, was confident that there were the right circumstances during the experiment. Contributions were made anonymously. People were not allowed to talk. The experiment were done quickly to avoid news leak to nearby villages. Therefore, the experiment were assumed to work as planned. According to de Boer this would be a mistaken way of thinking because could be better to compare how same people perform the game repeatedly and not just with a single play. Test done regarding this matter show that the major part of individuals play differently under these two conditions. This means that reputation is less important in single play game not that it is absent.

The second hypothesis provided by de Boer to explain cooperative behaviors in anonymous one-shot PD experiment are conditional social preferences. These imply the promotion of the other player well-being in the game. Conditional means that are based on expectations about whether the other players are going to cooperate. Anthropologists discuss the prospect of people with a general inclination

to behave socially. There is in fact, a growing consensus among social scientists, including economists, that people recurrently act on genuine social inclinations, and that the thesis of universal egoism is questionable. There are ample evidences that people are willing to collaborate in PD experiment depending on the expectations that the others are going to cooperate too, meaning that preferences have a conditional nature. Behave cooperatively just only when is expected that the other are going to do the same. Conditional preferences are dependent on expectations, which become part of the utility, making a difference not just for the individual's strategic choice but also for her/his utility. The experiment were made under the assumption that the Orma understand the difference between repeated and single play games. So why Orma cooperates in a one-shot game? The main answer is that they are used to do it. In an Harambee situation they cooperate based on their wealth. The experiment was not an Harambee situation but just a game. Nevertheless, they act like they would in those circumstances.

Jelle de Boer's third hypothesis refer to social preferences as a loop. Because of one player believes that the other is similarly inclined, an individual who take care about social preferences expects that the other people would do the same. This reasoning take the form of a loop. "My preference to cooperate is based on my expectation that you will cooperate. My expectation that you will cooperate is based on your preference to cooperate. Your preference to cooperate is based on your expectation that I will cooperate. Your expectation that I will cooperate is based on my

preference to cooperate. Our mutually referring propositional attitudes make up a loop. There are no loose ends; the reasoning is closed.” (J. de Boer “Social Preferences and Context Sensitivity” 2017, Games 2017 MDPI, 8, 43 pp. 6). Cooperatively inclined people in a single play PD believe that their counterpart is likewise disposed. Among the Orma experiment, de Boer identify two ways to signal social preferences. First, the Harambee is an instance of imperfect repeated play. The participants are not fixed as in a laboratory experiment. People move in and out, making difficult to keep track of past behaviors. Real life is full of information asymmetries. Second, social preferences are active during real-life repeated play. People typically do not just answer defection by equally defecting in the next round. They also get angry; they dislike what the other has done. However, social preferences should ripen through repeated play. It is supposed that repeated play should foster empathy and social preferences. Think for example sitting in a class everyday doing the same thing, it lead to mutual affection. Stable cooperation is based on the historical behavior of a person toward a group.

Jelle de Boer add also that social preferences are situational dependent. Cooperation can be influenced by the way in which a game is described to the participants. Using the word “partner” instead of “opponent” matters. Calling the game “Wall Street Game” or the “Community Game” lead to different outcomes. In the latter case is expected an higher grade of communication.

To conclude, de Boer state, “social preferences are a robust phenomenon contingent on corresponding expectations. Thus, they can thrive in an environment where an institution with repeated cooperative behavior is in place.” (J. de Boer “*Social Preferences and Context Sensitivity*”, 2017, Games 2017 MDPI, 8, 43 pp. 13).

### 2.2.2 Social Norms

As seen in the previous paragraph, sometimes can be difficult to understand if a behavior is driven by social preferences or is the outcome of social norms. Postlewaite (2010) state that there is not a common definition of what a social norm is. The term is used mainly to describe situations in which there is a commonality in behavior in a group of people, specifically when this behavior differs from the ones of a larger population. A group behavior to be considered a social norm cannot be explained simply because of optimization to the group’s physical environment. It’s not a social norm that Eskimos wear warmer clothes than do Guatemalans. It is rational for Eskimos, given the climate, dress differently than others. Although two communities have the same composition and physical environments, in similar circumstances they can behave differently. An example could be the American Amish communities who live without electricity or cell phone in the same territory with people who conduct a more “traditional” life. Social features of a community are relevant to understanding differences across communities, but as well for understanding decisions within a single community. It is common that people’s consumption behavior can be influenced by someone else buying decisions.

According to Postlewaite, preferences are to some degree socially determined. Individuals internalize preferences that reflect those of the society they live in. As a result, social environment influences agents' deep preferences. These so-called internalized preferences are the result of indoctrination. "I don't take a pen off my colleague's desk when she is out of the office even when I am positive I won't be caught. If I were asked why, I would simply say that I would feel bad about myself if I did that." (A. Postlewaite "*Social Norms and Preferences*", PIER Working Paper 10-019, pp. 6). Indoctrination take the form of parent's approval when the child behave in appropriate ways or disapproval when do not. If individuals in one group are indoctrinated to "enjoy" help others and behave cooperatively and another not is expected to see significant differences between the two groups. Postlewaite continues adding that people can be acculturated by the society they are in identifying two types of acculturation process. Active when the behaviors are consciously chosen with the purpose of form particular preferences into the individual. Usually it involves costly effort to affect the preferences of the young. Passive when imposing a certain behavior was not the scope of the individual whose shape the preferences. Examining how deep preferences are shaped within a society can provide a profounder comprehension of differences in economic performance across societies.

Postlewaite in his work discuss also about reduced form preferences, which could differs from internalised ones. An example he provides is working or staying home.

An agent can work today not because his/her prefer more working than staying home, just because working today is necessary for being paid and consume. It is clear that in some situations preferences are socially influenced but is not noticeable whether socially influenced preferences are internalized or reduce form preferences.

### **2.3 WARM GLOW AND SOCIAL IMAGE CONCERN**

Economists for long have recognized altruism as the solely social preference integrated in economic activity. Andreoni (1989) formulate the notion of giving to produce a pleasurable feeling called warm glow. In this case the donor's preference is giving per se, distinct from the benefit enjoyed by the recipient. The warm- glow actions are driven by the desire of freedom or to act selfishly. An individual who experiences warm-glow values the availability of selfish options even if he or she is planning to act unselfishly don't taking care about the impact on the beneficiaries of the action

Evren and Minardi (2013) argue that there are pro-social motivations that depart from the traditional approach. Charitable donations for instance may be motivated by a desire for status, acclaim or self-satisfaction. Social image concerns can be found while carrying out pro-social activities. It happens that individuals perform altruistic activities to increase their social reputation and self-respect, meaning that

the performance of pro-social activities is responsive to social prestige attached to those activities.

Lacetera and Macis (2008) conducted a study trying to understand what lead people to act more pro-socially, assessing the impact of symbolic rewards on the performance of pro-social behavior. A symbolic reward can increase the motivations to perform pro-social activities without the drawbacks of a more material form of payment. A monetary reward can send a “bad signal” about the actual purposes behind the execution of an activity. Symbolic awards, on the other hand, may be less costly and help to create a special relationship between the awarding and awarded parties, increasing the self-esteem, social status and social recognition of the receiver. The question of Lacetera and Macis was if symbolic rewards are attractive per se or whether is the social prestige attached to receiving an award that matters. To answer to the question they analysed the effect of symbolic reward put in place by the Italian Association of Voluntary Blood Donor (AVIS) in a Center-North Italian mid-size town called for simplicity “The Town” between 2002 and 2006. The Association gives medals as symbolic reward when donor meet certain donation quotas. Some prizes are assigned privately while for others corresponding to an higher number of donations the award is given in a public ceremony and the donor name is published in the Association’s Bulletin and in the local newspaper. The Italian law sets limits to the frequency of donations of

blood and blood products. Whole blood can be collected once every 90 days from male donors and once every 180 days from females. Donors can give platelets once every 30 days and plasma once every 14 days. Lacetera and Macis for the model developed this regression function:

$$\text{Elaps}_{i,n,m,t} = \alpha + \beta_1 \text{Award}^{\text{Private}}_{i,n} + \beta_2 \text{Award}^{\text{Public}}_{i,n} + \beta_3 Z_{i,t} + \gamma_t + \mu_m + \delta_i + \varepsilon_{i,n,m,t}.$$

$\text{Elaps}_{i,n,m,t}$  is the elapsed time (in days) between individual  $i$ 's  $n - 1$ th and  $n$ th donations.  $\text{Award}^{\text{Private}}_{i,n}$  is a dummy variable equal to 1 if donation  $n$  is the 8th, 16th, or 24<sup>th</sup> donation and zero otherwise.  $\text{Award}^{\text{Public}}_{i,n}$  is a dummy variable equal to 1 if donation  $n$  is the 50th, 75th, or 100th donation and 0 otherwise.  $Z_{i,t}$  is a vector of control variables,  $\gamma_t$  and  $\mu_m$  are vectors of year and month dummies respectively, the error term is composed of an individual-specific component  $\delta_i$  and a "white noise"  $\varepsilon_{i,n,m,t}$ . The main important coefficient are  $\beta_1$  and  $\beta_2$ : they represent estimates of the changes in the donations lag in correspondence of private and public rewards respectively.

The results of the study shows that donors react to the symbolic award incentives by increasing their donation frequency, as the donation thresholds to receive an award is close. The change in behavior is significant only in proximity of the award, which are publicly given not to every award. The reduction in the lag between donations when the "public award" is close decreases by 30% just before the threshold is reached. The social prestige of being a donor with an high number of donations that are publicly announced is an effective incentive to increase the

supply of blood. Because of the 50<sup>th</sup> donation threshold is the first one to give the public recognition donors are particularly responsive to it. Given the fact that the ceremony is biennial, a reduction in the donation lag is present in proximity of the public award threshold when the public ceremony approaches.

#### **2.4 TONIN AND VLASSOPOULOS EXPERIMENTAL INVESTIGATION ON PRO-SOCIAL BEHAVIOR**

Tonin and Vlassopoulos (2011) conducted an experiment aimed to distinguish and quantify which are the motivations that persuades people to make donation charities. Besides extrinsic motivations, Tonin and Vlassopoulos identify as the intrinsic motivations for giving: pure altruism and warm glow. The main distinction between these two categories is that, people motivated by pure altruism care about the total amount of public good that is provided. In the case of pure altruism others' well-being enters directly in the utility function of the individual, therefore pure altruism is conditional on the donation being actually implemented. On the other hand, people motivated by warm glow care about his or her own individual donation, and the fact that the donation may not be implemented, does not erase the signalling benefit of a donation.

#### 2.4.1 The experiment

The experiment was conducted in the fall of 2009 at the University of Southampton on 251 subjects of diverse academic background. In the experiment participants were asked to decide how to allocate £10 in three different treatments:

- T1, the £10 had to be divided between the participants and the other subject of the experiment
- T2, the £10 had to be divided between the participants and a charity of their own choosing selected from a list of ten. Participants were informed that a top-up would be paid to their selected charity (the difference between £10 and what they would choose to pass). The selected charity in this way would receive neither more nor less than £10.
- T3, the £10 had to be divided between the participants and a charity of their own choosing, selected from the same list of ten charities as in T2

The order of the treatment is casual, so is possible to be subjected to T3 before T1. Participants were asked also to make three different decisions (A, B and C) in each of the three treatments, about how to allocate £10, by receiving sequentially three decisions sheets (DA, DB and DC). After the decision is made the monitor will randomly select one of the three decisions sheets and use only that one to determine payments.

### 2.4.2 The model

Tonin and Vlassopoulos (2011), to develop their model consider an individual endowed with wealth ( $w$ ) that can allocate this wealth between consumption of private good ( $x$ ) and a contribution to a public good ( $g$ ) so that  $x + g = w$ . Individual's utility function is represented by

$$U(x,c,G)= c(x) + Y(g) + \varphi(G)$$

$G$  is a public good the individual cares about and is given by the sum of his/her own contribution ( $g$ ) and others' contribution ( $\bar{g}$ ), so that  $G = g + \bar{g}$ . The utility function embeds a concern for own consumption as well as the two types of altruism. Warm glow is represented by the concave function  $Y(-)$ , which represent the enjoyment the individual receives thanks to his/her own contribution to a public good ( $g$ ). Pure altruism is captured by the last term of the utility function  $\varphi(-)$ , which implies that the agent is concerned about the total quantity of a public good ( $G$ ) that is provided.

Tonin and Vlassopoulos assume also that the agent is an expected utility maximizer and decides how to allocate  $w$  two consecutive times. Individuals are aware that at the end, only one of the two allocations will be selected. Randomly, with the same probability, and implemented. Important is to underline that the components of utility regarding own consumption and pure altruism are enjoyed only if a decision is implemented, since they depend on the allocation of resources. The warm glow component, on the contrary, may be enjoyed independently of whether the decision

will be carried out or not, due to the individual benefits from upholding the self-image of being a kind person. Furthermore, warm glow felt in each period may not be dependent only on the donation made in that period, but also on a fraction of the donation made in the previous period.

For the individual, the two allocation decisions are interrelated. The warm glow component of preferences is concerned, even though he/she knows that only one allocation decision will be implemented. Consequently, utility in the first period is given by:

$$U_1 = Y(g_1) + \frac{1}{2} [c(x_1) + \varphi(G_1)]$$

Utility in the second period is given by:

$$U_2 = Y(g_2 + \lambda g_1) + \frac{1}{2} [c(x_2) + \varphi(G_2)]$$

Where  $\lambda \in [0,1]$ ,  $G_i = g_i + \bar{g}_i$ ,  $i= 1,2$ . Assuming also that  $\bar{g}_1 = \bar{g}_2 = \bar{g}$ .

If there isn't a warm glow a warm glow component in the utility function ( $Y(-) \equiv 0$ ), decisions on period 1 doesn't have any impact on utility in period 2. Given that the individual face the same problem in each period  $g^*_1 = g^*_2$ . This means that, if the individual is solely a pure altruist, the period in which the decision is taken doesn't matter for his donation. Each decision is treated as if they were the only decision made. On the other side, if there is a warm glow component in the preferences and the impact of donating is lasting, a donation made in the first period

reduces the marginal utility of giving in the second period, expecting  $g^*_1 > g^*_2$ . This situation of a “temporary satiation” in warm glow giving, lead to a declining trend in donation.

### 2.4.3 Results

Evidence shows a decline in donations for all treatments. The decline is more pronounced between the first decision sheet (DA) and the second (DB) than from the second and the third decision sheet (DC). Furthermore, the decline is more marked for T1 and T2 than for T3. The considerable reduction between the first decision and the last one evidence the presence of an overall trend. The decline in donation can be attributed to a satiation of warm glow motivation and is not related to purely altruistic motivation as the latter operates only if a treatment is implemented. This imply that a lower bound for warm glow can be provided using the drop in giving across decisions in each treatment. In the case of T2 the drop in donation between the first (DA) and the last decision (DC) suggests that at least £ 1.66 out of the £ 2.80 that are given in the first occasion are due to warm glow (59%). The amount is smaller in the case of T1 (£ 1.34, 52%) and even smaller for T3 (£ 0.99, 21%).

In the case of T1, in which money may be donated to other participants and not to charitable organization; an alternative explanation for the declining in giving could be attributed to the fact that subjects’ decisions are influenced by perceiving the

other recipients as less worthy of help with respect to charities. This explanation does not account for why giving in T2 and T3 is declining, on the contrary the presence of charities, as recipients, should increase the donations toward them. This happens because other motivations, such as the misunderstanding of the rules from the experimenters, affect giving other than warm glow. Results are influenced also by the fact that the experiment is designed as a random lottery incentive (RLI) scheme in which only one decision is randomly selected to be implemented. This incentive scheme allow to observe for each treatment the same response as if the treatment would have been the only one a subject faced. In the case of Tonin and Vlassopoulos, warm glow results taken in isolation would not be the same as using an RLI scheme. Random lottery incentive provide evidences of a cross-treatment spill over of warm glow giving. For example, the amount of giving due to warm glow in DA is not equivalent to the amount of warm glow giving that would be observed if the experiment were conducted as a one-shoot experiment. The reason why is that the cost of a given decision, the forgone utility deriving from private consumption, is paid only if the decision is actually implemented multiplied by the probability of implementation. Meanwhile, the part of benefit represented by the warm glow component of the utility function is enjoyed regardless of an effective implementation of the decision. Given that, warm glow observed in an experiment designed with RLI scheme should be greater than warm glow in an experiment in which the decision is implemented for sure. The cost of giving in fact is contingent

on implementation, meanwhile the enjoyment due to warm glow is not necessarily so. On the contrary, the amount of giving due to pure altruism is not affected by the probabilistic implementation corresponding to the level obtained if the first decision is implemented.

Tonin and Vlassopoulos were also able to determine from the experiment, for which subject the amount of giving in T2 do not represent a clean measure of warm glow. By comparing the results of T1 and T2, among the 84 individuals who gave something in T2, 24 didn't give any money in T1. These subject do not display any altruistic feeling towards the experimenters, therefore giving in T2 represent a clean measure of warm glow. These participants are referred as "unreciprocals". The 60 individuals left, in which warm glow can be confused with pure altruism, were defined as "reciprocals". Unreciprocals' giving in T2 has been used to identify reciprocals' unobserved warm glow and then to calculate an average giving due to warm glow for the whole sample. Average giving in T2 and T3 for unreciprocals is lower than for reciprocals. Thus, reciprocals' warm glow motive is at least as big as for unreciprocals.

According to, Tonin and Vlassopoulos, giving in T3 is a combination of warm glow and pure altruism. To work out a range of giving due to pure altruism, the academics, subtract from average giving in T3 the estimates for warm glow derived from T2. In the first decision (DA) the amounts donated due to pure altruism and to warm glow in both treatments T2 and T3 are roughly equivalent. Pure altruism

should increase in following decisions, as warm glow is flagging, while the expectancy is that the purely altruistic component should remain constant across decisions. It is important to underline that measuring pure altruism by subtracting giving in T2 from T3 is not possible for succeeding positions in the decision sequence. Warm glow giving exerted in T2 when T2 is, for example, the last treatment handed out is different from warm glow giving embedded in T3 when T3 is the last treatment administered. Average giving prior to T2 when T2 is the last decision is £ 6.13, while average giving prior to T3 when T3 is the last decision is only £ 4.66. Therefore, the warm glow component of the utility function should be more satisfied in the former case than in the latter. Thus, subtracting the estimated warm glow from T3 in the second or third position would make a fuss the actual degree of pure altruism.

## **CHAPTER 3**

### **MONETARY REWARDS AND MOTIVATIONS: CROWDING-OUT**

#### **EFFECT ANALYSIS**

#### **3.1 MONETARY REWARDS: PRICE EFFECT AND CROWDING-OUT**

##### **EFFECT COMPARISON**

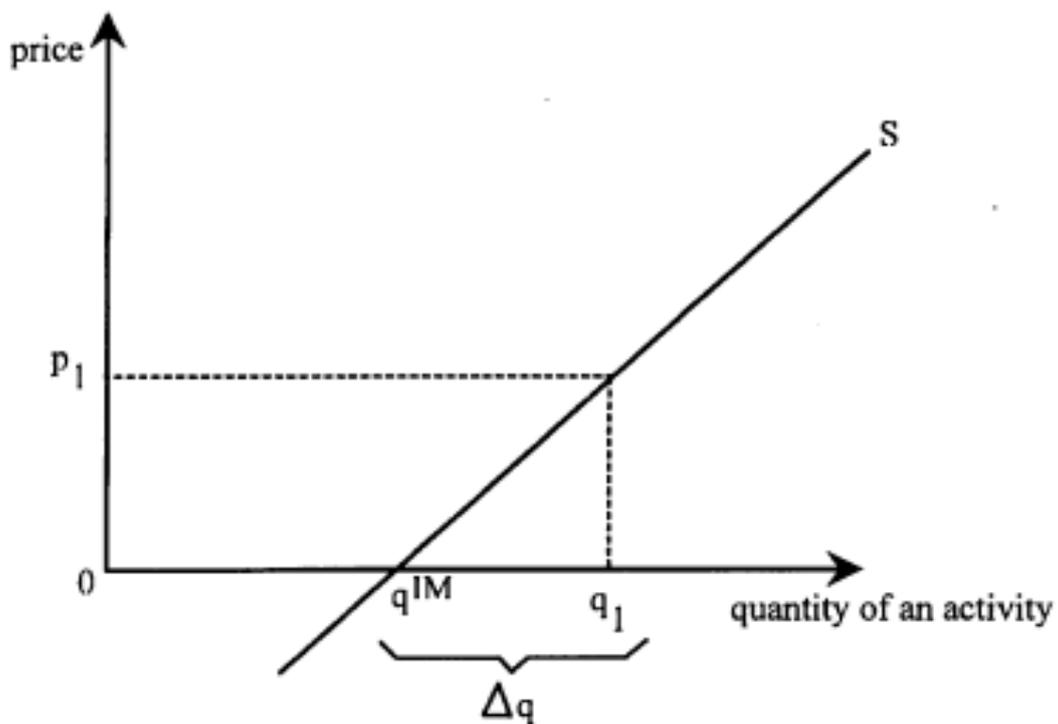
In the previous chapter has been analysed the effect of intrinsic motivation and pro-social behaviors on the attitude of workers, students and experiment participants. The introduction of monetary incentives or rewards can affect people's reaction toward actions driven by intrinsic motivation. Bruno (2011) identifies two ways in which the introduction of pecuniary incentives affect the costumer perception regarding an action previously driven by an intrinsically motivated behavior. The first effect is the relative price effect. In this situation the agent, increase the supply of effort in the activity by lowering the opportunity cost of doing it. The second effect, referred as crowding-out effect, imply a reduction in the willingness of conducting an intrinsically motivated activity once monetary rewards are introduced.

Frey (1997) clarifies some differences between the relative price effect and the crowding out effect. The relative price effect states that an higher price induces an increases in supply. Price and quantity are positively related. The crowding-out effect predicts an exactly opposed response: a higher price induces a decrease in

supply. Frey provides two examples to clarify. The first regards a boy willing to mow the lawn of the family home free. Whether the father would offer him, a compensation when doing that action, according to the crowding-out effect, the boy would lose his intrinsic motivation to cut the lawn doing it just because he is paid accordingly. The second example provided by Frey, consider as impolite offer an adequate sum of money, after having been invited to dinner at your friend's house. Probably nobody would pay after having had dinner at a friend's house knowing that it could lead to the end of the relationship. By paying, the relationship based on goodwill is transformed. Whether the relationship survives, it becomes a commercial one. The two examples indicate that the price effect is not valid under all conditions and circumstances and that the relationship between a monetary reward and supply must be analysed in a wider perspective. "External, and in particular monetary incentives do not mechanically induce human beings to act in the way desired because they crowd-out intrinsic motivation under identifiable conditions." (B. Frey, *"From the Price to the Crowding Effect"*, 1997, Swiss Journal of Economics and Statistics, Vol. 133 pp. 325). As seen in the first chapter of this dissertation an agent is intrinsically motivated to perform an activity when do not receives apparent rewards except the activity itself. Consequently, an external intervention in the form of a monetary reward reduces individuals' intrinsic motivations.

Frey in his survey compares what happens to the supply of an activity in the situation of a relative price effect or in a situation of motivation crowding-out. Considering a positively inclined supply function for an activity (S), at a price equal to zero the individual supply the quantity  $q^{IM}$  meaning the quantity able to produce/furnish through his/her intrinsic motivation. The Price Effect theory predicts that if the price rise (from 0 to  $P_1$ ) the supply rise from  $q^{IM}$  to  $q_1$  moving along the supply curve.

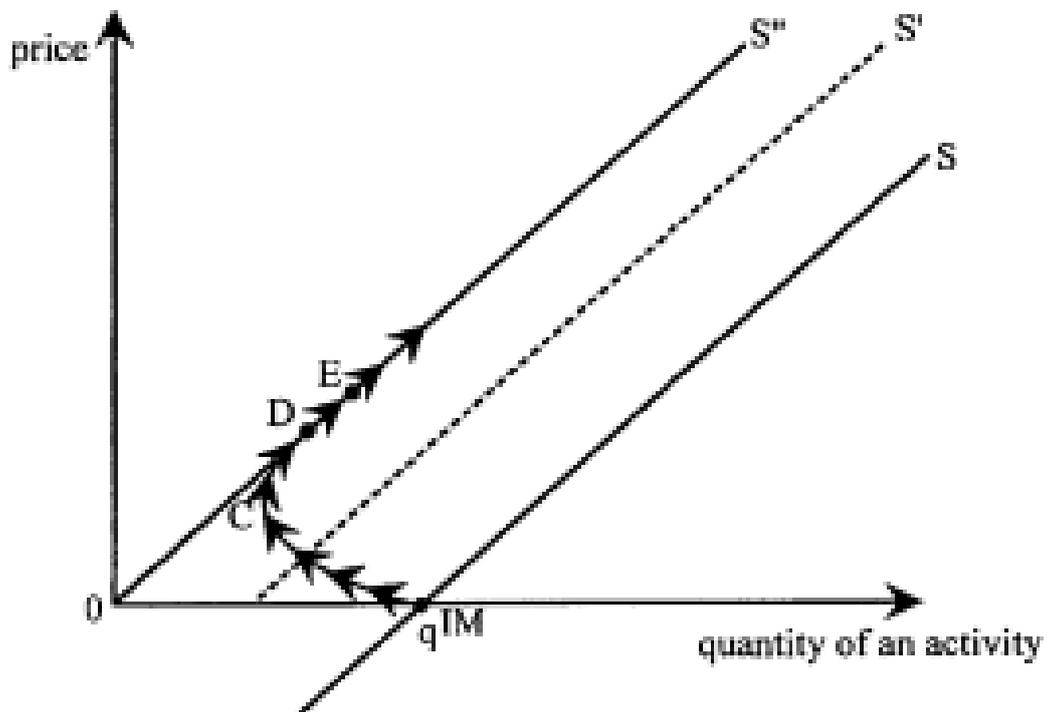
**Graph 3.1: Conventional Supply Theory**



Source: B. Frey, "From the Price to the Crowding Effect" Swiss Journal of Economics and Statistics, Vol 133, pp. 325-350, 1997

The extrinsically induced supply increase  $\Delta q$  is additive to the intrinsically supplied quantity  $q^{IM}$ , thus  $q_1 = q^{IM} + \Delta q$ . In contrast, the crowding-out effect induces a shift in the supply curve to the left.

**Graph 3.2: Supply including Crowding-out Effect**



Source: B. Frey, "From the Price to the Crowding Effect" Swiss Journal of Economics and Statistics, Vol 133, pp. 325-350, 1997

With a positive price offered the supply curve moves to the left (from S to S') until intrinsic motivation is completely crowded out at S''. Specifically, each supply curve is associated with a given stock of capital of intrinsic motivation. Once this

capital stock is exhausted, or at least constant, supply moves along  $S''$ . In this situation, only the price effect exists. The response of the supply curve is different with respect to conventional economic theories. At first, the crowding-out effect prevail over the price effect, and supply falls. This means that the agent reduce the extent of the activity in question. Starting from point C, the Price Effect dominates. When point D is reached, the quantity supplied exceed the amount previously intrinsically supplied. At point D in  $S''$  the stock of intrinsic capital is constant so that price effect exclusively determines supply behavior. Crowding-out is not an alternative to conventional economics theories but rather an extension of them.

External interventions in the form of monetary reward, according to Frey, affects also the nature and not just the quantity of the intrinsic motivated activities supply. Quality tends to be substituted by quantity. External rewards have been found to decrease artistic and verbal creativity in laboratory experiment. Important to notice that these results only refer to how intrinsic motivations are affected or not, excluding the effect of monetary incentives on performance. Referencing again to the example of the dinner at friend's house, the introduction of a monetary intervention transform the nature of the relationship, destroying the existing commodity. Romantic love is a valid example as well. It cannot be bought. If an attempt is made to buy it the relationship is no more based on unselfish love. The same is true for trust, admiration or friendliness, which change their intrinsic nature

when they are bought. These kind of issues related to the transforming effect of money are referred to as *Commercialization Effect*.

Crowding-out incorporation into economics shows that it certainly does not replace the Price Effect but that it revises it. Three crucial aspects should be taken into account when considering crowding-out effect:

1. The crowding-out effect works in the opposite direction to the price effect. The net effect depends on their relative size. When crowding-out is minor, the qualitative effects predicted by conventional economics hold. If conversely, the crowding-out is robust, the price effect may be dominated.
2. Crowding-out effect depend on particular conditions. They do not always take place, and can sometimes be ignored. In particular, when economic relationships are nonconcrete and when personal contacts are not relevant, as is the case for the model of a perfectly competitive market, there is no crowding effect.
3. Crowding-out effects are due to people's perceptions of being controlled by external interventions. The resulting shift in the locus of control from inside to outside the person, tends to weaken intrinsic motivation. External interventions can come from a different sources, including government. Government interventions, however, need not be connected with a feeling of being controlled. There are certainly programmes that have the opposite

effect, in which morality is crowded-in, and civic virtue, tax morale and other manifestations of intrinsic motivation are strengthened

### **3.2 CROWDING-OUT EFFECT**

According to Frey and Jegen (2000) the idea that rewards, particularly of monetary nature may crowd out intrinsic motivation derives from two different literature in social sciences: Titmuss' (1970) *The Gift Relationship*, which was unable to come up with empirical evidences on crowding out, and a second literature whose derive from social psychology. Over the last decade many social scientists, including economists, have accepted the theoretical possibility that motivations may be negatively affected when a previously non-monetary relationship is transformed into a monetary one. Crowding-out effect suggests that there are relevant circumstances in which is not recommended the use of price mechanism to elicit a higher supply of effort or donations but instead the pushing on intrinsic motivation based incentives.

As seen before monetary incentives which crowding-out motivation of undertaking an activity may be considered an anomaly because it predicts the exactly reverse reaction with respect to the relative price effect on which much of economics is grounded. Crowding theory require a methodical interaction between extrinsic and intrinsic motivation while economic theory consider mainly just extrinsic

motivations. Every intervention, both positive rewards and negative sanctions, coming from outside the agent may affect his/her intrinsic motivations crowding-out, crowding-in or leaving them unaffected.

Frey and Jegen give a demonstration of the impact of extrinsic intervention upon behavior in a principal-agent relationship. The principal uses rewards and commands in order to raise the performance (P) of the agent. The agent could be an employee or a worker but these concepts can be applied on everyone who is given a task to perform. The agent (A) performs by considering the benefits (B) and the costs (C) of his/her actions. Both increase in performance such that  $\delta B/\delta P \equiv B_P > 0$  and  $\delta C/\delta P \equiv C_P > 0$ . Higher performance has diminishing marginal returns and is related with increasing marginal cost. Benefits and cost are also conditioned by the principal's external intervention (E):

$$B = B(P,E);$$

$$C = C(P,E);$$

A rational agent chooses the level of performance  $P^*$  that maximizes net benefits given by  $B-C$ , which yields the first order condition:

$$B_P = C_P$$

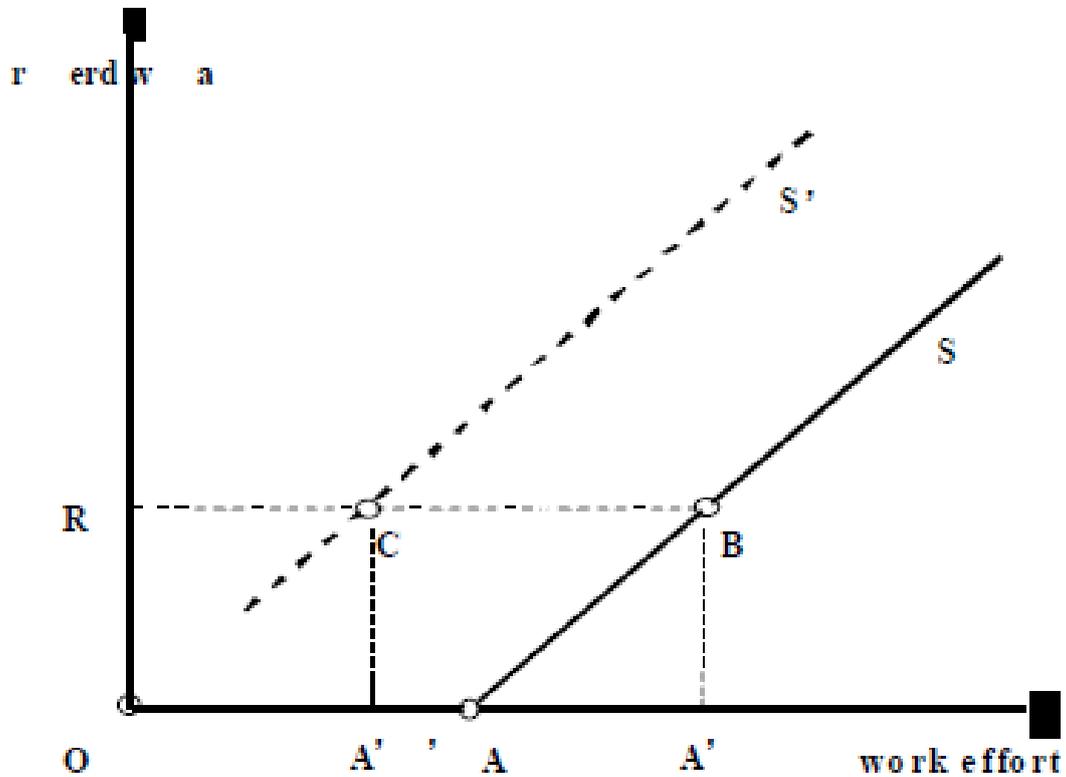
Frey and Jegen distinguish three cases:

1. Following the standard economic principal agent theory, external interventions should raise performance by imposing an higher marginal

cost on shirking or by lowering the marginal cost of performing. This is the relative price effect of external intervention. In this case, the crowding-out effect is ignored, a change in external intervention does not affect the marginal benefit of performing. Intrinsic motivation are taken to be constant or absent. Therefore, external intervention raises performance. The same outcome holds if external intervention raises intrinsic motivation. In case the marginal benefit from performing is raised and further strengthened by crowding-in effect. In this case, the relative price effect works in the same direction as the crowding effect. External incentives raise agents' motivation to perform, and at the same time intrinsic motivation to perform raise as well.

2. On the contrary, when an external intervention undermines intrinsic motivations and thus affects negatively the marginal benefit from performing of the agent, while the disciplining effect doesn't work. In this particular situation, robust external intervention reduces the individual's performance level.
3. Generally both relative price effect and the crowding-out effect are active. The external intervention has two opposite effects on individual's performance depending on the relative size of the two countervailing effects.

**Graph 3.3: Net-outcome of the Price and Crowding Effect**



Source: B. Frey, R. Jegen, "Motivation Crowding Theory: A Survey of Empirical Evidence" CESifo Working Paper Series No. 245, 2000

The interaction between crowding-out effect and price effect can be noticed from the image above. *S* is the traditional supply curve based on the relative price effect, raising the external reward for work effort from *O* to *R*, work effort increase from *A* to *A'*. The crowding-out effect induces, as seen in the previous paragraph, the supply curve to shift leftward to *S'*. In this situation raising the reward from *O* to *R* leads to point *C*, instead of *B*, dominating the price effect reducing the work effort

from A to A'''. Once intrinsic motivation has been crowded out completely, the normal supply curve takes over again. Raising the reward increase work effort moving along S'.

The effects of external reward on intrinsic motivation are attributed to impaired self-determination (when individuals perceive an external intervention to reduce their self-determination, they substitute intrinsic motivation by extrinsic control) and impaired self-esteem (whether an intervention from outside carries the notion that the actor's motivation is not acknowledged, his or her intrinsic motivation is effectively rejected). These psychological processes, which have been analysed in the first chapter of this dissertation, allow Frey and Jegen to derive the psychological conditions under which crowding-out effects appears. External interventions crowd-out intrinsic motivation if the individuals affected perceive them to be controlling. In that case, both self-determination and self-esteem suffer, and the individuals react by reducing their intrinsic motivation in the activity controlled. External interventions crowd-in intrinsic motivation if the individuals perceive it as supportive. In that case, self-esteem is boosted, and individuals feel that they are given more autonomy to act, thus enlarging self-determination.

According to Frey (1997) the crowding-out effect is more pronounced:

1. The more personal the relationship is
2. The larger are the agent's participation possibilities
3. The less individual differences in intrinsic motivation are acknowledge

#### 4. The more the external intervention is specific to certain performance

Crowding effects are relevant in many different areas of individual behaviors in the economy but the scepticism about the empirical relevance of it has been a major reason for not pursuing the analysis any further. Nevertheless, Frey and Jegen (2000) provide some empirical evidences of the crowding-out effect. An ad hoc example is the one of the children who is paid for mowing the family lawn. Once they expect to receive money for that task, they are only willing to do it again if they indeed receive a monetary compensation. Other evidences show that the reward could be not just monetary. If a symbolic reward is introduced, the agent could lost all the interest regarding the activity in order to receive the award. The crowding effect may also work in the opposite way. This crowding-in effect is shown in the example of a patient who have difficulties to regularly take the hypertension medication. The doctor's frequent admonishing or reminders of possible consequences had no effect. Despite ending up in the emergency room a couple of times, the patient only achieved to alter his/her behavior when a new doctor, instead of pressuring to take the medication, asked to what time of the day she considered best to take the pills. Thereby reinforced the intrinsic motivation to follow the prescription. A large number of laboratory experiments able to demonstrate the crowding-out effect has been conducted. It holds in particular for monetary compensations, which are perceived to be controlling by the experimental subjects and therefore tend to crowd out intrinsic motivation. The crowding-out

effect is stronger with monetary than with symbolic rewards. It is also larger with expected than with unexpected rewards.

Frey and Jegen, explain how pecuniary fines can crowd-out intrinsic motivation, furnishing the example of a day-care centre with the problem of parents arriving late to pick up their children. This situation forced the teachers to stay after the official closing time. In response, the teachers thought to introduce a fine to the latecomer parents. After the introduction of the fine, the number of the late-coming parents considerably increased. The result is consistent with the crowding out effect since the introduction of the fine transformed the relationship between parents and teachers from a non-monetary to a monetary relationship. As a result, the parent intrinsic motivation to keep to the time schedules was reduced or crowded out. The perception of the parents, after the introduction of the fine, is that they are paid for the inconvenient of having to stay longer.

An econometric test of crowding theory refers to real life issue of finding a site for locally unwanted project. This is referred to as “Not in my backyard” (NIMBY) problem. For many different projects a wide consensus exist that they are worth being undertaken but no community is prepared to tolerate their vicinity. The hypothesis that external incentives crowd-out civic duty or intrinsic motivation and therefore the willingness to accept the locally undesired project is tested by analysing the reaction to monetary compensation offered. The example reported by Frey and Jegen examine the response of a Swiss community to a governmental

proposal regarding their willingness to accept the construction of a nuclear waste repository on the ground of their community. The community's level of acceptance drops from the 50% in a situation without any compensations to the 24,6% when a monetary compensation is offered. About one quarter of the respondents, seem to reject the facility simply because financial compensation is attached to it.

According to Frey and Jegen, crowding theory can be applied to how constitutional and other legal rules affect the individual citizens. Civic virtue, or social norms, is reinforced if the public laws convey the notion that citizens are trusted. Such trust is reflected by the possibility of having freedom to act on their own with respect to economic affairs and take part to political decisions. On the other way round, a constitution, which implies a fundamental distrust of its citizens and seeks to discipline them tends to crowd out civic virtue and undermines the support which citizens are prepared to exert. The dissatisfied citizens with the political system respond by breaking the constitution and its laws whenever they expect to be able to do it.

Frey (1997) sustains that the Crowding-Out effect may spread to further areas, even into those where the external intervention has not been implemented. If intrinsic motivation is crowded out in areas where it is a major behavioural incentive, the whole outcome of an external intervention tends to be even stronger. There may be an indirect "Motivational Spill-Over Effect" which has to be added to the direct crowding-out effect.

### **3.3 CROWDING OUT AND EXCHANGE VALUE**

Under normal conditions, an individual experience an internal or intrinsic reward when they engage in pro-social activities such as picking up dropped objects or sorting papers. However, if someone offers a reward in return for such action this reduces or eliminates the internal reward.

Schnedler and Vanberg (2014), offer another possible explanation of the intrinsic motivation crowding out. This kind of theory sustains that pro-social activities are used as a signal in order to create or maintain a positive self-image. If paid, these activities may lose their signalling value. According to Schnedler and Vanberg a monetary reward, establish a “market frame” inducing a “market mentality” that could lead to crowding out effects. The “market frame” triggers certain beliefs about the rules governing an interaction. Particularly, the individual consideration about the possibility that he or she might be paid for an activity. Schnedler and Vanberg, consider an individual who bestows intrinsic value to the undertaking of certain activities, such as helping an adult. In absence of other considerations, the individual is motivated to pursue in the activity per se, and would do so voluntarily. If this activity becomes the object of economic transactions, the individual would consider, in addition to its intrinsic value, its exchange value. The agents therefore, would wish to increase this exchange value if possible. In some situations, this aim is reached by trimming on the extent to which the individual engages in the activity.

Even if the agent's intrinsic motivation is unaffected in the situation without extrinsic rewards, he or she may be less willing to perform the action in their presence. Schnedler and Vanberg, describe this strategic response as “playing hard to get” and identify two contexts in which there is an incentive to do so. In the first context, “playing hard to get” causes the exchange value to rise because the activity becomes scarce. In the second context, “playing hard to get” increases the activity exchange value because it suggest that the producer finds the activity unpleasant. The “playing hard to get” effect emerges only if the action undertaken by the intrinsically motivated individual is not possible to be performed by someone else. Schnedler and Vanberg for their dissertation refer to the individual engaging in the activity of interest as “producer” and “consumer” to the person who benefit from it. The exchange value is referred to as “price”. In both contexts, scarcity of the activity and unpleasant activity, two different frames are compared: one in which the activity has a “price” and is tradable and one in which it is not.

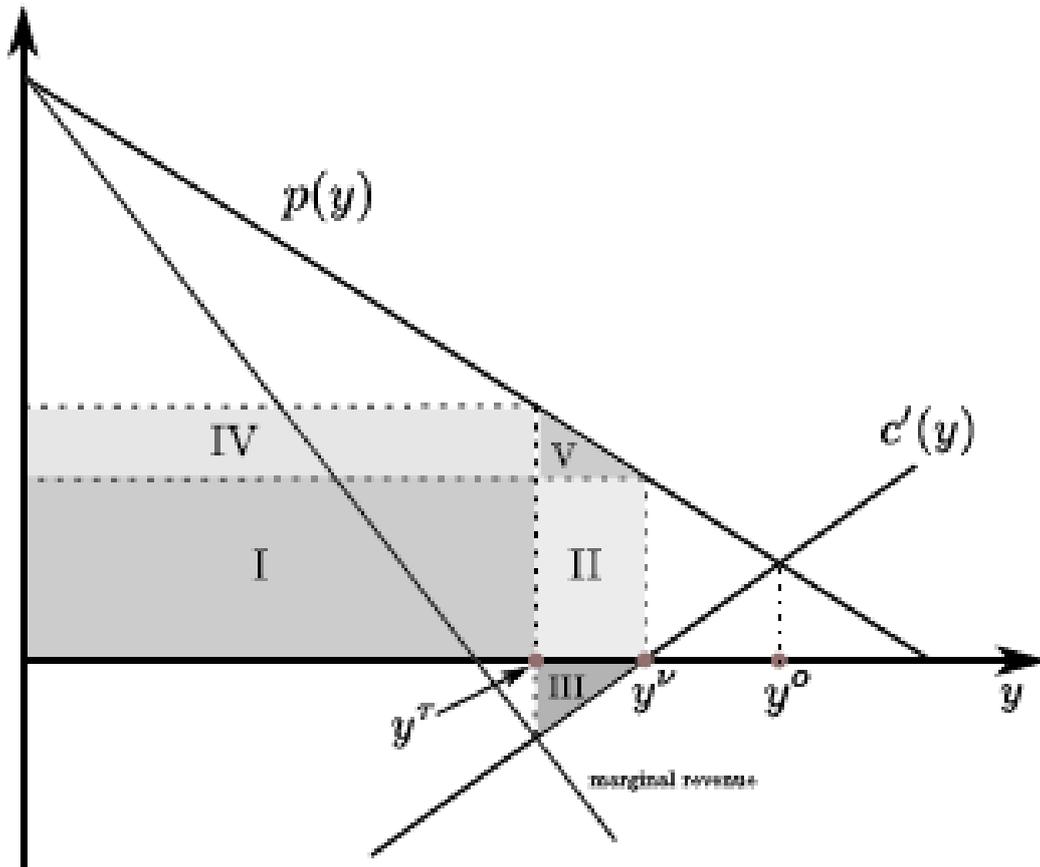
### 3.3.1 Lack of activities

People attach more value to an activity if it becomes scares. In this situation the producer has a sort of market power on the deciding if supply and how much the activity “for free”. Thus, there is an incentive to play “hard to get”. The producer supplies  $y$ , and has a utility given by  $u(r,y,\theta) = r(y) - c_0(y)$  where  $r(y)$  is the extrinsic revenues collected,  $c_0(y)$  the intrinsic cost of the activity depending on the degree

of intrinsic motivation  $\theta$ . Marginal costs are initially negative and increasing, so that total costs are minimized at some positive level of supply  $y^v$ . The consumer has an inverse demand function  $p(y)$ , representing the willingness to pay. The producer's revenues are  $r(y) = p(y) \cdot y$  if  $y$  is tradable and zero otherwise. Marginal revenue,  $r'(y)$  is falling. The producer is aware that the consumer is less willing to reward if the activity is abundant.

In the first frame in which the activity is not tradable helping is not considered as an economic activity. This means that the activity has no economic value and the producer's behavior is driven solely by his/her intrinsic cost function, choosing  $y^v > 0$ . Assuming that the demand is linear and equal to  $p(y) = 1 - y$  and the costs quadratic  $c_\theta(y) = (y - \theta)^2$  the situation is the one of the following picture.

**Graph 3.4: Example of a Monopolist who reduces supply to create scarcity after his service becomes tradable**



Source: W. Schnedler, C. Vanberg, “Playing ‘Hard to Get’: An Economic Rationale for Crowding Out of Intrinsically Motivated Behavior”, University of Heidelberg Discussion Paper Series No. 559, 2014

The producer chooses the desired level of helping  $y^v$  at which point he/she is satisfied because  $c'(y^v) = 0$ . However,  $y^v$  is smaller than the optimal level  $y^0$ , where marginal costs and inverse demand curve intersect and  $c'(y^0) = p(y^0)$ . The reason

is that the producer's activity has a positive externality and that a market for helping might help improving efficiency.

In the second frame, the activity is tradable meaning that is normal to pay for help. The producer consider the effect of his/her behavior on the market price. Being a monopolist, is possible to select the activity level in which marginal costs equals marginal revenues:  $y^\tau = (\theta + 0.5) / 2$  where  $\tau$  represent the supply level if the activity is tradable. The supply is changed due to the tradability

$$y^\tau - y^v = \frac{\theta + 0.5}{2} - \theta = 0.5 (0.5 - \theta)$$

This imply that a sufficiently motivated producer ( $\theta > 0.5$ ) supplies less when the activity is tradable. If the producer would offer  $y^v$  even if the good is tradable he/she would captures some of the consumer surplus, the area I and II in the figure increasing his/her welfare. Reducing supply to  $y^\tau$  instead, the monopolist producer captures more extrinsic rewards, area IV minus area II. This value must exceed the intrinsic value of performing the activity, area III, increasing his/her welfare again. Furthermore, consumers are worse off if the activity is tradable, because of his lower supply and it is no longer free. The loss in welfare is represented by areas I, II, IV and V. Overall society experiences a welfare loss due to the reduced supply represented by area II, III and V. The producer and the consumers would benefit if the producer provide some additional units of the activity free. The additional units just cannot be provided without reducing the exchange value and this is the reason

why the producer do not produce them. Whether the activity is not tradeable, the producer chooses the cost minimizing level  $y^v$  and there are no reasons to increase or decrease the supply. Whether the activity is tradeable, the reason for the producer to supply more or less than  $y^v$  is only driven by changes in revenues. The supply decreases only if marginal revenue is negative at  $y^v$ . Reduction is optimal for the producer when the consumer's demand is inelastic. To sum up, if an activity becomes tradeable, a motivated producer reduces supply whenever demand at the voluntary activity level is inelastic Demand's elasticity depends on the ability of the consumer to find an appropriate alternative to the activity in question. The more difficult it is, the smaller is  $\epsilon$  in absolute value. Hence, crowding out is more likely to occur if a producer is hard to be substituted.

### 3.3.2 Hiding Motivation

The second way, according to Schnedler and Vanberg, in which the reduction in the supply of an activity may increase its exchange value is the manipulation of consumer's perception, making them believe that the producer doesn't regard the activity as intrinsically rewarding. The consumer may conclude that the producer doesn't like doing a determined activity and he/she must be compensated to do so. When the compensation is offered, the producer as a result has an incentive to don't do the activity, even if intrinsically motivated.

Schnedler and Vanberg assume that a producer and a consumer interact for two periods  $t = 1, 2$ . In each period the producer chooses if undertaking or not a task.

The producer's choice is denoted by  $y_t \in [0;1]$ . If the producer perform the task  $y_t = 1$  and the consumer experiences a net gain from having the task completed of  $B \geq 0$ .  $B$  can be taken as a measure of the non-substitutability of the producer's activity. If the producer perform the task, he/she receives an intrinsic payoff denoted by  $\theta$  which is distributed between  $[-1, 1]$ . The producer is motivated and benefit from the task if  $\theta \in (0; 1]$ , or unmotivated if  $\theta \in [-1; 0)$ . The consumer does not know the producer's motivation. The producer derive utility also from extrinsic rewards, denoted  $r_t$ : The producer's period  $t$  utility is:

$$u_t(y_t; r_t) = \theta \cdot y_t + r_t$$

and the consumer's period  $t$  utility is

$$v_t(y_t; r_t) = B \cdot y_t - r_t$$

In the case in which the task is not tradeable an intrinsically motivated producer performs the activity in both periods since  $y^v_1 = y^v_2 = 1$  if  $\theta > 0$ . On the other hand, if  $\theta < 0$  the unmotivated producer won't produce so  $y^v_1 = y^v_2 = 0$ .

If the activity is tradeable the consumer in the second period can offer a price  $p \geq 0$ . Schnedler and Vanberg suggest that a producer who performs the activity in the first period reveals his intrinsic motivation, leading the consumer to offer no reward in the second period. In opposition, a producer who desists from act would appear intrinsically unmotivated, inducing the consumer to offer an extrinsic reward. In such a case even an intrinsically motivated producer may wish to don't undertake

in the activity during the first period playing “hard to get” hiding his/her motivations leading to a payment in the second period. In period 2, producers of type  $\theta > -p$  perform the activity while those of type  $\theta < -p$  do not, where  $p$  is the price offered by the consumer. As well in period 2 consumers offer a reward equal to  $p = \min(B/3; 1)$  if and only if the producer has not performed in the activity in period 1. In period 1, producers of type  $\theta < B/3$  do not perform the activity while those of type  $\theta > B/3$  do it.

When the activity becomes tradable, fewer motivated producers perform the activity in period 1:

$$\text{for } \theta \in (0; B/3) : y^v_1(\theta) = 1 \text{ and } y^r_1(\theta) = 0$$

More unmotivated producers perform the activity in period 2

$$\text{for } \theta \in (-B/3; 0) : y^v_2(\theta) = 0 \text{ and } y^r_2(\theta) = 1$$

Consumers pay for the activity in period 2 if  $\theta \in (-B/3; B/3)$ . Tradability leads to crowding out of intrinsically motivated producers which only occurs if the producers generates  $B > 0$  being the activity difficult to be replaced. The more  $B$  is high the larger the crowding out effect. The negative effect of crowding out concerns motivated producers while unmotivated producers, increase their supply. Regarding the social welfare producers who has a strong aversion toward the activity ( $\theta < B/3$ ) are unaffected. They do not engage in the activity however, it is tradeable or not. Producers with strong intrinsic motivations ( $\theta > B/3$ ) are also unaffected, since they undertake the task in both periods and receive no extrinsic

rewards independently on the fact that the activity is tradable or not. Producers who “weakly dislike” the activity [ $\theta \in (-B/3; 0)$ ] benefit from tradability. They engage in an intrinsically costly activity in period 2, receiving a payment in excess of their costs. Producers with some intrinsic motivation [ $\theta \in (0; B/3)$ ] are the individuals whose period 1 activity is crowded out. These individuals lost the intrinsic pleasure of the activity in period 1. Nevertheless, they do the task because of the value of the second period payment. As a result, some producer gain from tradability more than others but no one get worse off it. For what concerns consumers the expected benefit given by the producer’s activity is unaffected as well the expected sum of period 1 and 2 activity. What has changes is that now consumer has to pay for the activity decreasing the consumer’s utility and the aggregate surplus.

Usual explanations for crowding out effects has been that rewards “spoil the fun” derived from an activity performance. For instance, rewards indicate that the activity is costly, or they destroy its signalling value. In both cases, monetary rewards undermine the agent's original motive for undertaking the task. Schnedler and Vanberg explanation differs from these, since according to them rewards do not affect the original motive. Tradability instead, introduces an additional and competing exchange motive, considering it as a possibly source of crowding out, distinct but not incompatible, with previous theories mentioned above. Reward may crowd out intrinsically motivated behavior even if people derive the same benefit from the activity continuing to liking it. Extrinsic reward induce agents to “play

hard to get” in order to improve the exchange value of the activities by making the activity scarce or lead other to offer reward making them believe that is a burden undertaking the activity. In both cases intrinsically motivated individuals refrain from engaging in an enjoyable activity, which would generates benefit for others.

### **3.4 CROWDING OUT AND RELATIVE INCOME**

Torgler, Frey, Schaffner and Schmidt (2008) provide an experiment of crowding out effect of intrinsic motivations due to higher relative income. The academics analysed 26 season of NBA (National Basketball Association) finding empirical evidences of scarcer performance due to relative income advantage. According to the relative crowding-out effect an individual’s intrinsic motivations to perform are weakened when relative income position get better. This increase could be interpreted as a signal that their position compared to others is significant for their employers or that their behaviour is more controlled by their superiors.

Empirical studies of the effects of income differences on individual behavior have been delayed by the lack of data on individual performance and income data. In basketball instead, individual performance is well defined and can be readily observed. Torgler, Frey, Schaffner and Schmidt uses a data set of professional basketball (NBA) over 26 season between 1979 and 2006. A composite index of the player’s performance has been designed. The index is based on the “good

things” that a player can do on the pitch such as points scored (*PTS*), total rebounds (*TREB*), steals (*STL*), blocks (*BLK*), and assists (*AST*) and then subtract the “bad things”, namely turnovers (*TO*), field goals missed (*FGMS*) and free throws missed (*FTMS*). The performance index is then divided by the number of games played (*GP*).

$$PERF_{Basketball} = (PTS + TREB + STL + BLK + AST) - (TO + FGMS + FTMS) / GP$$

The model try to understand whether future pay affects a player’s current performance. It is based on the assumption that player’s current performance is not affected by the amount of money he or she has already been paid but by the future pay. Individuals’ performances are so motivated by what they expect to receive in the future, based on individual perception of future pay. The regression function elaborated for the model takes the following shape:

$$PERFit = \beta_0 + \beta_1 CTRLit + \beta_2 RELADV_i(t+1) + \beta_3 RELDISADV_i(t+1) + \beta_4 ABSALi(t+1) + TEAMDi + TDt + Ii + \varepsilon_{it},$$

*PERFit* is the performance of player *i* at time *t*. *ABSALi(t+1)* is the future salary of a player and *RELADV<sub>i</sub>* (relative income advantage). On the other hand *RELDISADV<sub>i</sub>* (relative income disadvantage). *TEAMDi* represent team dummy variables, meanwhile *TD<sub>t</sub>* consider time dummies to control for possible differences in players’ environment. *Ii* is the individual effect of player *i*, and  $\varepsilon_{it}$  denotes the error term.

The obtained results suggest that relative income position has a negative effect on performance. In contrast, the coefficients for absolute income are statistically significantly positive. Players care about the salary distribution within the team (reference group) and not just about their own salary. The results indicate the tendency of a performance decrease for players having a relative income advantage. This finding is consistent with the relative crowding-out effect. Having a relative income advantage may affect performance in a negative way reducing the intrinsic motivation to perform. Thus, crowding-out effect may also appear at the relative and not just at absolute compensation level.

Although its simplicity using data from professional sports has its limitations. Average salaries paid in professional basketball are higher than in most other occupations. Moreover, the results may not necessarily be transferred to situations in which pay and performance are less visible or less easily measured.

## **CHAPTER 4**

### **MOTIVATIONAL CROWDING-OUT IN ENVIRONMENTAL CHOICES**

#### **4.1 ENVIRONMENTAL MORALE**

Economists and psychologists address the environmental problem using two opposite approaches. Economists, according to Frey and Stutzer (2006), are convinced that humankind has the capacity to overcome the environmental problem if the right incentives are in place. The environmental problem according to some economists lie in the externalities inducing individuals to destroy the environment because such action is free of cost. The solution therefore is to establish property rights ensuring that every user of the service provided pay an appropriate price. The relative price effect ensures that an efficient allocation of resources is achieved. According to Frey and Stutzer a wide range of economists has no doubt that using incentive instrument is far superior to relying on moralistic behavior. On the contrary, most psychologists sustain that to efficiently address environmental problems people must change their way of thinking and adopt “environmental values”. The two approaches take extreme positions; environmental morale is more important than asserted but also an environmental policy that rely solely on price incentives neglects the useful contribution of environmental morale and motivation to overcome the environmental issue.

Frey and Stutzer state that the environmental problem is due to public good or free riding problem that undermine cooperation among individuals. The academics, identify four area in which is possible to cope with this problems only if the population has a determined degree of environmental morale:

1. Areas in which economic incentives cannot be applied at all or would be too costly to deal with cooperation problems. The costs of control are high due to many sources of pollution or due to a large number of individuals causing environmental damages in this situation. Voluntary contribution in this kind of situation is necessary to prevent environmental externalities.
2. Provision of environmental public goods has to be secured by people willing to sanction non-contributors. For its provision, individuals must prefer reciprocal fairness in environmental issues.
3. Controls and punishment are only one way to induce people to observe laws and regulations. One factor that push people to obey to laws is the morally based inclination to act legally when the laws are perceived to be fair or legitimate.
4. Economic instrument regarding environmental policies can be applied only if the inhabitants are prepared to support the public good when voting. A collective decision requires that a majority of voters has an intrinsic

motivation to safeguard the environment and to support politically the environmental policy.

Public goods are things or services from which any agent can benefit independently of his/her own contribution. According to Frey and Stutzer, self-interested individuals do not contribute to the provision or the conservation of a public good. Therefore, everybody has an incentive to hope that other agents provide it. Self-interested agents contribute only to the extent that his/her marginal benefits equal the marginal cost of the public good leading to cooperation problems. This is the outcome of prisoner's dilemma game regarding public goods. Nevertheless, several laboratory experiments contradict it.

Frey and Stutzer identifies four factors that can be distinguished when referring to environmental morale:

1. Pure altruism as a type of pro-social preferences. The agent values an increase in the provision of public good positively because has a private preference for it and additional resources are allocated to a relevant reference agent. Pure altruism is not enough to explain public goods contribution. Indeed people contribute more to a public good if the utility of fellow agents is lower. This means that voluntary contribution is reduced if the government starts to provide subsidies. Impure altruism instead refers to

warm-glow and the situation in which people get positive feeling from contributing itself moved by social image concerns.

2. Social norms and reciprocity. Intended as common belief about how to behave when contributing to a public good. The prescribed behavior is enforced by informal social sanctions; the aim of contributing is social approval or avoidance of disapproval. Reciprocity instead means that an individual respond to an action that is perceived to be kind or fair in a kind manner and vice versa.
3. Internalized norms. Different from social norms because in this case the norms are internalized as well the nature of rewards and sanctions (guilt or reduction of self-respect) as a reaction to individual behavior.
4. Intrinsic motivation intended as the satisfaction derived from undertake the activity itself.

It can be said that environmental morale represent an aggregate of internalized norms and intrinsic motivation. Environmental morale can be influenced by external interventions in the form of commands and controls or induced price changes. As already seen in the past chapter of this dissertation, an external intervention in the form of a reward, may crowd-out agent's pro-social motivations to act. This is due to self-determination reduction; the external intervention is seen as a restriction to act autonomously shifting the locus of control from inside to

outside the individual in question. On the contrary, if the external intervention is perceived to be supporting it leads to crowding-in of intrinsic motivations. The other factor that lead to crowding-out of intrinsic motivation is the reciprocity violation that raise when a task driven by intrinsic motivations is rewarded intrinsically.

To show how crowding-out of intrinsic motivation works with environmental morale Frey and Stutzer refers to a model of crowding-out elaborated by Frey and Jegen in 2000 already seen in the past chapter

External interventions may have an indirect effect on intrinsic motivation. The crowding out effect may spread to further areas, even into those where the external intervention has not been applied. This “motivational spill-over effect” caused by monetary incentives may lead people to protect the environment less in areas where no external incentives exist. This undesired spill-over effect is not only possible with monetary incentives but also with rules and regulations.

Individuals as consumers as well as government and private organizations have a great role in the preservation and protection of the environment. The crowding-out effect can only take place if individuals have a substantial amount of environmental morale before the external intervention takes place. Frey and Stutzer formulate several hypothesis on the expected effects of various environmental policies.

1. An environmental policy via controls and commands undermines environmental morale. In this situation the locus of control shifts from citizens to governments reducing self-determination. Environmental morale is perceived as superfluous. On the other hand the use of legal system has an expressive function. Citizens are informed about the expected environmental behavior reinforcing existing environmental morale.
2. Tradable emission rights tend to crowd-out environmental morale. This kind of policy imply that the emitters are licensed (have emission rights) to pollute until a fixed quantity. Generally, this instrument has been applied to firm but it can also be used for pollution caused by private households. The idea underneath is that the property rights to nature belong to the society as a whole, and are administered by governments. The use of nature is not free of charge but a price has to be paid. This imply a change in the relative prices leading to changes in behaviors based on extrinsic motivations. This kind of trade encourage a cynical attitude based on the notion that is acceptable to transgress, provided that you pay for it. In this way the sense of punishment is partly lost because to the polluters has been conferred a “license to pollute”. These are the reasons why the use of tradable emission rights is expected to lead to a strong crowding-out of environmental morale. Relative price and crowding-out effect work in opposite directions. Emissions rights tend to reduce pollution because they make violations

costly but at the same time, this process tends to destroy the intrinsic motivation to safeguard the environment. This mechanism works in the same way as the example seen in the previous chapter of fining parents who pick up late their children from school in which the introduction of a monetary fine transform the relationship from non-monetary into a monetary one.

3. Environmental taxes tend to crowd-out environmental morale. Environmental taxes fix the cost of polluting by government decree. Differently from the emission rights this instrument imposes charges on consumers and firms that damage nature. The mechanism for calculating the price differs but the change in behavior is identical. Charging for the use of the environment makes clear that an activity is undesired and that is better not undertaking it. Crowding-out is expected because the intervention undermine self-determination, shifting the locus of control from consumers to government. Citizens at this point feel to not be any more responsible for protecting nature. Nevertheless, environmental taxes influence less environmental morale with respect to tradable emission rights according to Frey and Stutzer. In this situation, the magnitude of price effect is the same as tradable emission rights but the crowding-out effect is less marked.
4. “Low” or “high” environmental tax rates are more effective than “intermediate” tax rates. An environmental tax that is low works because

have a clear expressive function that support environmental morale. Consumers do not feel they are strongly controlled so there is small crowding-out effect that can become crowding-in due to the expressive aspects of the tax. High tax rates work because a strong relative price is introduced. Pollute is very costly. This effect is likely to dominate the crowding-out effect of taxation especially when environmental morale is low. On the other hand, an intermediate environmental tax induces unwanted effects. Environmental morale is crowded-out as self-determination is undermined but the tax rate is insufficient to induce much reduction in pollution due to extrinsic motivation.

5. An environmental policy based only on intrinsic motivation would be misguided and ineffective. If the outside measures emphasize own responsibility self-determination is strengthened and the crowding-in effect may extend to other areas and not only to the one addressed by the intervention. To facilitate the design of this kind of policy environmental morale remember that environmental morale can only be evoked and targeted to reach a specific goal if the contribution expected by the consumer are easy to comprehend and correspond to common sense. Environmental morale may be unreliable and unsustainable. It may drop when consumers realize that other person take advantage of environmentally responsible behavior.

6. Environmental morale is supported and raised by the expressive function of legal regulations. This kind of regulation differ from control and command type interventions. Punishments for non-observers is sometimes not even mentioned or plays a small role. The main function of the law is to emphasize a certain direction and express it officially.
7. Government subsidies have an ambiguous effect on environmental morale. From a certain point of view, environmental morale can be supported by governmental subsidies. For instance if subsidies for activities that reduce pollution serve an expressive function. The subsidies in this case indicates what is the desirable behavior. Price and crowding-out effect work in the same direction. On the other hand, subsidies are often given independently to the contribution given. If a subsidy change the relative price it could provide an incentive to increase pollution before their introduction so that the recipients can benefit even more from the subsidy. Government subsidies are expected to undermine environmental morale if are perceived as bribes. This type of problems are known as NIMBY problems that have been analysed in the previous chapter, compensations alter the perceived nature of siting procedure.

Environmental morale and motivation affect agents' behavior as potential polluters, users of common resources, consumers of environmental friendly products, workers, investors, environmental activists, donors or volunteers of environmental

organization, citizens monitoring and sanctioning other polluters. Environmental morale is often associated with pro-environmental attitudes or preferences that increase the demand for a clean environment. Furthermore, environmental morale helps to overwhelm the free rider problem regarding the provision of a clean environment. Pro-social motivated people voluntarily contribute to public environmental goods, at least if others contribute too, and are willing to bear costs to punish fellow citizens who do not cooperate. Generally, environmental morale and motivation are necessary to overcome the cooperation problems in environmental realm. Environmental morale must be taken into account during the institutional policy design and not consider it just as an individual preference. An effective environmental policy must sustain and strength environmental morale rather than made it superfluous and crowd-it-out.

#### **4.2 EMPIRICAL EVIDENCES OF CROWDING-OUT EFFECT IN CHOICES CONCERNING THE ENVIRONMENT**

According to Goeschl and Perino (2009) the choice of the proper regulatory instrument to align private actions with public interest in the presence of externalities is one of the most debated themes among public economists. The aim of the academics is to analyse how different kind of policies influence individuals' pro-social motivation, specifically the willingness of economic agents to align their private actions with public interests voluntarily. The first instrument taken into

account is the so-called “quantity” or “command-and-control” instruments that specify actions in terms of outcomes, setting technical prescriptions and limits on activity levels for instance. The other group of instruments analysed include the so-called “price” or “economic” instruments that specify incentives. The most frequent form of this kind of instrument are tax instruments. The paper is based on the conjecture that in the presence of pre-existing private contributions above the non-cooperative level, introducing price and quantity instruments to increase contributions will have opposite effects on motivation. Theoretically, price incentives should lead to a crowding-out of motivation while quantity instruments behave neutrally or even crowd-in motivation. Furthermore crowding-out effects are assumed to persist after the incentives are removed.

In the experiment developed by Goeschl and Perino, subjects face a decision between private money payoffs and contributions to a public good, which mitigate climate change. The way in which the experiment is developed allow the comparison between the motivational crowding-out effects associated with the two different kind of policy, taxes and emission standards, and how them affect individual’s willingness to contribute to the environmental public good.

#### 4.2.1 The Goeschl and Perino experiment

Participants gathered in four groups identified by different treatments take a sequence of three anonymous and independent choice experiment (rounds) that involve a simple trade-off between participation to a global public good in the form

of greenhouse-gas emission reductions and collecting personal payoffs in the form of personal payments. A total of 172 students participated over two sessions, each lasting about one hour. Both sessions included 3 choice experiment (rounds) and all the four different treatments. Session 1 was composed of 43 subjects recruited by an open call to students of different departments. Session 2 was composed of 129 subjects recruited from a single lecture. Anonymity is announced in advance and imply that with respect to the other experimental subjects there are no interactions (no communication or sharing of information) at any stage of the experiment. A random ID is assigned to individuals when entering the room which also convey the place where to sit. Independence of choice means that there are no relationship among subjects in actions or payoffs. Subjects knows that might be more than one round but not how many. This factor with the anonymity and independence of choice imply that subjects could not reasonably believe that the experiment is anything else but a sequence of choice experiments. The purpose of the choice experiment is to reveal agents' willingness to pay for an environmental public good in each of the three rounds by observing individual choices among alternatives that differ in the relative price of public good and the individual private gains. The public good used has to ensure that the trade-off between the public good and the private gain is real while minimizing the strategic interactions between subjects. The choice of a public good such as greenhouse abatement eliminates any strategic interaction due to the huge number of people involved in its provision. In

each round, subjects choose a production level that determines both their private payoff and the contribution to the public good. Two sheets are given for each round: one instructions sheet and one answer sheet in which participants enter their choice of production level into a matrix showing for each production level the associated payoff, contribution to the public good and CO<sub>2</sub> abated. The four treatments (or groups) take the identical choice experiment in every round except for round 2. In this round two groups face regulatory interventions, one group is subject to taxes while the other is subject to restrictions backed by a sanction. The other two groups serve as control. Differences in behavior are then tested when the external intervention is applied in round 2 and when it is removed in round 3.

#### 4.2.2 Treatments

The basic choice experiment (BASELINE) is the baseline experiment and it is used for all four treatments in round 1, all four treatments in round 3 and one treatment in round 2. The contribution toward the public good is associated with carbon dioxide (CO<sub>2</sub>) retirement based on real data from the European Union Emission Trading System (EU ETS). The permit price at the time of the experiment was 24.50€ per ton of carbon dioxide emission. As is possible to notice from the following table production level 5 generates the maximum of the sum of private payoff and public good contribution, implying that some amount of production may be socially desirable.

**Table 4.1: Payoffs and climate contributions**

1	2	3	4
Production Level	Your Payoff	Climate Contribution	CO <sub>2</sub> Abated
0	0.00 EUR	30.00 EUR	1.22 t
1	3.00 EUR	29.50 EUR	1.20 t
2	6.00 EUR	28.50 EUR	1.16 t
3	9.00 EUR	27.00 EUR	1.10 t
4	12.00 EUR	25.00 EUR	1.02 t
5	15.00 EUR	22.50 EUR	0.92 t
6	18.00 EUR	19.00 EUR	0.78 t
7	21.00 EUR	14.00 EUR	0.57 t
8	24.00 EUR	8.00 EUR	0.33 t
9	27.00 EUR	2.00 EUR	0.08 t
10	27.00 EUR	0.00 EUR	0.00 t

Source: T. Goeschl, G. Perino “*Instrument Choice and Motivation. Evidence from a Climate Change Experiment*”, Centre for Behavioural and Experimental Social Science University of East Anglia, Discussion Paper 09-05, 2009

The other three treatments are variants of the basic choice treatment (BASELINE). The variations only occur in round 2 in which two treatments called TAX and COMMAND & CONTROL (C&C) involve regulatory interventions through the utilization of explicit incentive schemes. A treatment called EXOGENOUS PAYOFF CHANGE (EX) is the control for treatment TAX meanwhile BASELINE

serve as control for COMMAND & CONTROL. During round 2 the explicit interventions applied in TAX and COMMAND & CONTROL change the basic choice experiment faced by participants. In this round subjects are instructed that in order to protect the environment, individual emissions are measured and regulated. In the TAX treatment, a tax level is set for each level of production. Tax revenue is not spent on abating carbon dioxide. The instruction sheet present the amount of tax payable at each production level and the resulting net payoff. The answer sheet contains only the net payoff and is identical to the one in round 1. In the COMMAND & CONTROL treatment, a permitted threshold is permitted until level 6 of production. Above that level the agent must pay a penalty. Fine revenues are not redistributed or spent to reduce CO<sub>2</sub>. The instruction sheet presents the amount of fine payable at each production level and the resulting net payoff. The answer sheet contains only the net payoff and is identical to the one in round 1.

**Table 4.2: Taxes and penalties**

1	2	3
Production Level	Tax	Penalty ( <i>C&amp;C</i> treatment)
0	0.00 EUR	0.00 EUR
1	0.50 EUR	0.00 EUR
2	0.75 EUR	0.00 EUR
3	1.50 EUR	0.00 EUR
4	3.50 EUR	0.00 EUR
5	5.50 EUR	0.00 EUR
6	8.00 EUR	0.00 EUR
7	11.50 EUR	11.50 EUR
8	15.50 EUR	15.50 EUR
9	19.50 EUR	19.50 EUR
10	21.00 EUR	21.00 EUR

Source: T. Goeschl, G. Perino “*Instrument Choice and Motivation. Evidence from a Climate Change Experiment*”, Centre for Behavioural and Experimental Social Science University of East Anglia, Discussion Paper 09-05, 2009

Being the BASELINE treatment the control of C&C treatment for the production range that goes from 7 to 10 some adjustments are introduced in round 2 to make choices comparable. This is because this range undergoes a shift in the relative

prices that results from the introduction of penalties from level of productions higher than the stipulated threshold of 6. The EX treatment simulates the change in relative price resulting from the tax in the TAX treatment. The appropriate control for TAX is a treatment in which subjects face the exact shift in payoffs and relative prices. In the EX treatment this shift is motivated in the instruction sheet not by reference to a tax but appears just as an experimental payoff variation. The answer sheet of TAX and EX is identical so the choice situation is indistinguishable from an economic point of view, what change is the presence or not of an external intervention.

#### 4.2.3 Behavioral predictions

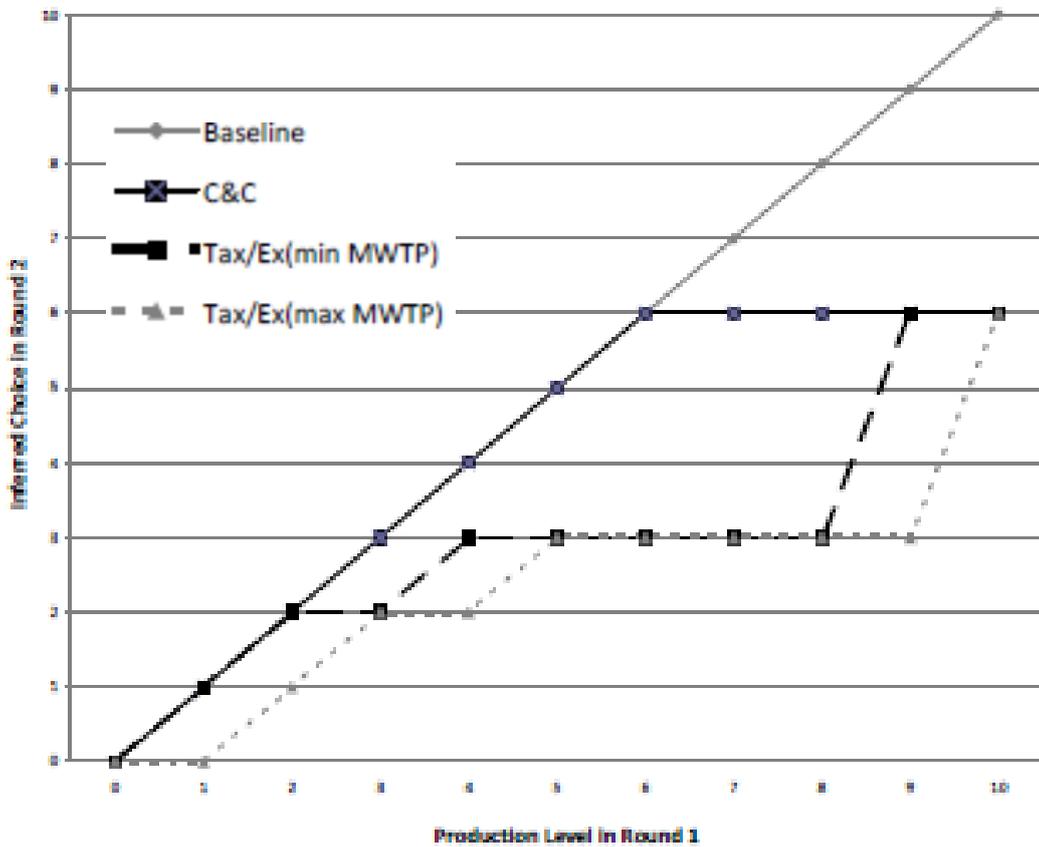
In order to identify motivation crowding-out caused by explicit incentive schemes on behavior in round 2 and 3 Goeschl and Perino develop some predictions regarding agents' behavior during the experiment. Only deviations from the predictions can provide evidence of motivation crowding. Round 3 results are directly compared using this caveat, while results for round 2 are interpreted using differences-in-differences (statistical technique, used in social sciences, which try to mimic an experimental research design using observed data by studying the different effect on a treatment and a control group).

The academics start with differences between rounds that can be explained by conventional theories on crowding out. According to Goeschl and Perino conventional theories are based on interaction between three elements:

1. Subjects' willingness to pay for contribution to climate change abatement.  
Subjects reveal their marginal willingness to pay through their choice in round 1 where they renounce to monetary payoffs in exchange for contributions to emission reduction.
2. Changes in the relative price schedule. With the exception of the BASELINE treatment, all treatments in round 2 alter their relative price of contribution or payoffs with respect to round 1.
3. Stability of preferences. Conventional theories imply that willingness to exchange payoffs for contribution at the margin should not change simply because relative prices have changed. Preferences should therefore be invariant with respect to instruments.

Together these three elements provide the basis for supposing a choice in round 2 that is consistent with a choice in round 1 on the ground of conventional theory. The inference of round 2 behavior relies on the observed approximate marginal willingness to pay (MWTP) of subjects in round 1 and mapping those into round 2. The assumption made is that subjects in the BASELINE treatment tend to reduce their MWTP from round 1 to 2.

**Graph 4.1: Production level in Round 1**



Source: T. Goeschl, G. Perino “*Instrument Choice and Motivation. Evidence from a Climate Change Experiment*”, Centre for Behavioural and Experimental Social Science University of East Anglia, Discussion Paper 09-05, 2009

This figure summarizes how choice in round 2 on the vertical axes are inferred on the basis of the choice in round 1 for each treatment. Four curves are shown. The 45° line is the inferred choice for the BASELINE treatment. In this treatment relative prices remain constant from round 1 to 2 so does the inferred choice. A 45°

line for first round choices represents the C&C treatment in the interval that goes for the levels of production from 0 to 6. Afterward it goes horizontally at a second round choice of 6 for first round choice within 7 to 10. This is because of that for those individual with a production level greater than 6 in round 1, the change in relative prices introduced by the production restriction supported by penalties makes a choice of 6 the most preferred option given their MWTP. The stepwise function instead represents the inferred choice in round 2 in the TAX and EX treatment. Both treatments are comparable under economic criteria and give rise to the same inferred change in choice. Since the relative cost of cash pay-out is greater in round 2, the inferred activity levels are correspondingly reduced. The black dashed line indicates the inferred choice based on the minimum MWTP revealed in round 1 in TAX treatment. The grey dotted line instead represent the maximum MWTP in TAX treatment. To complete the behavioral predictions Goeschl and Perino consider changes between rounds that deviate from conventional theory but are not specific to treatments. These factors, like boredom for example, are common to all treatments and must be rejected.

The main hypotheses, formulated by Goeschl and Perino, regarding deviations of observed choices from predictions in round 2 are the following:

1. The deviation from predicted production level and actual choices in round 2 is the same for an explicit price intervention (TAX) and for an equivalent price shift without an explicit intervention (EX) → the TAX treatment and

its control EX are subject to an identical price shift between round 1 and 2. The shift in price make private payoffs more expensive in terms of contributions to climate change abatement. For both treatments consequently is predicted a reduction in production levels. Given the same variation in relative prices, hypothesis 1 predicts that subjects in both treatments will adjust in the same way to the same change in relative price.

2. The deviation from predicted production levels and actual choices in round 2 is the same for an explicit quantity restriction backed by a pecuniary sanction (COMMAND & CONTROL) and for an unrestricted production (BASELINE) → In round 2 subject in the BASELINE and C&C face equal relative prices until level 6 of production. Starting from level 7 and above relative prices in C&C change due to the penalty imposed in round 2. In the C&C treatment the predicted production levels in round 2 are the same as in round 1 except that all choices above 7 are reduced to 6. In the BASELINE treatments there is no change in relative prices at any production level so in order to ensure comparability between treatments an adjustment procedure, in which all production level above 6 is treated if it would be 6, is applied to the BASELINE treatment. Since relative prices below 7 do not change from round 1 to 2 in either treatment, there are no reason to expect changes in the two treatments from round 1 to 2.

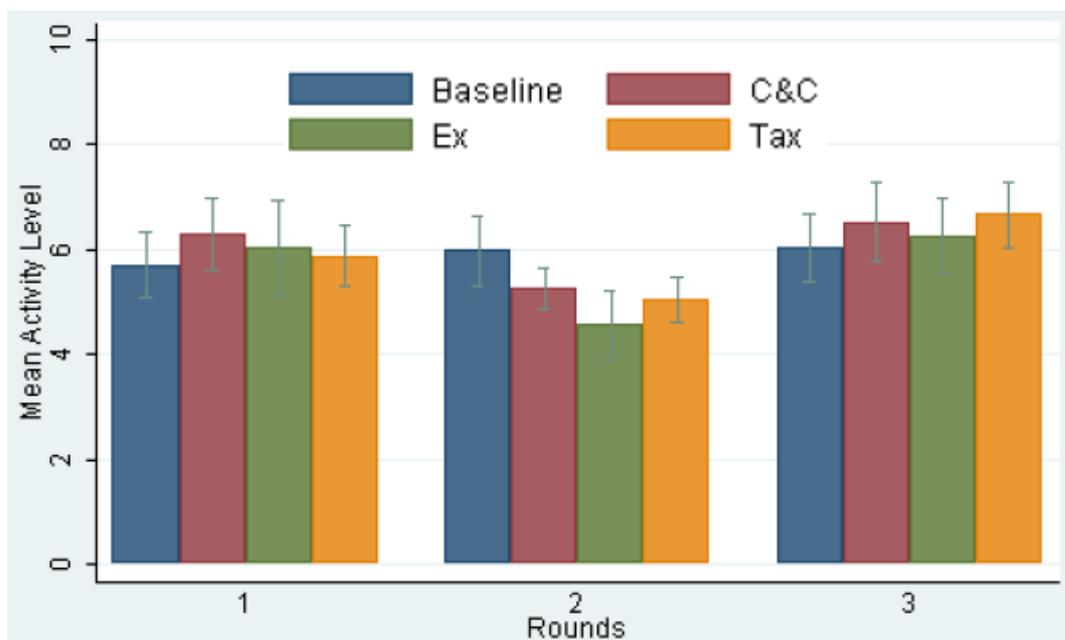
3. The deviation from predicted production levels and actual choices in round 2 is the same for a production restriction backed by a pecuniary sanction (COMMAND & CONTROL) and for an explicit price incentive (TAX) → Both treatments C&C and TAX induce a change in relative price from round 1 to 2 by introducing explicit abatement incentives. The change in relative price is identical over level 7 of production since the penalty and the tax rate involve the same payoff reduction. It would be wrong to conclude that deviations from predicted choices should be indistinguishable between the two treatments since these changes can be driven also by other factors not captured by conventional theory that affect adjustments to changes in relative prices.
4. The change in production levels from round 1 to 3 is identical for all treatments. Round 3 presents the original price schedule of the baseline and consist of the same answer sheet of round 1. Observed production levels in round 1 can be used as prediction of round 3 choices. This hypothesis can hold even if the above hypothesis fail to hold. Changes in preferences can occur only in round 2.

#### 4.2.4 Results

Goeschl and Perino start analysing some basic information regarding the behavior of the four groups in the three rounds.

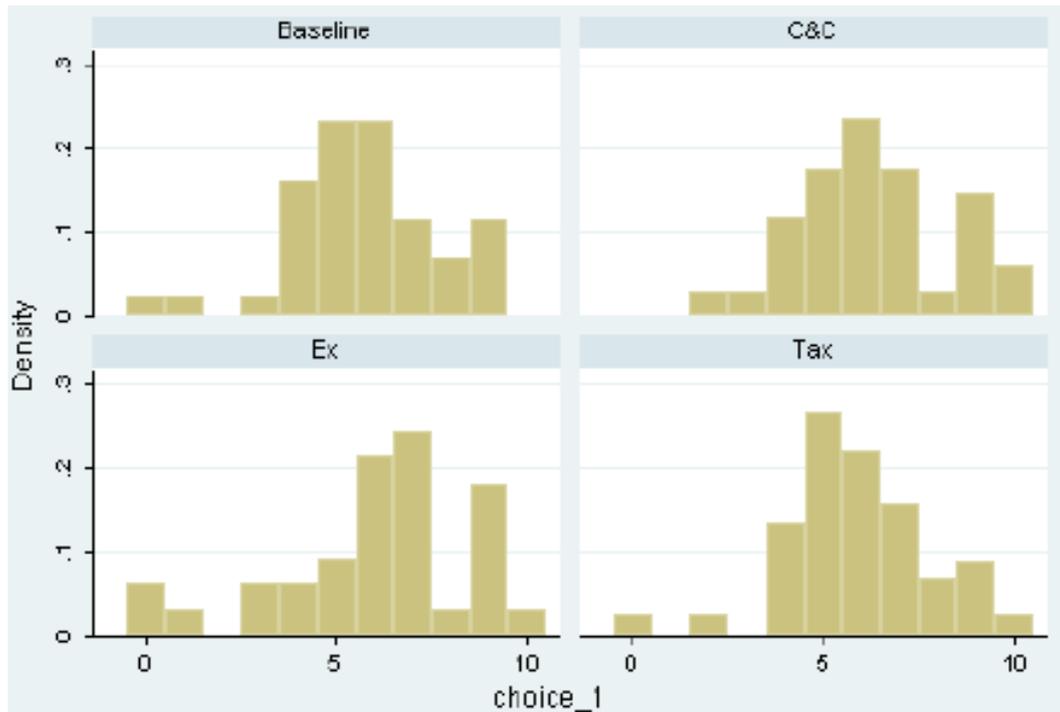
The next figure reports on average the levels production of each group in each round. Round 1 provide information on participants' willingness to pay for environmental purposes before the introduction of explicit incentives schemes. In round 1 choices are dispersed over the entire interval of possible choices with modals between 5 and 7. Given that the average production level are substantially below the pure private payoff maximum of 9. The median production level is 6 in all groups.

**Graph 4.2: Production levels**



Source: T. Goeschl, G. Perino “*Instrument Choice and Motivation. Evidence from a Climate Change Experiment*”, Centre for Behavioural and Experimental Social Science University of East Anglia, Discussion Paper 09-05, 2009

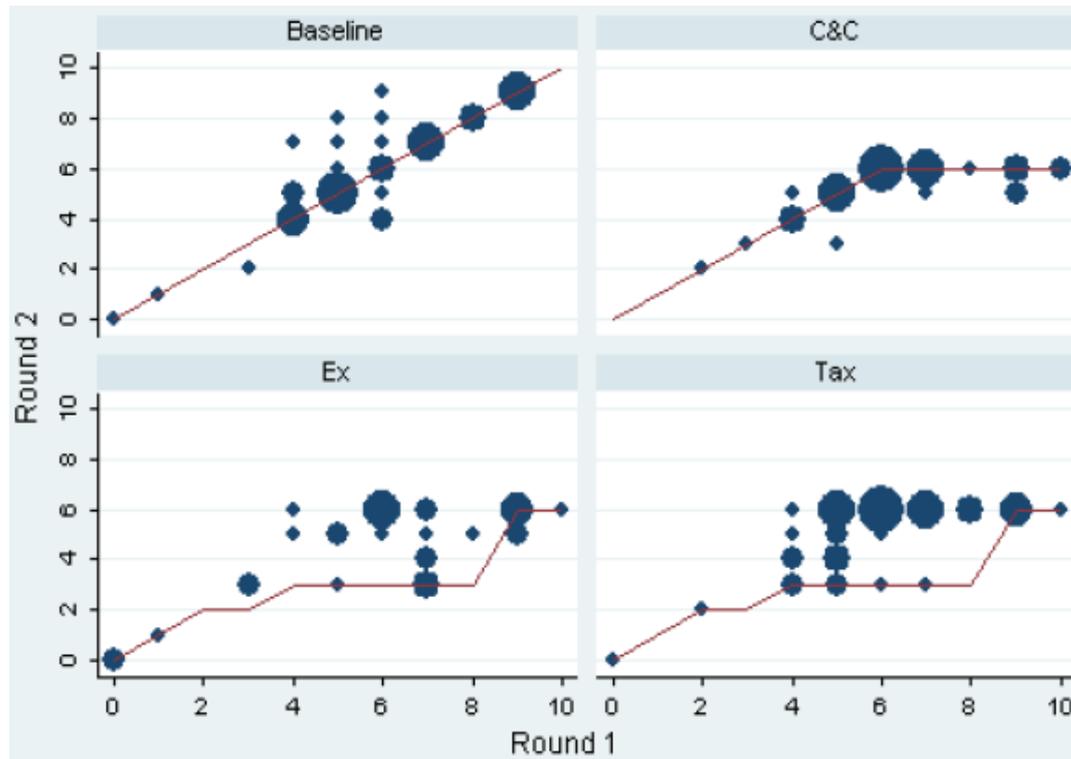
**Graph 4.3: Distribution of production levels in round 1 by treatment**



Source: T. Goeschl, G. Perino “*Instrument Choice and Motivation. Evidence from a Climate Change Experiment*”, Centre for Behavioural and Experimental Social Science University of East Anglia, Discussion Paper 09-05, 2009

Goeschl and Perino for presentational purposes combine statistical test with scatter plots that visualize participants’ choices in different rounds

**Graph 4.4: Scatter plot of Round 1 and 2 choices by treatment. Lines indicate inferred choices**



Source: T. Goeschl, G. Perino “*Instrument Choice and Motivation. Evidence from a Climate Change Experiment*”, Centre for Behavioural and Experimental Social Science University of East Anglia, Discussion Paper 09-05, 2009

The above graphs represent for each treatments inferred and observed choices between round 1 and 2 .The size of the dots represent the frequency of observation and lines represent the inferred choice for each treatments. What emerge is that preferences are approximately stable. In the BASELINE treatment, 29 out of 42

individuals stick to their first round choice. Predictions for C&C is even more accurate because 29 out of 34 subject behave in line with the inferred choices based on revealed MWTP and changes in relative prices. On the other side, in TAX treatment and its control EX the observations do not match exactly the inferred choices in round 2. Only 13 out of 45 in TAX and 12 out of 33 in EX. Subjects initially in the middle range choose on average lower productions levels in round 2 than in other treatments, a result in line with the shift in relative prices.

Hypothesis 1 check for differences in behavior between the TAX and EX treatment in which individuals experience the same change in relative prices in round 2. Participants in the TAX treatment on average choose higher production levels than their EX counterparts. This means that subjects in the TAX treatment reduce their MWTP for CO<sub>2</sub> abatement more than subject in the EX treatment. This provide evidence for crowding-out of pro-social motivation due to an explicit price intervention compared to an equivalent but non-interventive change in relative prices.

Hypothesis 2 assume that in absence of motivation crowding there should be no difference between COMMAND & CONTROL and the adjusted BASELINE treatment. In C&C inferred choice in round 2 are the same to the production levels in round 1 until level 6 of production. The same happens in the adjusted BASELINE

treatments so there are insufficient evidence for the presence of crowding effects induced by an explicit quantity restriction supported by a fine.

Hypothesis 3 must be rejected because evidence show that individuals subject to price regulation exhibit a significant drop in their MWTP which is not the case for those regulated by a quantity restriction. In contrast to quantity restrictions, price regulation is associated with a significant drop in MWTP for abatement of CO<sub>2</sub> emissions.

Hypothesis 4 imply that the crowding-out effects on motivations due to an external intervention should not persist in the short term. The spill over effect of motivational crowding theory is tested to verify if the removal of the external intervention remove any influences on agents' behavior. This means that results obtained in round 1 should be identical to results of round 3 because the participants face the same decisions in both rounds. The only difference between treatment is the regulation experienced by agents during round 2. Experimental results show that there are no differences between round 1 and 3 in the BASELINE and C&C treatments but that in TAX and EX production level increased significantly. Concluding the crowding-out of intrinsic motivation induced by explicit price regulation is short term persistent although intervention is no longer present.

#### 4.2.5 Discussion

What emerge from the Goeschl and Perino experimental results is that explicit price incentive in the form of taxes crowd-out contributions to a global public good persist even when the price incentive is removed. On the contrary, an explicit quantity controls equivalent to the price intervention does not lead to crowding-out. The academics refers to a possible cognitive crowding-out effect limiting the interaction between incentives and motivation to a rational response to a change in the informational context. Cognitive motivation crowding theories demonstrate how the interaction of explicit incentives and informal imperfections can give rise to motivational crowding. Cognitive motivation crowding can be due to a lack of anonymity among participants in the experimental setting or to formal defects in the experiment set up. Cognitive reasons to motivational crowding-out are avoided because of anonymity combined with independence of choice as fundamental key points of the experimental setting. As a control, an exit a questionnaire is given to participants in order to test attitudes regarding emissions trading and other relevant factors that might interact with subject's observed behavior. The only finding in this context is the predictable results that subjects with a stronger environmental orientation did provide more contributions to climate change abatement than those with a low level.

To test for the long-term persistence of crowding-out effects participants of session 2 were invited to participate in a follow-up session one week later where they faced the same payoff matrix as in round 1. The assumption made by Goeschl and Perino implies that the change in production levels from round 1 to 4 is identical for all treatments. Results obtained after round 4 show that average and median production level has increased in all treatments but there are no significant differences in the adjustments from round 1 to round 4 between treatments so there are no long-term effects that show persistence in motivational crowding-out.

To conclude, the other question that Goeschl and Perino ask themselves is what alternative mechanism is likely to be activated by price incentives rather than quantity incentives when talking about motivational crowding-out. The academics identify affective motivation crowding (AMC) as opposed to cognitive motivation crowding (CMC). Behavior based on affect needs an association of positive or negative emotions with an event. For instance, a moral decision in which opposite categories of “good” and “bad” apply. A quantity control instrument leads to two regimes of behavior which fit a dichotomous view of “good” and “bad” attitudes. One regime is for those within the threshold level of 6, so subjects which value the social optimum, and another for those outside. The price instrument conversely has not the same capability to create opposite types of behavior. This kind of instrument penalize every agent who care about environment because it provide an implicit message that no behavior is “good” enough to don’t be penalized.

## CONCLUSIONS

People are driven by emotions and influenced by the environment of which they are part. This statement can be clearly deducted from the opening part of the first chapter of this dissertation. The dualism between economics and psychology in studying human behaviors no longer makes sense currently. The methodologies and the objectives studied by the two subjects are profoundly different. Behavioral Economics try to integrate psychology and economics criticizing the strong rational economic man, inherent in contemporary Neoclassical Economics, arguing that we are humans and not econs. Humans and econs are not comparable. Neoclassical economics is aware of this complexity but it simply looking for something else. Nevertheless the success obtained by Behavioral Economics, according to Obregón it is not able to become a new paradigm in economics simply because it cannot solve the full set of problems that economics need to address. There may be diverse theories explaining the same phenomena in different ways and all these different versions can explain distinct aspects of economic reality in a satisfactory way.

During their studies, economists can use alternatively the terms incentives and motivation, even though they are not the same thing. Motivations is far more complicated and incentives, monetary or not, represent just a part of it. Motivations are strictly related to the concepts of emotions and rationality proper of Behavioral

Economics, so is possible to say that this branch of economics addresses this topic. According to Ryan and Deci (2000), the doing of an activity for its inherent satisfaction rather than for some separable outcomes, define intrinsic motivations. When intrinsically motivated, a person is moved to act for the pleasure or challenge rather than external rewards or pressures. Intrinsic motivation reflects the tendency to seek out novelty and challenges as a natural inclination toward assimilation. Bruno (2012) indicates four goals of human behavior related to intrinsic motivations: pleasure to perform the task, desire to succeed in performing the task, warm-glow and social preferences. Warm-glow and social preferences according to Bénabou and Tirole (2006) represent two opposite sides of pro-social behavior. Pro-social behaviors are voluntary behaviors intended to benefit another motivated by altruism or self-interest. Many subjects display altruistic or reciprocal behaviors but, other regarding preferences, are not the only driver of pro-social behavior. People perform good deeds and refrain from selfish behaviors only because of social pressure and norms that attach honor or shame. What comes out from the Jelle de Boer (2007) study regarding social preferences is that they are a contingent robust phenomenon. However, the Orma experiment analysed by the academic is not sufficient to understand reality as a whole. Orma cooperates in a one-shot game because it is in their heritage. Real life is full of information asymmetries. It is supposed that repeated play should foster empathy and social preferences. On the other side warm-glow actions are driven by the donor's preference of giving per se

or motivated by a desire for status, acclaim or social image concerns. Lacetera and Macis (2008) study on the effect of a symbolic reward associated with the number of voluntary blood donations confirm this phenomenon. Evidences show that an increase in donation frequency is registered when the subjects are close to reach the reward. This means that prestige and social image in certain situation matters more than the activity undertaken. The experimental investigation done by Tonin and Vlassopoulos (2011) on pro-social behavior confirm the warm-glow phenomenon too. Evidence shows a considerable reduction in donations moving from the first decision made to the third one in every treatment analysed. This decline can be attributed to a satiation of warm glow motivation and is not related to purely altruistic motivation. Results are influenced by the fact that the experiment is designed as a random lottery incentive scheme. Thanks to this is possible to observe for each treatment the same response as if the treatment would have been the only one faced by a subject.

The introduction of monetary incentives or rewards can affect people's reaction toward actions driven by intrinsic or pro-social motivation. The introduction of pecuniary incentives affect the perception regarding an action previously driven by an intrinsically motivated behavior in two ways. The first effect is the relative price effect. In this situation the agent, increase the supply of effort in the activity by lowering the opportunity cost of doing it. The second effect, referred as crowding-out effect, imply a reduction in the willingness of conducting an intrinsically

motivated activity once monetary rewards are introduced. The net effect depends on their relative size. When crowding-out is minor, the qualitative effects predicted by conventional economics hold. At first, the crowding-out effect prevails over the price effect, and supply falls. Once intrinsic motivation has been crowded out completely, price effect exclusively determines supply behaviors. This mechanism implies that crowding-out is not an alternative to conventional economics theories but rather an extension of them. In the case of crowding-out effect, the impact of external reward on intrinsic motivation are attributed to impaired self-determination and impaired self-esteem. These psychological processes, which have been analysed in the first chapter of this dissertation, allow Frey and Jegen (2000) to derive the psychological conditions under which crowding-out effects appear. External interventions crowd-out intrinsic motivation if the individuals affected perceive them to be controlling, shifting the locus of control from inside to outside the individual. In that case, both self-determination and self-esteem suffer, and the agents react by reducing their intrinsic motivation in the activity controlled. The crowding-out effect is stronger with monetary than with symbolic rewards. It is also larger with expected than with unexpected rewards. Pecuniary fines can crowd-out intrinsic motivation as well. This mechanism is described by the children day-care example of the third chapter. Schnedler and Vanberg (2014), offer another possible explanation of the intrinsic motivation crowding out. Their theory sustains that pro-social activities are used as a signal in order to create or maintain a positive self-

image. If paid, these activities may lose their signalling value. According to Schnedler and Vanberg a monetary reward induce a “market mentality” that could lead to crowding out effects. If the activity become tradable (meaning that is possible to be paid for it) and the activity in question is scarce or perceived by the recipient as a burden for the producer, it becomes ideal for the producer to offer less than the optimal amount implicit by the economic equilibrium. Usual explanations for crowding out effects has been that rewards alter the original reason why an individual undertake an action. According to Schnedler and Vanberg, rewards do not affect the original motive. Tradability instead, introduces an additional and competing exchange motive, considering it as a possibly source of crowding out, distinct but not incompatible, with previous theories mentioned.

Economist and psychologist have tried to address environmental issues using two completely different approaches. What comes out is that environmental morale is more important than asserted by economists but also that an environmental policy that rely solely on price incentives not effective as well. Environmental morale represent an aggregate of internalized norms and intrinsic motivation. As a consequence, it can be subjected to crowding-out due external interventions in the form of commands or induced price changes. Goeschl and Perino (2009) in their attempt to analyse how different kind of policies influence individuals’ pro-social motivation compare “quantity” and “price” instruments. The results emerged from the experimental investigation are in line with almost every one of their theoretical

prediction. Explicit price incentive in the form of taxes crowd-out contributions to a global public good and this effect persists even when the price incentive is removed. On the contrary, an explicit quantity control equivalent to the price intervention does not lead to crowding-out. The academics identify also affective motivation for crowding-out. Behavior based on affect needs an emotional association with an event. A quantity control instrument leads to two regimes of behavior, “good” or “bad”. The price instrument conversely penalizes every agent because it provides an implicit message that no behavior is “good” enough to not be penalized.

To sum up the aim of this dissertation is to give to the reader some basic knowledge about which branch of economics try to study an extreme ample argument like intrinsic motivation and their functioning as well analyze pro-social motivations, a specific kind of motivation born from the match of two different kind of intrinsic motivations. Investigate motivational crowding-out effect is a major concern providing also an empirical example of its functioning in a context involving choices regarding environmental that can be intended as an example of pro-social motivation.

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