

The London School of Economics and Political Science

*Institutions and Reciprocity in the Employment
Relationship*

Carmelo Provenzano

A thesis submitted to the Department of
Management of the London School of Economics for
the degree of Doctor of Philosophy, London, February
2013

Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

The copyright of this thesis rests with the author. Quotation from it is permitted, provided that full acknowledgement is made. This thesis may not be reproduced without my prior written consent.

I warrant that this authorisation does not, to the best of my belief, infringe the rights of any third party.

I declare that my thesis consists of <48234> words.

[See Regulations for Research Degrees, paragraphs 25.5 or 27.3 on calculating the word count of your thesis]

Acknowledgments

I thank the many people who have been important in helping me to complete my thesis.

My wife Maria, my brother Enzo and my father, all my family and friends have provided constant love, patience, trust and encouragement to me. My children, Giuseppe and Mariachiara, have also kept on, providing me with love and entertainment while I was “working on my computer”.

I thank my supervisor David Marsden for his guidance, support and wisdom throughout the process. I am honoured to have worked, learnt and shared my ideas with him.

I also want to thank both my examiners, Geoffrey Hodgson and Paul Willman, for their advice.

I would like dedicate this thesis to all those who suffer from Alzheimer's disease but in particular I would like to thank my mother who departed from us on 26th of December before I presented the thesis.

This thesis is just my kind act in response to her love and her gentleness. Reciprocity matters, not only in employment relationship, but also in our ordinary and family life. Reciprocal relationships go beyond death and this is not a scientific or experimental outcome but results from my having trust in my beliefs and feelings.

*To the memory of my mother
and to all patients with Alzheimer's disease*

Abstract

Homo oeconomicus has dominated mainstream Economics during the last century. One of the main assumptions of this model is that humans maximise their own utility functions. In other words, *homo oeconomicus*, before taking action, considers the consequences on their own future interests, which are generally assumed to be monetary. This thesis provides experimental results showing that human behaviour often differs from that of *homo oeconomicus*, particularly in environments where trust and reciprocity are salient concerns. To be precise, this dissertation analyses the employment relationship, focusing particularly on the importance of trust and the role of direct reciprocity in the relationship between managers and workers. Reciprocity is an important contract enforcement device in the presence of incomplete labour contracts. By reciprocity between employer and employee, what is meant is a predisposition, within the institutional context of defined employment tasks, to cooperate with the other party even at personal cost, and a willingness to punish the other party if they violate cooperative norms, even when punishment is costly to the individual.

The original contribution of this thesis goes beyond this result and shows the impact of informal employment rules on reciprocity. In particular, it uses experimental methods to identify two distinct governance patterns for employment relationships: the rigid governance structure and the flexible governance structure. The former is characterised by task-centred rules and defines the boundaries of jobs in a much more specific way than the latter, which is characterised by function-centred rules, and gives rise to a more flexible and discretionary model of employment relationships. The most important original experimental result of this thesis is that rigid governance characterised by task-centred rules and low reciprocity is better suited to one-shot transactions, whereas flexible governance characterised by function-centred rules and a high level of reciprocity is better suited to repeated transactions.

Contents

<i>Introduction</i>	11
----------------------------	----

Chapter 1

The Theoretical Prerequisites of Trust based on Reciprocity

1	Introduction	20
2	Calculative Trust and Trust based on Reciprocity	21
3	Direct and Indirect Reciprocity	26
4	Biological inheritance and the social embeddedness of prosociality	34
5	Conclusions	39

Chapter 2

Reciprocity and the Gift-Exchange Game

1	Introduction	41
2	Opportunism in the Employment Relationship	43
3	Tit for Tat strategy vs Reciprocity	46
4	Opportunism and Reciprocity in the Gift-Exchange Game	51
5	Conclusions	55

Chapter 3

Beyond The Gift-Exchange Game:

The institutional Details of Reciprocity

1	Introduction	57
2	The employment rules	58
3	The Interplay between Employment Rules and Reciprocity: some Examples	63
4	Rigid Governance or Flexible Governance Structure	67
5	Conclusions	73

Chapter 4

Rigid Governance Structure vs Flexible Governance Structure in the Institutional Gift-Exchange Game

1	Introduction	75
2	Some General Considerations about Experiments in Economics	77
3	The Institutional Gift-Exchange Game	81
4	Experimental Results	86
	The Analysis of the Experimental Results in the Payoff Map of Institutional	
5	Gift-Exchange Game	91
6	Conclusions	99

Conclusions	101
--------------------	-----

Appendix I

<i>Tables of Experiments</i>	110
------------------------------	-----

Appendix II

<i>Real Effort, the Use of the Computer and Rewards</i>	117
---	-----

Appendix III

<i>Isoeffort Line, Isowage Line and the Maximum Workplace Welfare Achievable with Equal Payoff</i>	139
--	-----

References

145

List of Tables and Diagrams

Table 4.1		
<i>Levels of effort and costs</i>		83
Table 4.2		
<i>Different transactions</i>		85
Table 4.3		
<i>Summary of average values during the treatments</i>		86
Table 4.4		
<i>Tobit</i>		87
Figure 4.1		
<i>Average wage and effort levels in the OSF treatment</i>		88
Figure 4.2		
<i>Average wage and effort levels in the OSR treatment</i>		88
Figure 4.3		
<i>Average wage and effort levels in the RF treatment</i>		89
Figure 4.4		
<i>Average wage and effort levels in the RR treatment</i>		90
Figure 4.5		
<i>Isoeffort line</i>		92
Table 4.5		
<i>The coordinate of isoeffort lines</i>		93
Figure 4.6		
<i>Isoeffort map</i>		94

Figure 4.7	
<i>Payoff map</i>	95
Figure 4.8	
<i>Rigid and flexible areas in the payoff map</i>	96
Figure 4.9	
<i>Experimental results in the payoff map</i>	97
Table A1	
<i>Data OSF treatment employer's profile</i>	111
Table A2	
<i>Data OSF treatment employee's profile</i>	112
Table A3	
<i>Data OSR treatment employer's profile</i>	113
Table A4	
<i>Data OSR treatment employee's profile</i>	114
Table A5	
<i>Data RF treatment for pairs of subjects</i>	115
Table A6	
<i>Data RR treatment for pairs of subjects</i>	116
<i>Telephone directory (sample page)</i>	121
<i>Glossary of Japanese words (sample page)</i>	122
<i>List of initials, acronyms and abbreviations (sample page)</i>	123
<i>Software configuration</i>	126
<i>Employer's interface in the function game</i>	127
<i>Employer's interface in the task game</i>	128
<i>Worker's interface in the function game</i>	129
<i>Worker's interface in the task game</i>	130

<i>Salary offer (details)</i>	131
<i>Payoff calculation in the worker's interface (detail)</i>	132
<i>Effort level and acceptance or refusal (detail)</i>	133
<i>Actual earnings seen by the worker (detail)</i>	134
<i>Insertion of work –function (detail)</i>	135
<i>Insertion of work-task (detail)</i>	136
Figure A.1	
<i>Isoeffort lines and salary levels</i>	140

Introduction

Homo oeconomicus dominated mainstream economics for most of the last century. One of the main assumptions of this model is that human beings maximise their own utility functions. In other terms, before taking action homo oeconomicus considers the consequences on their own future interests, which are generally assumed to be monetary (or material gains). John Stuart Mill (1909/1848) introduced the model of homo oeconomicus as an abstraction of human behaviour and argued that economics

«is concerned with him solely as a being who desires to possess wealth, and who is capable of judging the comparative efficacy of means for obtaining that end » (John Stuart Mill, 1909/1848: 326).

This model of the rationally self-interested agent has been used by rational choice theory to explain how people behave in strategic situations. Conversely, this thesis provides experimental results which show that the behaviour of many people departs from that of homo oeconomicus in environments where trust and reciprocity are salient concerns. To be precise, this dissertation analyses the importance of trust and the role of direct reciprocity between managers and workers within the employment relationship.

Trust can be defined as an expectation and it is related to situations of uncertainty in which agents take risks. Trust means that people do not expect others to exploit their vulnerability.

«when we say we trust someone or that someone is trustworthy, we implicitly mean that the probability that he will perform an action that is beneficial or at least not detrimental to us is high enough for us to consider engaging in some form of cooperation with him» (Gambetta, 1988: 217).

In other words, trust emerges in circumstances wherein the risk a person takes depends on how another person acts (Coleman, 1990).

On the one hand, agents are “trusters” when they have faith in others who do

not take advantage of them. On the other hand the trustees, that is, agents who receive such positive expectations are trustworthy if they do not take advantage of others (when trusted). According to rational choice theory, people are trustworthy in the absence of strong incentives for them to behave opportunistically. Trustworthiness, according to the homo oeconomicus model, occurs when rational agents are – or appear to be – honest if this behaviour pays more than dishonesty. In this approach, people trust others when it is in their interest to behave honestly and to honour the positive expectation received. The problem with this perspective is that by changing the transaction payoffs, agents may cease to be interested in being trustworthy. In effect, situational changes may reduce the incentive to cooperate.

In contrast to rational choice theory, in which trust depends on the expected payoffs of the cooperative game (see Sugden, 1989), people can have faith in others even in the absence of explicit incentives. Trust does not derive solely from such incentives, thus it cannot be entirely explained by traditional rationality defined in terms of the consequences of behaviour. Trust can exist when people retain a vulnerability to exploitation. This kind of trust is a stronger concept than that based on material incentives since it may survive situational changes.

It is possible to understand why people trust others, even when they remain vulnerable to exploitation, if we look beyond the homo oeconomicus model. Individuals could either be genetically programmed to trust others and be trustworthy or they could be culturally driven to be cooperative. Rather than being motivated by material gain, agents may obtain personal satisfaction by being spontaneously cooperative.

Generally speaking, intrinsic kindness may be fostered by social preferences such as altruism (Andreoni and Miller 2002), inequity aversion (Fehr and Schmidt, 1999) or reciprocity. These preferences induce individuals to trust and be trustworthy even if both actions may not pay monetarily. Pure altruism is a form of unconditional kindness, i.e. individuals may be willing to transfer material resources to a relevant reference agent. This form of altruism does not originate as a response to received kindness. According to Thomas Nagel, altruism is

«(...) a willingness to act in consideration of the interests of other persons, without the need of ulterior motives » (Thomas Nagel, 1970:79).

Thus an individual's preference for another individual's material well-being is called unconditional altruism. Furthermore, giving may increase personal psychological pleasure, a process known as "warm glow" (Andreoni 1990). This motive is understood as the donor's preference for giving per se, different from the profit attained by the recipient. A combination of pure altruism and warm glow is impure altruism (Andreoni 1989;1990).

An altruistic individual, thus, never behaves in a way that reduces the payoff of a reference agent. Instead, according to the model of inequity aversion (Fehr and Schmidt, 1999), people do not like inequitable income distribution. Instead, they want to reduce the level of other individuals' material payoff if this level is above the equitable level. Furthermore, money is not people's only concern, and they may be altruistic towards subjects having a level of payoffs smaller than some equitable benchmark.

Another important form of social preference, as noted above, is reciprocity. Direct reciprocity occurs when people act in a more cooperative way in response to the kind behaviour of others (positive reciprocity) and behave in a hostile manner when treated in an unkind way by others (negative reciprocity). Reciprocal individuals want to be friendly with people that have been previously kind to them, and want to punish others for unfair or hostile actions. How kindness is perceived depends on the fairness or unfairness of the effects and the intentions in relation to the behaviour of other agents (Charness and Rabin, 2002). By other agents' intentions, we mean why agents have taken particular actions. Fairness may be quantitatively defined by the difference in the payoffs of the receiving and sending subjects (see also Falk and Fischbacher, 2006).

Furthermore, reciprocity differs from "retaliatory" behaviour in repeated interaction. Certainly, reciprocity does not depend on expectations about future material gains, but goes beyond extrinsic incentives. Intrinsic reciprocity occurs when people reward kind actions and punish unkind actions, even if this is costly in terms of material well-being (e.g. Rabin, 1993; Dufwenberg and Kirchsteiger, 2004)

In the workplace, employees react to fair wages with increased job effort, and to unfair wages with decreased effort. The importance of reciprocity in labour markets has been demonstrated by previous experiments (Fehr Kirchsteiger and Riedl, 1993; 1997; Fehr and Falk, 1999; Croson, 1996; Guth, Klose, Konigstein and Schwalbach, 1998; Keser and Winden, 2000; Fehr and Gächter, 2000; Falk

and Gächter, 2002; Brown, Falk and Fehr, 2004).

The original contribution of this thesis is to examine both positive and negative reciprocity in employment relationships by assessing the role of informal employment rules in several tightly-controlled laboratory experiments. According to David Marsden (1999), certain kinds of transaction rules may gradually emerge which define workers' obligations and limit the authority of employers. The impact of such rules on reciprocity in the employment relationship is complex. They are simple rules that may focus on function or may directly identify certain kinds of work tasks. Two kinds of transaction rules can be identified: task-centred rules and function centred rules. The former identify individual tasks and define the assignment of jobs to groups of workers. These rules create a clear and rigid relationship between tasks and jobs and may be inflexible. The latter, instead, focus on procedures and functions required by an organisation. These rules are more flexible and define jobs in a closer relation to their final purpose.

By focusing on several institutional contexts of the employment relationship, this thesis identifies the different effects on reciprocity and thus on performance. In other words, this study attempts to understand the institutional embeddedness of reciprocity. The notion that the employee's discretion differs between institutional environments may also help to explain some of the many differences observed in the reciprocal behaviour of employees.

In principal-agent theory, principals will be exploited if they give discretion to agents. The temptation for an agent to shirk may be reduced by the provision of material incentives. More precisely, the payment the principal offers depends on the level of discretion permitted. On the one hand, when an agent has more actions to choose from, the principal may reduce the temptation to shirk by tying large material incentives to the desired course of action. On the other hand, if the agent has less discretion, the implementation of an action is less costly for the principal. In such a situation the principal should reduce the discretion given to the agent in order to reduce implementation costs. Furthermore, the principal may derive supplementary informal signals about the agent's behaviour through closer monitoring and control (Grossman and Hart, 1983). In this situation the implementation of an action may require cheaper incentive compatibility constraints.

Similarly, on the basis of Tayloristic principles (also referred to as 'scientific management') the diffusion of tightly-controlled rules and the prevalence of

standardisation of the production process in many organisations becomes necessary in order to increase the efficacy of control, workers' effort and, consequently, firms' profits. Nevertheless, contemporary human resource management theories emphasise the cost of control, and emphasise that work discretion is an important source for providing job satisfaction, quality of life among employees, organisational flexibility, and efficiency. Under these new approaches, whilst strictly applied rules do increase enforceability, they may also reduce productivity and efficiency. Workers who have less discretion are unable to use their own knowledge and creativity to solve problems on the shop-floor. In contrast, flexible rules increase the vulnerability of the organisation in the sense that employees have the autonomy to choose whether to act in the interest of their organisation or to shirk. This said, such rules allow workers to solve problems caused by changes in the working environment. Furthermore, offering discretion to an agent may be a critical component of a trust strategy. While a control strategy based on rigid rules is a signal of distrust, discretion combined with high wages may increase reciprocity and thus efficiency.

Reciprocity works better with function-centred rules rather than task-centred rules, and with discretion rather than rigid regulation. This thesis investigates this idea using an experimental analysis of the relationship between reciprocity and the workplace environment in which employees operate. In particular, this research analyses the degree of autonomy that workers have to organise their work and accomplish their job tasks. Where workers have more decision powers, they are able to achieve high performance and create an environment of trust. Therefore, discretion is an important workplace characteristic, which can have a significant impact on trust and reciprocity.

Chapter 1 – The Theoretical Prerequisites of Trust based on Reciprocity –

This chapter addresses the fundamental question of whether trust based on reciprocity can be considered as a governance device to enforce fulfilment of economic transactions. Trust means accepting vulnerability on the basis of positive expectations about the intentions or the behaviour of others (Rousseau *et al.* 1998: 395). If agents are trustworthy, the returns to people who display trust towards them are increased. The question remains though, as to why people should be trustworthy, since according to the standard theory economic agents are rational and self-interested. They protect their reputation - the level of trust one is

perceived to merit - because it increases future trading opportunities (Kreps 1988). As a consequence, agents may confide in other individuals on the basis of rational calculation. In recent years, several economists analysed social or “other-regarding preferences” (For example, Bowles and Gintis 2011, Camerer and Fehr 2006, Charness and Rabin, 2002, Fehr and Camerer 2007) finding that reciprocity is an important social preference. Thus, from this perspective it can be seen that trust does not necessarily follow rules of calculation; rather, it can be argued that it proceeds from the idea that other individuals are intrinsically trustworthy. People may trust other individuals’ intentions because they have social preference for reciprocity. If an agent has been kind to another agent, the latter would be influenced and may feel obliged to reply in a positive reciprocal manner. There is a significant distinction between these two kinds of trust. Trust based on reciprocity emphasises the relationship between trust and investment in relations and lies primarily in the intrinsic value of reciprocity (Blau 1964; 1994).

Homo oeconomicus would never behave in a reciprocal manner, given that he pursues material self-interest. An alternative model is *homo reciprocans*, who acts on the basis preference for reciprocity (Rabin, 1993; Falk and Fischbacher, 2006). This kind of agent is capable of intrinsic reciprocity because they have a moral code, meaning ethical feelings and beliefs formed in the social interaction process. In addition, genetic mechanisms should be analysed in order to understand the evolution of morality and sociality. As such, both genetic and cultural mechanisms are needed to explain prosociality.

Chapter 2 – Reciprocity and the Gift Exchange Game – This chapter introduces the nature of the employment contract and explains how employees agree to accept the authority of their employer in exchange for a wage. The employer’s authority means the possibility of choosing a set of specific actions which workers must perform. The employer’s ability to continually influence workers’ behaviour is a considerable advantage. In other words, the possibility of identifying an agreed zone of acceptance for the worker is a source of flexibility. However, employees have more information about the work tasks. In this context of asymmetric information, workers will not be cooperative unless incentives make it in their interest to do so. According to Williamson (1975), economic agents are boundedly rational and self-interested (1975). Furthermore, in the social domain of market relationships, trust is redundant, since it is immediately

exploited by other opportunistic parties (Williamson, 1993).

In particular, the chapter analyses Williamson's contractual approach and suggests going beyond it by investigating an alternative approach to the employment relationship. Williamson's "opportunism core model" is not confirmed by the experimental evidence, which shows that people are not solely opportunistic, but are also inherently trustworthy and have preferences for reciprocity. More precisely, reciprocity as a governance device in the presence of imperfect labour contracts is analysed and experimentally verified by means of the gift-exchange game (Akerlof 1982, Akerlof and Yellen, 1990). In the experiments, people deviate from purely selfish actions in a reciprocal manner (see, Fehr Kirchsteiger and Riedl, 1993; 1997; Fehr and Falk, 1999; Croson, 1996; Guth, Klose, Königstein and Schwalbach, 1998; Keser and Winden, 2000; Fehr and Gächter, 2000; Falk and Gächter, 2002; Brown, Falk and Fehr, 2004).

Chapter 3 – Beyond the Gift Exchange Game: the Institutional Details of Reciprocity – This chapter goes beyond the concept of organisations as a nexus of internal contracts (as developed by Transaction Cost Economics) and instead focuses on firms as institutional and reciprocal exchange networks. More specifically, Williamson (1993) tells us that trust is redundant in economics, and that economic agents are interested only in their own material well-being. This thesis considers these assumptions and evaluates the insights derived from them by means of experimental tests. The predictions of the theory are compared with the choices made by experimental subjects in controlled laboratory conditions. The experimental results deviate substantially and systematically from what the theory suggests, showing that William's opportunism theory of the firm is not certain. Many experiments indicate that reciprocity matters: see, Fehr Kirchsteiger and Riedl, 1993; 1997; Fehr and Falk, 1999; Croson, 1996; Guth, Klose, Königstein and Schwalbach, 1998; Keser and Winden, 2000; Fehr and Gächter, 2000; Falk and Gächter, 2002; Brown, Falk and Fehr, 2004. Furthermore, reciprocity can ensure more efficient payoffs, and is influenced by the characteristics of the institutional environment. Thus, governance models based on employment rules and reciprocity affect and change the payoffs attached to particular choices and actions for the parties involved in employment relationships. Reciprocity is influenced by the details of various transaction rules. Experiments allow us to test the different effects of several rules and to

understand economic performance.

An analysis of efficiency and enforceability of reciprocity requires an understanding of how it is combined with varying transaction rules. Institutions may thus have an impact on reciprocity. An employment contract is not completely specified and is costly to enforce. The conditions of the relationship depend on organisational governance, which can emerge out of interaction between informal rules and reciprocity. Informal rules enable employers and employees to identify the tasks over which a particular job extends. They have to satisfy two sufficient and necessary conditions to enable effective employment relationships to take place: efficiency and enforceability. The latter is an essential requirement of the norms for controlling possible forms of opportunism, and it may be achieved by means of two different types of transaction rules: task centred rules, which are rigid and directly identify particular task characteristics which link them to a job; and function-centred rules, which are flexible and provide only an indirect link between individual tasks and jobs. As such, this thesis suggests introducing other variants of the gift exchange game representing different institutional environments.

Chapter 4 –Rigid Governance Structure versus Flexible Governance Structure in the Institutional Gift-Exchange Game – This chapter describes the “institutional gift-exchange game” in detail, and offers three important innovations: the introduction of new types of transactions which take into account various institutional cultures affecting labour relations; the completion of real tasks; and the use of computers by the players during the course of the experiment. More precisely, the “institutional gift-exchange game” comprises four treatments: the one-shot rigid treatment, characterised by non-repeated iterations and a rigid institutional environment; the one-shot flexible treatment, characterised by non-repeated iterations and flexible institutions; the repeated rigid treatment, characterised by repeated iterations and a rigid environment; and repeated flexible treatment, characterised by repeated iterations and flexible institutions. The transaction rules and reciprocity mechanisms in these treatments offer a foundation out of which employment cooperation and spontaneous coordination may be achieved.

Furthermore, this chapter summarises the main results of the institutional gift-exchange game and analyses how the power of reciprocity depends on the specific

make-up of the institutional structure of employment relationships. Both the rigid and the flexible governance structures help to overcome opportunism in the employment relationship. It is unlikely that one is absolutely superior to the other, although the flexible governance structure fosters reciprocity and high performance but does not guarantee stability. The rigid governance structure, on the other hand, provides stability by reducing reciprocity and by sacrificing flexibility and efficiency in production. In order to understand the game and its experimental results better, this chapter presents a payoff map, representing a set of possible combinations of the employer's profits and worker's benefits that are achieved in each period. The map clearly provides complete information about workplace welfare (the total amount of players' gains). By tracing the points corresponding to the payoffs obtained during the experimental iterations onto the map, we can immediately verify the various patterns of performance, show the location of points compared to the theoretical payoff frontier (a geometric location of points which correspond to optimal payoffs) and make comparisons between the different treatments.

Finally, this thesis concludes with brief observations derived from the experimental results. A significant problem is whether these experimental results can be generalised. There are two issues regarding this problem: whether the chosen subjects are representative (population validity), and whether laboratory experiments are too simple compared with the environment of the real firm and its employment relationships (environment validity). With regard to the first point, students are often used as subjects because they are available and have relatively low opportunity costs. There are also several replications of experiments using real world traders, managers, professional auction bidders and lobbyists as participants. Even though some differences can be seen, the general pattern of observed behaviour tends to correspond remarkably well with those of the student subjects. With regard to the second point, environment validity, it must be accepted that all economic models are abstractions. In economics, the main purpose of experimentation is to identify the essentials of an environment in order to be able to disregard less important variables. However it must be recognised that experiments, like any method, have their limits. Experiments are no panacea, but rather a valuable additional source of information.

CHAPTER 1

The Theoretical Prerequisites of Trust based on Reciprocity

1. Introduction

It is widely believed that trust, as an instrument for the governance of economic relationships, contributes to prosperity by reducing both uncertainty and transaction costs. As is often mentioned in the literature, the general notion of trust is closely related to the notion of uncertainty or risk in the sense that things can go wrong. Trust may mean accepting risk or uncertainty about the competence or the intentions of other actors as well as events that might arise in the future and increase vulnerability (Luhmann, 1979; 1988; 1995; Rotter, 1980; Shapiro, 1987; Zucker, 1986). Trust may be defined as

«a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or the behaviour of another» (Rousseau *et al.*, 1998: p. 395).

Behavioural interpersonal trust may be defined as the willingness to be more vulnerable to those whose behaviour is not controlled (Zand, 1972). This thesis deals with trust in relation to the possibility of opportunism (Barber, 1983). Trust in a person's technical competence must be distinguished from trust in a person's intentions, character or moral disposition, since the former is not directly related to the concept of opportunism (Barber, 1983; Gabarro, 1978; Sitkin and Roth, 1993). The reason why workers may not honour their commitment may be incompetence, force majeure or opportunism, and the appropriate response from managers depends which of these is applicable. For example, managers may develop workers' skills by training or improving their motivation, or by exerting greater control.

Trust in an individual's intentions consists in believing the other party will not behave opportunistically even though it has the ability to do so, and where it

may even be in its short-term interest to do so. In other words, one party trusts the other if it believes that the opportunity to defect will not lead to a reduction in the other party's trustworthiness (Nooteboom, 1996; 2000). On the one hand, trust does not always follow calculative rules; on the other, trust is not only blind but may be based on reciprocity. If one agent makes a gift to another, they have made an investment in the relationship that has an immediate return as relational credit. They trust others' intentions because they feel obliged to return this favour. This definition of trust based on reciprocity is related to concepts such as beliefs, norms and morality.

Our understanding of organizations and employment relationships is inadequate unless we appreciate the moral motivations of individuals within them, and how those institutions help to sustain and replicate these moral sentiments. Morality or reciprocity is a profoundly social phenomenon, reflecting both our biological inheritance and our embeddedness in society.

2. Calculative Trust and Trust based on Reciprocity

Many versions of rationality have been provided in economics (Sen 1987). One predominant notion of rationality is "payoff rationality" or "payoff maximization". According to this theory, economic agents are rational and self-interested, not motivated by morality, and seek only to maximise their selfish utility function. Economic man is narrowly defined as a "pleasure machine" without a moral code. Hodgson claims:

«Economic man is a pleasure-maximizing machine, rather than a reflective individual capable of addressing moral dilemmas, absorbing moral principles, and performing or reframing from true generosity. For economic man, utility is the only measure of moral worth» (Hodgson, 2012: 10).

Economic man's satisfaction is influenced solely by explicit rewards. In other words, the dominant concept of rationality in modern mainstream economics concerns the maximisation of payoffs consisting only of pecuniary gains. By "payoff rationality" Hodgson means:

«the maximization of such explicit payoffs by players, given the information available to them plus their assumption that other players are also payoff maximizers» (Hodgson, 2012: 47).

The question why rational individuals trust or why people are trustworthy is an interesting one. Trust involves risk related to other people (Coleman, 1990; Sztompka, 1999; Gambetta 2000; Hardin, 2006; McKnight & Chervany, 2001). If people have positive expectations about the future, they voluntarily make themselves vulnerable and spontaneously accept the cost if the events they trust in do not materialise (Coleman, 1990). One reason why people trust may be based on the perception that the other party will cooperate because it is in their own interest to do so. In other words, trust may be calculative in the sense that people confide in one another on the basis of rational considerations about the consequences of their trust decision. According to this perspective, the decision to trust another person is essentially strategic. Thus, calculative trust may arise from the strategic interaction of egoistic economic agents and may be preserved so long as it serves their own self-interest. The probability of opportunistic behaviour is reduced by control, sanctions and punishment (Dasgupta, 1988).

If people are simply egoistic utility maximisers, trust may be also based on the reputation. Calculative agents may be trustworthy because they want to build their reputation and permit others to trust them. In this way they increase the probability of future profitable exchange. An individual's reputation is increased by adherence to the norm and is reduced by resistance to the norm. Indeed, people see this as a signal of trustworthiness and as a predictor of individuals' future conduct (Axelrod, 1986). Reputation in repeated games with a fixed set of players may be achieved over time by investing a small amount of resources at the beginning of the game when information about the other party is limited, and by sustaining mutual trust through increased cooperation following successful experiences (See Sobel, 1985).

In game theory, a payoff is described as a monetary or explicit reward. However, according to the experimental evidence (Smith, 1982), there is not always a "parallelism" or a "monotonic relation" between the utility function and monetary payoffs. Hodgson states that if people act according to payoff rationality they also act on the basis of rationality, which involves consistent actions. Despite

the axioms of payoff rationality implying consistent actions, the opposite is not necessarily verifiable. Thus Hodgson concludes:

«Without logical contradiction, one can abandon payoff rationality and still uphold that behaviour is consistent, and even utility-maximizing» (Hodgson, 2012: 48).

Gintis is one of the most important economists taking this view, providing a concept of rationality defined as consistency of behaviour. In particular, having analysed many experiments, he explains that agents also behave consistently in the absence of payoff maximisation. Such behavioural consistency is based on instincts and urges which are genetically rooted and which have evolved over time. Human beings are not merely self-regarding, but are predisposed to respond in specific ways to specific cues (Gintis, 2007; 2009). Thus, trust can also be based on the perception that the other is not only instrumental but may be intrinsically trustworthy. As such trust or trustworthiness may not be completely calculative, but may be based on other motives that go beyond personal gain. Therefore, it is possible to identify certain social reasons why people trust that are not necessarily related to the reputation of the other party.

In the utility maximising model, the role of human culture and institutions and the importance of human psychology are not analysed deeply. These elements are distinctive, and separate human beings from animals. According to standard economic theory, the preferences of “rational economic man” are not affected by institutions or culture. For Hodgson, the human psyche, human interaction and human nature are not deeply analysed in the *homo oeconomicus* model. In particular, Hodgson claims:

«The nonfalsifiability of the concept of rationality as-behavioral-consistency-or utility-maximization sustains an *epistemic* critique. It does not clinch the matter. One has to consider the *theoretical* limitations of this stance. Here rationality-as-behavioral-consistency-or-utility-maximization falls down for at least two reasons. First it neglects the problem of *explaining the causes* of behaviour. Second it fudges the question of the individual *development* of capacities and dispositions» (Hodgson, 2012: 54).

Thus, utility theory is not able to explain human dispositions and interactions, but is rather a kind of formal and mathematical ex-post explanation of behaviour. As such it is not a grounded causal theory able to understand the nature of human motivation and behaviour. Hodgson argues:

«For related reasons, claims that there is an evolutionary basis for utility maximization (Robson 2001, Gintis 2006, p.17) do not pass muster. It is insufficient to show that the behavioral outcomes of evolution are consistent with some utility function. Ultimately this claim is trivially true, because one can always find a function that fits. One has to show that utility maximization is useful causal account of behavioral motivation. This is problematic, (...). Indeed, it is rather odd to claim simultaneously that evolution has produced individuals that maximize utility and are also capable of altruism, as a consequence of inclusive fitness or whatever » (Hodgson, 2012: 54)

Human beings are also concerned with “doing the right thing”. Many individuals and also certain non-human animals show clear patterns of altruism and reciprocal behaviour. De Waal (1989), for example, explains that food sharing is a common phenomenon among chimpanzees. Thus, we need to go beyond the model of homo oeconomicus in order to explain altruism and reciprocal behaviour by reference to psychology and other evolutionary and social matters. Payoffs may be also implicit in this.

As a rule, human beings seek honour, justice and prestige. Furthermore, people sacrifice their material well-being to help others. For example, people exhibit social preferences if they also care about the material resources allocated to their trading partner, their manager or other actors. Recently, many economists attempted to explain cooperation, altruism and “social” or “other-regarding” preferences (e.g. Bowles and Gintis 2011, Camerer and Fehr 2006; Charness and Rabin 2006, Fehr and Camerer 2007). This dissertation focuses on one kind of social preference, namely the preference for reciprocity. In particular, the main idea developed is that reciprocity radically changes the interaction strategy between economic agents. Thus, individuals’ sole objective is not simply pleasure, but they are affected by moral concerns such as self-image, integrity and commitment which are essential to understanding phenomena such as trust or

reciprocity. For Hodgson, individuals act according to some moral code of behaviour. In particular he claims:

«... real humans are often concerned with *doing the right thing*, sometimes even against their own interests, and notwithstanding that their moral code may be flawed. We seek honour and justice as well as our own prosperity and prestige. We sometimes act out of duty and not mere self-interest. We have moral motivations because we have long evolved as social beings and we are affected profoundly by our interactions with others» (Hodgson, 2012: x).

Accepting the importance of morality is crucial for explaining human motivations, the behaviour of individuals and their interaction with others. Thus, trust and trustworthiness may be driven by other factors unrelated to material payoff, such as unconditional kindness, as demonstrated by experiments conducted in Russia, South Africa, and the U.S. by Ashraf *et al.* (2006). Trust may therefore be based on « some sort of belief in the goodwill of the other » (Seligman, 1997:43).

Trust may be moralistic in the sense that it may be based on close, long-term relationships, a sharing of goals and expectations and the suppression of short-term self-seeking. This can result in a degree of altruistic behaviour. The parties' behaviour is not reducible to self-interest, even of a long-term kind: instead, it is suggested that social or personal trust develops from and is maintained by shared cultural values and history. Morality is an alternative explanation for some of the other forms of trustworthiness, with moralistic trust going beyond instrumentally rational behaviour. Herbert Gintis, Joseph Henrich, Samuel Bowles, Robert Boyd and Ernst Fehr argue that:

«... ethical behaviour was fitness-enhancing in the years marking the emergence of Homo Sapiens, because human groups with many altruists fared better than groups of selfish individuals, and the fitness losses sustained by altruists were more than compensated by the superior performance of the groups in which they congregated» (Gintis *et al.*, 2008: 2).

Samuel Bowles and Herbert Gintis (2011) have analysed the evolution of cooperative and altruistic behaviour. Any analysis of cooperation and altruism must take into account morality. Individuals, as members of a group, are affected by their group's moral norms as Hodgson notes: « Humans were the first species to develop and articulate moral codes; but the foundations of morality go back into our prehuman past » (Hodgson 2012: 106). Furthermore, Hodgson argues:

« The whole point of a moral system, and a reason for its evolution and survival, is that it acts partly at the discursive level to restrain all persuasive rationalizations of self-interest. This does not mean that it always works in this way. But it can be a powerful social mechanism to restrain deliberative revelations of self-interest » (Hodgson 2012: 120)

Altruism may derive from a number of motives, including perceptions of moral obligation. However, altruism and morality are not the same and should not be treated as interchangeable. Thus, as Hodgson notes, « moral factors are irreducible to altruism » (Hodgson, 2012: 124).

3. Direct and Indirect Reciprocity

As noted above, the empirical and experimental evidence indicates that people reveal social preferences, in the sense that they not only care about the material resources assigned to them but also about the material resources assigned to other relevant agents such as their relatives, their neighbours, colleagues and trading partners (for surveys see Fehr and Schmidt, 2001a; 2001b and Sobel, 2001).

Traditional theory explains “altruism” or “cooperation” in terms of individual utility maximisation. It does not focus on pure altruism. Pure altruism implies that the act must consider the interests of other people and that one does not need “ulterior motives” (for example, selfish motives) to justify such behaviour (Thomas Nagel, 1970:79). Clearly, other motives may exist but they cannot be the only motives to explain altruistic behaviour. Taking into account the

role of prosocial motivations does not mean limiting selection to a virtuous, trustworthy human being. Individuals may be selfish and prosocial.

Reciprocity should be distinguished from purely altruistic actions, which consist in isolated and one-way transfers. If agents do not receive reciprocity their level of trust in the other party will be reduced and the relationship may end. But in this case, unlike the exchange situation, the logic of the transfer is changed. In the exchange relationship, the transaction is carried out only after the parties have reached an agreement and have determined the price. In a reciprocal relationship, on the other hand, the transfer takes place (locally and temporally) prior to other transfers. In this scenario the parties have only an expectation, rather than a right, to receive the transfer. One could say that reciprocity occupies an intermediate position between economic exchange and pure altruism and that trust based on reciprocity lies between blind trust and calculated risk (Kolm, 1994).

Reciprocity can be considered as a contingent social preference because it is correlated with the behaviour of a reference person. By judging the consequences and the fairness of the intention underlying the principal's action, the reciprocal agent may perceive it as either kind or hostile. In the first case, the agent evaluates the principal's material payoff positively, in the second case negatively.

In repeated interactions, it is important to distinguish reciprocity from "cooperative" or "retaliatory" behaviour. In the former, individuals are responding to friendly or hostile behaviour even if no material benefits can be expected, whereas in the latter, agents expect future explicit payoffs from their behaviour. Furthermore, while explicit performance incentives may cause a hostile social environment and reduce the willingness for co-operation, reciprocity-based extra effort may cause an atmosphere of mutual trust and cooperation. Bewley shows that many managers believe that explicit « punishment should be rarely used as a way to obtain cooperation » (Bewley, 1995: 252).

In a reciprocal relationship, individuals do not keep detailed track of each other's input in joint tasks, because such record-keeping is not necessary in the allocation of rewards (Clark, 1984). Parties in such relationships do not like to use cash to pay the other party because the relationship is seen as too special to be carried out with general-purpose money (Webley and Lea, 1993).

The returned benefit of a reciprocal relationship is understood as an attempt to fulfil a need, to please the other or to respond positively to the sadness of another person (Clark 1981; Clark *et al.*, 1987; Clark and Mills, 1979; Uehara,

1995; Deutsch, 1975). The intention of each party is to increase the welfare of the other party because he or she is included in the extended self (Cialdini *et al.*, 1997). Mutual awareness of the responsiveness to each other's needs creates a basic feeling of safety (Chance, 1988). The parties involved provide a value to the reciprocal relationship in itself. This meaning is given even when there is no need. This non-instrumental attitude towards the relationship involves a different perception of its costs and benefits and is based on reciprocal positive expectations (O'Connell, 1984). Furthermore, agents who are involved in a reciprocal relationship have a non-calculative attitude towards the short-run results of the relationships. Thus, agents in this diffuse exchange do not calculate the benefits of each individual transaction, but look for some degree of equivalence over time. If the party who received a gift attempts to repay it immediately, they might embarrass the other party (Clark and Mills, 1979; Schwartz, 1967). Such benefits need to be comparable, but their non-comparability does not limit the functioning of transactions because it is supported by reciprocity. Individuals have diffuse expectations for a return of benefits in the sense that they are willing to agree to an imbalance for a non-determined period. There is always a kind of balance, but more in the sense that "It will all work out" than in the sense of a calculated risk (O'Connell, 1984). Instead of expecting the gifts to be instantly repaid, the agents of reciprocal relationships expect a response when they have specific needs. In general, they would like a better state of balance, but if this is unfeasible, they avoid over-benefiting more than under-benefiting (Uehara, 1995; Van Tilburg 1992). If individuals over-benefit, they do not feel like returning benefits but are affected by feelings of uneasiness or even guilt.

The concept of reciprocity may be strongly related to feelings, beliefs, obligations and other cognitive aspects. In particular, strong reciprocity emerges even if people do not know who they interact with. It depends on well-defined conditions and it is an important source of cooperation even in one-shot interactions where the tit-for-tat mechanism is absent.

Many studies demonstrate that individuals are also driven by strong reciprocity. It is possible to distinguish two kinds of strong reciprocity: strong positive reciprocity and strong negative reciprocity. The former is a predisposition to be kind to those have been kind to us; the latter is based on the "eye for an eye, tooth for a tooth" principle and lies in the disposition to strike back. Many people

respond kindly to “gifts” and retaliate if they have been hurt. Strong reciprocators will reward subjects that cooperate, and punish individuals that defect, even if it is costly for them. Furthermore, individuals may bear the cost of rejecting positive but unequal offers. As a consequence, the other individuals avoid unfair treatment and attempt to negotiate by making equal offers (for a survey of experimental results see Camerer and Thaler 1995, and Roth 1995)

Positive reciprocity has been analysed in the original trust game provided by Berg and others (1995). In this game, there are two kinds of participants, both of which receive an endowment: the sender and the responder. The former may decide to send the total, a part or nothing of his endowment, to the unknown responder. Any money transmitted is increased three times by the experimenter. The responder who sees an increase in their money may choose to return it (totally or in part) to the sender. Any money the responder does not give back may be retained. If the responder is a rational maximiser agent they do not return the money; they play a dictator game and the subgame perfect Nash equilibrium for this game (for self-interested actors) is for the responder to retain the money, and thus for the sender to send none. This elementary trust game resembles the economic setting of one-shot investing with imperfect contracts. The sender (investor) produces value with their investment but is not able to absolutely enter into agreement with the responder (agent) to guarantee sharing the value produced. Furthermore this game is useful to analyse trust and reciprocation in economic conditions. More precisely, this game allows us to study the importance of trust regarding the sender, and of reciprocity regarding the responder.

The experimental research of Berg and others (1995) showed evidential levels of trust and reciprocation: 30 and 32 transmitters sent money in the game (demonstrating trusting behaviour), and 24 of those 30 decisions had money given back in the end (demonstrating positive reciprocity).

Negative reciprocity has been analysed in the ultimatum bargaining game where many individuals interact anonymously with each other and are willing to pay for rewarding kind and punishing hostile acts. An example of negative reciprocity is altruistic punishment. Negative reciprocators take money out of their own pocket to punish unkind individuals.

Hays (1985), in a longitudinal study of friendship, showed that friendship intensity was more highly correlated with the benefits-plus-costs score than with the benefits-minus-costs score (Hays, 1985). Thus, the parties of a reciprocal

relationship or, in general, the members of a close-knit social network have positive feelings towards each other's behaviour and intentions (Lee and Robbins, 1995; Bollen and Hoyle, 1990).

Aristotle uses the term “antipeponthós” to communicate the concept of commercial relationships and relationships between citizens, because all the relationships within the “polis” (or city-state) involve the idea of proportionality of conditions. Gloria Vivenza explains this clearly:

«Aristotle uses the term reciprocity (*antipeponthós*, in *Nicomachean Ethics*, 1132 b 21) to talk about exchange in general. But in all the forms of counter-exchange there is a clear meaning of the term relativity: to give back in proportion (precisely *antipeponthós*) holds the community (*koinonía*) together (*sunéchei*). In brief, the factor which holds together the relationships between citizens or participants in the same community is giving back in proportion to how much one has received; commercial exchange is a particular category of this reciprocity» (Vivenza, 2004: 78.)

Another term used by Aristotle regarding reciprocity is “antiphílesis” or “antiphilía”, which denotes reciprocal affection, feelings, or returning love with love of the same kind and intensity. The prefix “anti” always denotes a response. The term appears, seemingly not by chance, in the “Nicomachean Ethics” (1155 b 28).

Reciprocity and a typical economic exchange includes a two-way exchange involving giving and returning, even though the economic transaction is differentiated by the fact that a third party can render the return obligatory, whereas in simple reciprocity the return gift may be expected but is not obligatory. Relationships which are based both on contracts and on reciprocity contribute effectively to achieving individual and collective results. All the same, cooperation based on reciprocity is more complex than contractual cooperation whose basis is in the mutual consideration of personal interests as set out by Hume (1978(1740)). Instead, cooperation based on reciprocity, tends to be overlaid with the typical relational logic of friendship (*philia*) even when such behaviour might appear to be contrary to the personal interests of the individual for a brief period of time. Again, Aristotle, in the “Nicomachean Ethics”, created

the paradigm of the theory of friendship (intended as a form of reciprocity) in Western culture:

- *Equivalence*: the first characteristic of *reciprocity-philia* is equivalence, not necessarily in the mathematical sense but in the sense of justice or equity, since it associates friendship with justice.
- *Equality*: Aristotle did not believe that friendship could exist between a free man and a slave. This is because there was effectively an inequality between the participants and the “rules of the game” tend to artificially re-establish the equality which is lacking.
- *Liberty*: For Aristotle only the free man could have friends since one initiates and terminates a friendship freely.
- *Non-transferability*: friendship is not transferable in the sense that if X is a friend of Y and if Y is a friend of Z then X will not necessarily be a friend of Z. According to Aristotle, it is not possible to be friends with lots of people.
- *Conditionality*: the logic of *reciprocity-philia* is that in friendship one makes the first move and grants the other party trust based on prior actions, and one is also inclined to forgive. For the reciprocal relationship to continue over the course of time, the other party must reciprocate the treatment. In practical terms, in a relationship based on *philia* (that is, on friendship related to the internal dynamics of a team of colleagues) one does not calculate the costs and benefits of a single act and one even tolerates actions which are wrong, and is inclined to forgive. However, the friendship is terminated when we see the willingness to be a friend cease on the part of the other party, or, in other words, when we realise that he or she does not wish the friendship relationship to continue.

Moreover, Aristotle describes three types of friendship: friendship based on “pleasure”, friendship based on “convenience” and friendship based on “virtue” (Nicomachean Ethics, VIII, 1, p. 341). The real distinction here is between friendship which is based on pleasure or convenience, and friendship which is based on virtue. What the first two types of friendships have in common is that they are instrumental, egocentric and uninterested in underlying motives. In short, the friendship is not an end in itself, but it is the way that individuals can obtain pleasure and convenience; for this reason Aristotle believes that friendships are based on convenience or pleasure, which is always temporary and unstable.

The first two types of “philia” belong to the family of strategies founded on self-interest. Instead, a friendship which is based on virtue is one that is founded on reciprocal trust, which when mutual is an intrinsic value. In other words, one way of expressing “reciprocity” as a type of “philia” is when a person who chooses to behave in a cooperative way has the “expectation” that the other party will also act in the same way. Disposition is not action: what counts is the intention, not only the action. Non-intentional hurtful actions of an agent are easily forgiven by the counterpart because this agent demonstrates that it was not their intention to disappoint their expectations.

Reciprocity has been analysed by many researchers using many different models. In particular, Fehr and Schmidt (1999) have analysed reciprocity using a model of inequity aversion. The intention is fair when it is based on the equity of the payoff distribution. Moreover, in a closely-knit social network characterised by reciprocal relationships, the interests and aim of its members are extended to embrace not only those of additional persons but also of impersonal organisations (Brewer and Gardner, 1996). Members of organisations feel that they belong to a reciprocity group, meaning they are relieved of the burden of keeping track of who helped whom. Belonging to a group built on reciprocity provides its members with the feeling of safety and the awareness that in the future, when needs may arise, the other members will help them (Ueahara, 1995). Thus the motivation which governs the actions of a person who forms part of a team relationship is explained in terms of giving a “sense of belonging” and by the desire to obey social norms and to follow duty (Bruni, 2006).

Sugden (1984; 1993; 2000), in his concept of “team thinking” and “membership”, identifies the definition of rationality of the group (which he distinguishes from the selfishness of the group). “Membership”, as he defines it, has the effect of motivating a person to adopt a “we-mentality”, which has a meaning similar to its original concept whereby the arms and legs are “members” of the body. To act as a member of the team is to operate according to a coordinated plan the prime purpose of which is to achieve the team objectives.

Another way to sustain cooperation is the mechanism of indirect reciprocity, which is not just about repeated games, but concerns interactions within a network of individuals based on their reputations (Nowak & Sigmund 1998, 2005). One player will cooperate with the other party only if they have a sufficiently strong reputation for cooperating (Sugden, 1986; and Alexander, 1987). Nowak and

Sigmund explain the mechanism of indirect reciprocity and how cooperative individuals can prosper in a networked population. While direct reciprocity is based on the concept of «You scratch my back and I scratch yours», indirect reciprocity is based on the logic of «you scratch my back and I scratch someone else's» (Nowak & Sigmund 2005:1292).

Experimental and theoretical studies show that human beings display a high degree of cooperation with non-relatives (Fehr & Fischbacher, 2003). Such cooperation is based on moralistic emotions (for example, the anger directed towards cheaters or the “warm inner glow” felt after behaving in an altruistic way) and it gets sustained by a group mechanism under certain conditions (Milinski *et al.* 2002, Panchanathan and Boyd 2003, 2004, Nowak and Sigmund 2005, Nowak 2006). Indeed, individuals not only feel strongly about direct interaction with other parties but they also judge the behaviour of third parties, as evidenced by what is said in gossip (Wedekind and Milinsky 2000). However, indirect reciprocity is a mechanism requiring rigorous conditions that are absent in many interactions. For example, several simulations depend on reliable and adequate information in order to build up and maintain reputation. As a result, defectors make the group vulnerable to their invasion when there is incomplete information. Such an invasion takes advantage of other people's goodwill, thereby swamping the group (Uchida and Sigmund 2009).

Some experiments analyse how a small number of players may act strategically to create a cooperative reputation (Engelman and Fischbacher, 2009), finding that strategic players outperform non-strategic players and non-reciprocating players also outperforming reciprocating players. These findings throw evolutionary explanations for indirect reciprocity into doubt. In other words, it seems that indirect reciprocity cannot explain the evolution of cooperation. The outcomes achieved vary significantly according to the selected specific assumptions.

Thus far there is sufficient evidence enabling us to distinguish one set of theoretical propositions from others. However, the focus of this thesis is direct reciprocity.

4. Biological inheritance and the social *embeddedness* of prosociality

Where do prosocial preferences and beliefs come from? According to a number of experiments conducted in several different countries (Roth, *et al.*, 1991, Henrich *et al.* 2001), they emanate from culture. Some experiments which use children as subjects show that social motivations are created through socialisation and the internalisation of norms (Durkheim 1951, Benedict 1934, Mead 1963, Parsons 1967, Grusec and Kuczynski 1997). Such a process consists in the transmission of values and objectives from an older generation to a younger one through repeated personal interactions, based on a complex interplay of affect, authority and a distinctive psychological predisposition. The hypothesis that altruistic dispositions are products of the cultural environment is supported by solid empirical evidence (Enrich 2000). Altruistic disposition may depend on the various cultural environments within which they develop.

People's behaviour may be constrained by several kinds of social punishment, i.e. social disapproval or the power of others. However, the main problem is not to accept that individuals are influenced by culture, but to understand the origins and the formation of social norms. While some researchers argue that culture provides a sufficient explanation of social motivations and cooperation, others, instead, claim that this kind of cultural explanation is insufficient because it does not explain the origins of social norms. According to Hodgson, biology may support the cultural explanation because it helps us understand how culture originated and evolved. Given the importance of culture, Hodgson argues:

« before such a culture existed, it would be highly unlikely for a critical mass of cooperating individuals to become established. Any such emergent group would be highly vulnerable to invasion by free-riders, cheats or opportunists. A wholly cultural explanation cannot get off the ground » (Hodgson, 2012: 62).

Furthermore, social motivations and moral claims are a question of neither preference nor utility function since they have evolved over millions of years (Darwin, 1871) and are sustained by emotions (Mackie 1977, Joyce 2006). Their development does not simply depend on conformity to norms or conventions, but

is driven by emotion and unavoidable rules. For Hodgson, the moral nature of humans is thus a social phenomenon depending on social environment and biological evolution. Human beings are a social species, with emotional, linguistic and decision-making abilities. The origin of morality may be discovered if we go back to the history of our ape-like ancestors (De Waal 1996, 2006). Hodgson also claims:

«Both selfish homo oeconomicus and culturally-driven homo sociologicus are challenged by recent research. Human nature is not a tabula rasa upon which cultures write values and goals. Neither does society cohere simply on the basis of self-interest. No single discipline is able unaided to solve the problem of cooperation. Explaining human cooperation involves multi-disciplinary cooperation» (Hodgson, 2012: 64).

A further reason for considering the evolutionary explanations of prosocial preferences as well as the human predisposition to cooperate in particular circumstances is the evidence from the studies of the human brain that individuals are innately wired to care. Studies such as Tankersley, Stowe and Huettel (2007) have attempted to identify the brain centres associated with altruism. Other neuroeconomists such as Paul J. Zak (2004) argue that oxytocin levels in the brain are related to levels of trust. This analysis is supported by several studies analysing neural processes and pro-social dispositions (e.g. Fehr and Camerer 2007, Vercoe and Zak 2010). Furthermore, other studies analyse the areas of the brain which are associated with emotions. More precisely, they claim that the areas of the brain associated with moral judgments are not only those related to the pre-frontal cortex but also those that have evolved over millions of years (Green and Haidt 2002, Tancredi 2005).

Kin altruism (Hamilton, 1964) and reciprocal altruism (Trivers, 1971) are two important theories which explain pro-social human motivation. In 1964, Hamilton developed an evolutionary explanation for altruism among relatives, explaining the concept of “inclusive fitness” and expanding the basis of Darwinian fitness. The concept of fitness as « effective design for reproductive survival » (Williams 1966:158) is derived from Darwin and it is a probabilistic concept. Darwinian fitness is the likelihood that an organism will successfully reproduce by transferring their genes to future generations through direct

descendants. In other words, the “Darwinian fitness” of individuals may be defined as the expectation of their personal contribution to their descendants. If, instead, individuals of a species renounce their benefits for the advantage of other members beyond spouses and descendants, on average they would have fewer successful descendants. Thus, an inherited propensity for this behaviour would not permeate the entire population.

Hamilton’s (1964) definition of inclusive fitness concerns reproductive success, which includes close relatives who become ancestors of descendants with similar genetic material. More precisely, his explanation is as follows:

«Inclusive fitness may be imagined as the personal fitness which an individual actually expresses in its production of adult offspring as it becomes after it has been first stripped and then augmented in a certain way. It is stripped of all components which can be considered as due to the individual's social environment, leaving the fitness which he would express if not exposed to any of the harms or benefits of that environment. This quantity is then augmented by certain fractions of the quantities of harm and benefit which the individual himself causes to the fitnesses of his neighbours. The fractions in question are simply the coefficients of relationship appropriate to the neighbours whom he affects.»
(Hamilton, 1964:8)

Thus, Hamilton provides the rule by which the indirect fitness of altruistic individuals can be determined, and explains how altruistic traits (for example, helping relatives) leads to more offspring being born. In practice, inclusive fitness is very difficult to measure scientifically, which weakens the theory (for the lack of precise measurements of Hamilton’s rule see Gadagkar, 2010).

Maynard Smith (1964) analyses another mechanism, known as “kin selection”. Natural selection works mainly within the gene pool. A gene disposing a person to be altruistic or unselfish - even if there was a cost or risk for that individual - gets selected only when altruistic behaviour enables enough relatives to share the same genes. More precisely, an individual would risk their life to save at least two of their siblings in order to avoid the reduction of the frequency of their genes in the whole population. Several studies develop Hamilton’s calculation by providing considerably more detailed conditions (see for example Dawkins, 1979). This theory of kin altruism is one of the most important

explanations why many animals look after their young, and why humans take care of their family. However it is unable to demonstrate why cooperation, generosity and reciprocity are developed in large social groups (Frank 1988, Field 2001, 2007, 2008, Henrich 2004).

More than 30 years ago Axelrod and Hamilton (1981) proposed a theory developed by several computer-based models of the Iterated Prisoner's Dilemma (IPD) that were used to analyse the evolution of cooperation via Reciprocal Altruism (Trivers, 1971). In their article, they explain the evolution of cooperative traits and specify that when relatives are the beneficiaries of altruistic behaviour, cooperation can evolve through inclusive fitness, and when non-relatives are the beneficiaries, cooperation can evolve through reciprocal altruism.

Some studies (Trivers, 1971) provide some biological examples (for example warning calls in birds) in order to explain how natural selection could lead to cooperation between unrelated individuals. Reciprocal altruism (also called "weak reciprocity" or "tit-for-tat behaviour") is an additional gene-based explanation. It argues that individuals act in an altruistic manner only if there is a sufficiently high probability that this behaviour will be reciprocated (Friedman 1971, Trivers, 1971, Axelrod and Hamilton, 1981). According to the "Folk theorem", reciprocal altruism may foster a stable evolutionary equilibrium (Rubinstein, 1979, Fundeberg & Maskin 1986). When interactions are repeated over a long time, interacting individuals influence each other's fitness. In a social group with repeated social interactions, if the long-term amount of punishments is higher than the short-run rewards deriving from defection, then best choice for an individual is to cooperate. Thus, showing that reciprocity is an equilibrium depends on the strong probability that individuals will repeat their interaction. While kin groups may provide this critical mass (Trivers 1971), in large groups the probability of meeting the same person again is small. In other words, reciprocal altruism may explain the evolution of cooperation between neighbours in small societies, but it is not a sufficient explanation in large communities.

Many experiments (for example see, Bowles 1998, 2004, Field 2001, Fehr and Fischbacher, 2002,) have been carried out in order to explain prosociality in large groups. "Social preferences" may go beyond kin and other small groups and may be explained in terms of biological inheritance (Field 2001, 2007, 2008). In other words, altruistic dispositions have a cultural embeddedness, but they have also a biological foundation. The evolution of cooperation may be explained by

the mechanism called genetic group selection (cfr. Bowles, S. and Gintis, H., 2005). Group selection operates by the same rules as individual selection except that this mechanism is related to a process of natural selection favouring group characteristics, and identifies the fitness of one group relative to other groups. Trait group selection may be used to indicate the ties between two or more individuals, which in themselves represent a mechanism of differential survival (Wilson, 1980). Price (1970, 1972) argues that the effects of natural selection on gene distribution could be portioned into “group-level” and “individual-level” components.

Henrich (2004) has used a variant of the Price equation to analyse the differences between genetic group selection and cultural group selection. Whilst the former identifies genes as the source of variation, the latter explains how cooperation may arise from biased cultural transmission of behaviour in the sense that habits, social norms and cultural mechanisms are the causes of variation. Following Hodgson (2012), who analyses Henrich (2004) and the studies developed by Hull (1988) and Dawkins (1976), the main difference between the two types of group selection can be identified as the different type of replicator. In both mechanisms, groups are the interactors, but in genetic group selection the replicators are the genes whereas in cultural group selection the replicators are socio-cultural factors such as habits and organisational routines (Aldrich *et al.* 2008). Furthermore the functioning of the two mechanisms depends on factors such as the impact of migration. Genetic group selection requires migration to be limited, and works with a small variation. Conversely, cultural group selection works even though the group may be invaded by a large number of immigrants that increase the variation within the group (Boyd and Richerson 1985, Henrich 2004).

As Hodgson (2012) states, there is no complete evidence that genetic group selection of prosocial disposition has occurred:

« Overall, the evidence we have from primates and contemporary hunter-gatherers undermines genetic group selection as an explanation of the origins of cooperation. But the question is still open because evidence on primates or humans today is not evidence about prehistoric humans » (Hodgson, 2012: 70).

Thus, it can be seen that an adequate explanation of prosociality requires both biological and cultural explanations.

5. Conclusions

Humans are not only self-interested but can also act prosocially and are concerned with “doing the right thing” even when it may be against their own interests. Individuals have evolved over a long period of time as social beings who accept the rules of their community, have ethical feelings, beliefs and respect authority. Furthermore, they behave according to moral principles, and sympathy and true generosity are strong reciprocators. They are affected by the social environment, which enables the education of individuals and influences the development of their social preferences. Moreover, social motivations are partly developed within a cultural setting and are partly inherited (Simon, 1990). The evolutionary origins and persistence of prosociality can be explained by genetic mechanisms such as inclusive fitness, kin altruism or genetic selection-group.

Thus, social motivations are the outcomes not only of human enculturation but also of a long evolutionary process: culture is vital for the development of prosociality, but so too are genetic mechanisms. Following Darwin’s ideas, Hodgson argues:

« Yet much of mainstream economics, even when it predicts correctly, lacks a causally plausible and informative account of human motivation that is grounded on our understanding of human evolution. Evolution has to be a vital guide, additionally informed by our knowledge of social relations and culture. When we make assumptions about human agents we are required to ask how possibly they could have evolved and have had a survival advantage for our species. Taking account of this point involves a major challenge to much of existing economics and leads to its rebuilding on evolutionary foundations » (Hodgson, 2012: xi).

Any useful reference to human evolution is absent in mainstream economics, to explain the model of *homo oeconomicus* used to analyse how people behave in strategic situations. Furthermore, *homo oeconomicus* aims at

material self-interest and would never act in reciprocal manner. However, many economic experiments show that cooperation, human altruism and reciprocity are important, thus contradicting the theoretical predictions of mainstream economics. An alternative model is *homo reciprocans* who is capable of intrinsic motivation and behaves in reciprocal manner on the basis of preference for reciprocity. He has a moral code and social motivation formed in the interaction process with other individuals. *Homo reciprocans* is culturally driven and genetically programmed to trust others and to be cooperative. Such trust and cooperation is based not only on material incentives but may be fostered by social preferences such as reciprocity.

Reciprocity is an important kind of social preference and occurs when individuals behave in a kind way in response to the cooperative action of others, and when they act in an unkind manner following hostile treatment by others. Trust based on reciprocity does not necessarily follow calculative reasoning, but is also based on informal rules. The analysis of the institutional context of organizations may help us to understand how such rules limit individual's behaviour, affect social motivations and shape human interaction.

CHAPTER 2

Reciprocity and the Gift-Exchange Game

1. Introduction

David Marsden opens his book on “A Theory of Employment Systems” with the observation that one of the great innovations behind the rise of the modern business enterprise is the employment relationship. He argues that:

«the key to the employment relationship is that it enables management to decide detailed work assignments after workers have been hired. Given the huge difficulty of anticipating the problems to be resolved in providing customers with the goods and services they desire, such flexibility is a formidable advantage» (Marsden, 1999: 3).

To summarise, the benefits of employment contracts over sales contracts for employers and workers are threefold. Employers gain flexibility and know that work will be available when they know more precisely what their work needs will be. Employees gain by the continuity of activity, which is a useful advantage when their principal source of income is the sale of their work. Finally, both sides benefit by substituting a single transaction for what otherwise would have been separate transactions.

The employment relationship is about more than an exchange of work for money. At the time the contract is made, workers do not know the specific details of the performance required by the employer. Furthermore, the employer pays a wage in order to have the option to postpone defining the terms of the contract until later. In other words, given the difficulties of precisely defining the terms of contract in an uncertain context, the possibility of the employer progressively specifying the appropriate behaviour required from the worker as more complete information becomes available is a substantial advantage in the employment relationship.

However, employers are unable to ascertain the true productivity of workers. In general, workers will have more detailed knowledge of work tasks. In the employment relationship, opportunism originates from the absence of a clear

definition of the range of tasks over which the employer's authority extends, and regarding which tasks the employee will agree to undertake (Marsden, 1999). In such a context of asymmetric information, if workers are selfish they will choose their minimum effort level.

In reality, individuals are not only "calculators" of pleasure and pain, but they can also be trustworthy. They vary in decency, fairness and moral commitment, and these variations can provide a basis for cooperative economic relations. Furthermore, they are reciprocators and act according to social norms. By reciprocity between employer and employee, this study means the predisposition in the institutional context of a defined employment task, cooperation with the other party even at personal cost, and a willingness to punish the other party if they violate cooperative norms, even when the punishment is personally costly. Reciprocity is an important contract enforcement device where incomplete labour contracts exist (Akerlof, 1982; Akerlof and Yellen, 1990).

In order to understand the effects of different governance devices and empirically verify these propositions, it is necessary to carry out some economic experiments. By using different experimental groups in different treatments characterised by different transaction rules, the role of economic incentives and of alternative motivators such as reciprocity can be analysed. Economic experiment is thus an important instrument for investigating how the open-ended employment relationship may be managed and how different corporate governance patterns may give different degrees of flexibility, provide protection against opportunistic behaviour and offer a stable basis on which cooperation between manager and workers may develop.

In particular, experimental evidence shows that people are motivated not only by selfish motives, but also by social mechanisms such as reciprocity (Fehr *et al.*, 1993; 1997; Fehr and Falk, 1999; Fehr and Gächter, 2000; Falk and Gächter, 2002; Croson, 1996; Guth, Klose, Königstein and Schwalbach, 1998; Keser and Winden, 2000). The concept of reciprocity as a source of spontaneous coordination is analysed in the gift-exchange game (both in the one-shot and repeated game versions). It analyses the emergence of spontaneous coordination as a result of an interactive process based on social values and preferences such as reciprocity. In particular, this chapter explores the contractual paradigm provided by Williamson (1975) and then offers an alternative approach to the employment relationship.

2. Opportunism in the Employment Relationship

Employment contracts are incomplete in the sense that they stipulate a fixed or variable wage without specifying the details of the individual worker's tasks, which are left to be determined by a managerial authority. This incompleteness allows firms to have flexibility in their employment relationships. It also saves costs because, as Coase (1937) observes, a single, flexible transaction is substituted for a multitude of separate transactions for each service required by the firm (*ibid.*). Nevertheless, this incompleteness provides scope for opportunistic behaviour by either party with regards to the employment contract. In particular, “motivation problems arise only because some plans cannot be described in a complete, enforceable contract” (Milgrom and Roberts, 1992: 127) and, given the assumption of the bounded rationality of the parties, the authority relationship inherent to the employment contract does not fully resolve the problem of opportunism (Williamson, 1985).

Indeed, for Williamson, opportunism is the central feature of the model of the economic agent and trustworthiness is redundant. He argues that:

«there appears to be developing a general consensus» that «opportunism is a central concept in the study of transaction costs» (Williamson, 1979: 234)

Williamson (1975) used the notion of «atmosphere», and recognised the effect on transactions in the wider context where they are embedded, but the nature and workings of this context are not analysed. In his 1993 article, he explicitly tackles the notion of trust, and he claims that if trust does not go beyond calculative self-interest then it is redundant in transaction cost economics (Williamson, 1993).

It is possible to define four areas of possible opportunism in which workers and firms would derive benefits from the employment relationship. Marsden (1999) summarises them as follows:

The area of “job boundaries and work allocations” concerns the control of work assignments. Employers may attempt to impose additional tasks.

Alternatively, workers might seek to improve their job prospects on the basis of other group tasks.

The area of “continuity of employment” concerns two major sources of opportunism and employment conflict. They may be distinguished in the use of task reallocation to cut jobs and in the use of restrictive job definitions to restrict certain labour tasks.

“Task variability” and “unusual tasks” generally occur as unexpected production problems or demand emergencies (Koike and Inoki, 1990). Their quantitative importance is hard to measure, but a number of job experts have long argued that they are becoming increasingly important as “routine tasks” become embodied in technology (Davis, 1971; Lawler, 1994), and as workers have to react more frequently to remaining, unanticipated problems. Their significance is now widely acknowledged. They can be a positive source of problem-solving activities, and hence of incremental improvements in workers’ skills, productivity and quality (Koike and Inoki, 1990). However, they can have a negative effect because of information asymmetries, and so threaten management control even in environments where workplace unionism is weak.

The last kind of opportunism that may arise from the employment relationship concerns the “recognition of skills” applied on the job which may establish conditions under which experienced employees will agree to “transmit their skills” to new employees. Both of these need to be resolved if workers’ competencies and employers’ job demands are to evolve together over time. However, if the nature of the skills developed is difficult to define, and the employer refuses to recognise them, workers may find it difficult to defend their skills progression.

To solve these and other kinds of opportunism and hazards, transaction cost economics elaborate various farsighted responses. One such response would be to decline to engage in these transactions in favour of shorter, simpler transactions. A second would be to modify the price of the complicated transaction to reflect the additional hazards. A third and more elaborate solution would be to define ex

ante safeguards (credible commitments), the effects of which are to mitigate opportunism.

Williamson (1996), in his article on “Efficiency, Power, Authority and Economic Organisation” argues:

«This last is to be contrasted with Machiavelli, who also subscribed to opportunism but viewed contracting myopically. Thus, whereas Machiavelli advised his Prince to breach contracts with impunity –get them before they get us – transaction cost economics advises the Prince to devise (give and receive) credible commitments. Not only will the latter deter inefficient breach, but it encourages investment in productive but otherwise risky assets and supports greater reliance on contract (as against no trade or vertical integration). Farsighted agents who give and receive credible commitments will thus outperform myopic agents who are grabby» (Williamson, 1996:19).

According to Williamson, power, contractual safeguards, prices and efficiency play an important role in long-term transactions. Transaction cost economics focuses mainly on organisations which have formal rules, contracts and efficient governance devices. Instead, this thesis attempts to demonstrate that considerations of trust (based on the perception that the other party is inherently trustworthy) and reciprocity are critical to an adequate theorisation of the relations between employer and employees within the firm.

The employment contract, as an incompletely specified contract, can foster trust within a relationship, characterised by the fact that the administrative process enables a compromise to be negotiated between the aims of the two parties. Thus there is a reciprocal benefit in postponing the definition of commitments; there is a “liquidity preference” which the two parties express within the employment contract, both in the event of “contingencies” and in dealing with the problem of the interdependence between reciprocal actions. Under certain circumstances and on certain occasions, people use ingenious kinds of contracts to demarcate the boundaries of rationality in everyday transactions (letter to Williamson, September 29, 1993, see Auzier and March, 2001). This may explain why the employment relationship is attractive to managers. It is a common example of procedural rationality, enabling them to organise production and services without

complete information about future labour needs, particularly when there is uncertainty about the precise tasks that will need to be accomplished.

The employment contract includes the agreement of the employee regarding their willingness to accept the authority of an employer in exchange for a wage. Authority is described as the employer's right, within limits, to determine a set of specific actions that the worker must perform, i.e. their behaviour (Simon, 1951). The employer and the employee agree a set of tasks from which the former may choose once the contract has been signed. Thus, the employment contract may be defined as the possibility of identifying a zone of acceptance comprising a set of possible behaviours to which the employee is indifferent, with respect to the decisions made by management; it is the who pays for the advantage of postponing the terms of contract (Simon, 1951). In a context of uncertainty, the most important benefit of the employment contract is that it is «advantageous to postpone a decision... in order to gain from information obtained subsequently» (Simon, 1951: 304). The employment contract indicates a preference for liquidity on both sides: the employer can indicate the most appropriate action required from the worker after the stipulation of the contract, and the worker finds it advantageous for their behaviour not to be completely fixed. It is possible to derive from this that employment contracts are better than sale contracts. The most advantageous conditions are found inside the firm.

The next sections explore a range of different factors, such as loyalty and commitment, which potentially limit opportunism. However, they will take us beyond assumptions based primarily on opportunistic behaviour (Simon, 1991) and they will allow us to explore concepts such as trust and reciprocity and other important elements in the development of cooperative workplace relations. Concepts such as trust and reciprocity must be regarded as important elements in the development of cooperative workplace relations.

3. Tit for Tat strategy vs Reciprocity

The previous section has explained how the incompleteness of the employment contract creates scope for opportunistic behaviour by either party in the employment relationship. According to Williamson (1985), managers and employees have a conflict of interest. Given the assumption of the parties' bounded rationality, the employment relationship does not fully solve the problem

of opportunism. In transaction cost economics, self-interested actions have received considerable attention within the company. Furthermore, organisations are viewed as a “nexus” or “network” of contracts. This model is one that could be called an "opportunism core model", or one which is based solely on opportunism. Williamson further argues that trust as a category is irrelevant in economic transactions, calling it "redundant" (Williamson, 1993). In the same article Williamson sought to clarify the growing literature on trust in economic relationships. Most of this literature concerns calculated risk. That is, with contracts being incomplete, there is a possibility that the agent does not fulfil the contract, thereby causing losses. In the literature, mechanisms are analysed to make the agent act in observance of the contract. He argues that a common mechanism envisaged is the design of incentives in the contracts to encourage trust. He goes on to say that this is unnecessary because such transactions can be explained in terms of calculated risk, and so it is confusing because it refers to a different kind of relationship and it is inappropriate to economic relationships in which gains are maximised.

Williamson (1993) argues that calculated risk cannot be thought of as trust. Therefore, he uses the concept of “personal trust” to distinguish this concept from trust as a calculated risk. He states that, without doubt, personal trust exists, but that it is irrelevant in economic relationships. When an agent trusts the other economic party, it is akin to inviting exploitation, since the world of commerce is dominated by cynical behaviour rather than innocence. (Williamson, 1993). The relevance of personal trust is thus limited to the world of family, friends and lovers. This kind of trust should be considered as disinterested and not calculative because agents are prepared to incur costs without any compensating gain. In other words, Williamson sees calculative risk as being incompatible with personal trust because it transforms the relationship into an instrumental one. Williamson (1993) describes trust relationships as being characterised by the absence of monitoring, a propensity for forgiving predictions and discretion, that is to say that the relationship is not subject to market incentives.

Williamson (1993) refers to Dunn’s concept of trust as a human passion because he seeks to describe a relationship based on mutual trust where each individual believes in the good intentions of others, and where he considers the other’s behaviour to be friendly, favourable and helpful. In this case, each individual in the relationship rejects the option to monitor and control the other’s

behaviour. He cites Nozick's description of Love's Bond as an example of such a relationship, and as an explanation of the existence of this kind of satisfaction. In a loving relationship, people seek to create an "us" and to extend their self in order to take their partner into account. As a result, in such special relationships, the action of one of the partners does not have the same meaning, value or impact than in a relationship where the self of individuals is not extended. Thus Williamson (1993) argues that in economic relationships, trust as a human passion (personal trust) is superfluous and he (1995) analyses a particular kind of satisfaction:

«Also pertinent is that individuals keep informal social accounts and find the exchange of reciprocal favors among parties with whom uncompensated spillovers exist to be satisfying (Gouldner, 1954). Transforming these casual social accounts into exact and legal obligations may well be destructive of atmosphere and lead to a net loss of satisfaction between the parties. »
(Williamson, 1995: 232-233).

This satisfaction comes from the output of transactions, which may be embedded in relationships between transaction partners. They characterise a special relationship in which reciprocal favours are exchanged. The relationship is valued in itself, and not only for its output.

Particular categories of action, special kinds of satisfaction and the norms of reciprocity (analysed as a set of feelings and beliefs about social) have been studied by Gouldner (1960). The norm of reciprocity is based on two simple principles: 1) helping those who have helped you; 2) not injuring those who have helped you. If the norms with these principles are internalised, then acting according to them creates positive feelings and pleasure. However, even if the concept of internalisation is not accepted as a theoretical explanation, we may instead believe that it feels good to be one of the parties in a mutual relationship.

According to Williamson (1993), if people are able to identify their partner as part of their extended self, then they can value relationships in themselves and they are able to ascribe safe intentions towards another person. However, he further argues that agents in economic relationships are mainly characterised by an invariant opportunism model. Furthermore the concept of atmosphere in the firm described by Williamson is still a long way from the concept of personal trust

and reciprocity. In transaction cost economics, it is assumed that economic agents are simply opportunistic and trust can be based only on the perception that the other party will cooperate because it is their interest to do so. The notion of trust in transaction cost economics is close to the concept of reputation, and depends on the characteristics of the situation (Noorderhaven, 1996). Agents guard their reputation because it influences future trading opportunities, and it has this influence because agents guard it (Kreps, 1990; Axelrod, 1984).

In contrast, in this thesis the other party may be inherently trustworthy and may discharge the fiduciary obligations and responsibilities taken on by an expression of commitment. In such cases, trustworthiness is identified as a disposition to live up to both the explicit and implicit commitments expressed by written or oral communication respectively, or by merely being present at a specific place and time. These commitments are a product of a complex, non-linear interaction process that is “history-dependent”. Thus, economic agents are not only opportunistic, but are also inherently trustworthy and vary in decency, fairness and morality; these variations presumably lead to differing levels of trust. Moreover, trust has been defined as accepting risk, vulnerability and uncertainty, as well as a subjective probability that something will not go wrong (Dasgupta, 1988; Mayer, Davis and Schoorman, 1995).

Commonly, the social contract relies on unspecified implicit obligations between people, depending on shared systems of meaning, belief, and ethics. Economic exchange includes non-contractual elements, and trust may be based on reciprocity. This kind of trust emphasises the relationship between trust and relational investment and lies primarily in the anthropological and sociological meanings of reciprocity (Blau, 1964; 1994).

Williamson introduces Gouldner’s (1954) attempt to explain whether reciprocity is important in social life and how it is related to the purely economic model of exchange. In particular, Gouldner seeks to understand whether the impact of the norm is similar in different cultures, and whether the norm is operative in every instance of an interaction. He explains how in some countries, such as the Philippines, all relations are affected by this norm, which is also endemic in other countries such as the United States and other market societies. In these countries, the norm does not characterise all the dominant culture, but is enforced by friendship, kinship and neighbourly relations. It is also found in institutionalised and rationalised sectors. Furthermore, he argues that if there is a

lack of reciprocity, some compensatory mechanisms such as the concepts of “noblesse oblige” and clemency may make a relationship stable and coercive.

Gouldner (1954) attempts to introduce reciprocity in the economic model and economic relationships. A purely economic or utilitarian model cannot explain how all economic transactions begin and function. The norm of reciprocity may stimulate economic transactions by offering grounds for confidence that the person who invests in advance will be repaid at a later date. Certainly, if both Ego and Alter are obliged to repay a benefit received and know that the other is also obliged, there will be less indecision in initiating the transaction. Another important reason for beginning a relationship is the special satisfaction people have when involved in this kind of reciprocal relationship.

As a result, the conclusions reached by Williamson and Gouldner are diametrically opposed. For Williamson (1993), trust is irrelevant for market transactions and is applied exclusively to interactions between family, friends and lovers, whereas for Gouldner (1954), trust is necessary for market transactions and is based on the norm of reciprocity which is applied in a wide array of interactions in all human societies. Thus, trust is provided by the reciprocity principle required for market transactions to take place. In contrast, reciprocity implies trust because each participant feels confident that they will be helped by the other in times of need. Individuals in reciprocity relationships are reactive to each other's needs, and understand this component of the relationship. They are confident and feel included in the extended self of the other party who wants also to share values, principles and concerns that might arise. Trust is implied by reciprocity because it involves not only an appraisal of a partner's reliability, but also the belief that partners have concern for one's needs and can be counted when required, and that they feel confident in the strength of the relationship (Rempel *et al.*, 1985). According to many social scientists, other concepts such as justice (or fairness), morality and altruism, are also implied by the “reciprocity complex” (de Vos and Wielers, 2003).

Williamson and Gouldner's divergent views about the reciprocity principle can be summarised in the following way:

- According to Williamson (1993), the market is dominated by cynics and self-interested individuals who do not trust each other and only calculate the risks of the transactions that they face. The only type of reciprocity compatible with Williamson's approach is the economic concept of tit-for-tat strategy

developed by Axelrod (1984) in his computer tournaments.

- According to Gouldner (1954), it is difficult to begin and develop transactions if individuals are exclusively interested in the anticipated gratification of the net return of such transactions. The concept of reciprocity here is different from the economic concept of Axelrod's tit-for-tat strategy. In real economic transactions, people trust each other and gain satisfaction from being involved in reciprocal trust relationships.

4. Opportunism and Reciprocity in the Gift-Exchange Game

Experimental evidence shows that people are influenced not only by selfish motivation, but also by the norms of reciprocity (Fehr *et al.*, 1993; 1997; Fehr and Falk, 1999; Fehr and Gächter, 2000; Falk and Gächter, 2002; Croson 1996; Guth, Klose, Königstein and Schwalbach, 1998; Keser and van Winden, 2000). For these authors, in the presence of incomplete labour contracts, reciprocity is an important contract enforcement device (Akerlof, 1982; Akerlof and Yellen, 1990). In particular, Fehr *et al.* (1993) present a version of the gift exchange game that they use in order to test the potential role of reciprocity in employment contracts. This basic version of the game investigates the empirical importance of reciprocity through a two-player sequential move game consisting of two stages. In the first stage, a "firm" offers its "worker" a wage w . In the second stage, the worker can either accept or reject the offer. A rejection ends the game and results in zero profits for both players. Upon acceptance, the worker has to choose the effort level e . The higher the effort level, the higher the associated effort costs, $c(e)$. The second stage is completed after the manager has been informed of the employee's effort decision.

Subjects were randomly assigned to the roles as "employers" and "workers", respectively, and kept their role throughout the experiment. There were an identical number of workers and firms. Procedures and payoff functions were known by all the players, i.e. they were explained in the instructions provided by the experimenter. The employer's earnings decrease as the effort (e) decreases, and increase as the wage (w) decreases, whilst the worker's earnings increase as w increases, and decrease as e increases.

We can generalise a sequential game in two moves in which a manager makes a salary choice between 20 and 120 and an employee makes a choice of effort

level between 0.1 and 1, or alternatively they may decline the offer.

In the one-shot gift-exchange game, the “standard prediction” under the assumption of common knowledge of rationality and selfishness is easy to derive with backward induction. Since effort levels above the minimum are costly and workers are the second movers in this two-stage game, they will choose the minimum effort level. A firm’s best response is to offer the lowest wage to a worker. We call these reference outcomes w^* and e^* , respectively. The resulting equilibrium payoffs are less efficient than those of more cooperative play. Thus, there is a significant possibility for cooperation in order to achieve joint improvements. Expressed in non-mathematical terms, this represents the “total distrust” of the worker, or an expectation of minimum effort. In other words, the employer believes that his worker will always offer the minimum effort level no matter what salary is offered. On the basis of these expectations the employer will offer the minimum salary (w_{min}). It is simple enough to imagine that the worker will react by working at the minimum effort level (or even refusing the offer) thus proving that the orthodox theory hypothesis is true. The lesson one learns from this is that where there is total distrust, low earnings are realised.

Although some economic transactions are similar to the anonymous one-shot games studied above, many employment contracts are clearly different. They do not occur only once, as in the one-shot version of the gift-exchange game. In labour relations people interact repeatedly, which provides many opportunities for reciprocation, reputation formation, and social exchange. The mix of social motives and economic incentives to cooperate may actually have interesting effects on interaction. Some people, even those who are totally selfish, may have an economic incentive to cooperate. Consequently, it is very important to understand how subjects behave in repeated interactions. The most important question is whether the mere fact of repeated play can actually help to solve the efficiency problem. The experiments provided by Falk and Gächter (2002), which is a version of the gift-exchange game created by Fehr *et al.* (1993), directly address this question in the context of the gift exchange game. As mentioned above, in this type of game the baseline treatment was a so-called “One-Shot treatment”, which is a sequence of one-shot games played in each period by different worker-firm pairs. In the second treatment, each pair plays ten repeated versions of the same game. In this “repeated game treatment”, since the participating pair has a common history, repeated game effects are possible. In the

repeated game, Falk and Gächter (2002) investigate the empirical importance of incentive contracts and long-term contracts, i.e. repeated interactions.

In the repeated gift-exchange game with definite time, it is difficult *ex ante* to have a specific theoretical prediction. If there is only a small probability that the adversary is, for example, a “tit-for-tat” player, cooperative play can be supported until the final period (Kreps *et al*, 1982). Furthermore, even with complete information but multiple equilibria in the stage game, cooperative equilibria exist wherein wages and effort above w^* and e^* are observed for all but the last period (Benoit and Krishna, 1985). Boundedly rational players may also take repeated game effects into account (Selten, 1978; Selten and Stoecker, 1986). These sources suggest that wages and effort levels at least as high as w^* and e^* can be observed. A “repeated game effect” can therefore be defined as the difference between observed behaviour in the repeated treatment (RG) and the one-shot treatment (OS).

In summary, an opportunistic core model would predict a flat line around the minimum wage and minimum effort in the one-shot version of the game. This prediction is similar to those of the traditional prisoner’s dilemma. Furthermore, there may be a bit of tit-for-tat strategy in the repeated game, which would differentiate it from the one-shot game. This would show up in the behaviour of the final round.

Fehr’s research has shown that many people are motivated by reciprocity and that w^* and e^* are not usually the observed outcomes in the one-shot version of the game. The most obvious result of the experiments is that both average wages and effort levels clearly exceed the levels predicted under opportunistic behaviour, meaning that compared to the reference outcome (w^* , e^*) there is strong and systematic deviation. This deviation is persistent across all periods.

« Hypothesis: Wages and effort levels are positively correlated, i.e., $\text{corr}(w, e) > 0$ holds » (Falk and Gächter, 2002: 6)

If employers pay “generous wages” ($w > w^*$) and employees reciprocate by providing higher levels of effort ($e > e^*$), both trading partners greatly improve their payoffs compared to the subgame-perfect play.

Efficiency is increased considerably relatively to the reference outcome. Thus reciprocity is capable of supporting cooperative play, thereby ensuring mutual

benefits. In the version of the game provided by Falk and Gächter (2002), this hypothesis, in a multiple one-shot gift exchange game, is confirmed by the experimental results (tobit regression results). This means that reciprocity matters. Furthermore, in such a game the potential role of reciprocity is tested by the experimental results (tobit regression results) in a repeated game. More precisely, one can deduce from this that human behaviour is characterised by a positive level of trust based on reciprocity but not blind faith. Instead, rather more sensibly, we should expect the employer to have a more positive outlook regarding the behaviour of their workers, and that a level of effort which increases in proportion to the salary offer will be obtained. In other words, they expect the worker to reciprocate their generosity and be more willing to work the higher the salary offered.

The employer may reasonably expect a constructive correlation between w and e . However, the employer does not know the worker's reply in advance, meaning they can only guess. This lack of coordination, which is also a lack of knowledge of the preference function of the other, does not always allow higher profits to be achieved. One of the aims of this research is to understand why this does not always happen and to discover how his problem might be mitigated. The main problem lays in the fact that it is difficult for the employer to know the worker's response in advance, that is, the extent to which (or indeed whether) they will reciprocate. It is also possible that in the course of a game the parties may have the chance to get to know each other better, and to learn how to manage their relationship and send each other signals.

Comparing the repeated game with the one-shot game makes it possible to separate the impact arising from the cooperation of a repeated interaction with the same opponent from the impact of a pure reciprocity effect. Hence, the change in reciprocity in the RG treatment relative to that observed in the OS treatment determines the extent to which reciprocal behaviour is altered by some repeated game effects.

As in the OS treatment, both average wages and effort levels exceed the subgame perfect levels in the RG treatment, meaning that compared to the reference outcome ($w^* = 21$ and $e^* = 0.1$) there is a strong and systematic deviation which is persistent across all periods. These data show the importance of both reciprocity and repeated game effects. Wages in all periods are similar between the two treatments, and reciprocity is relevant in their experiment. This

said, workers' behaviour is more cooperative in the RG treatment, which shows higher effort levels. In both treatments, they find subjects who are motivated by reciprocity. Moreover, the repeated game nature of RG treatment has the effect of disciplining some selfish people who would, in the absence of repeated interaction, play uncooperatively, as in the OS treatment.

Furthermore, there is an "endgame effect", i.e. a considerable drop in effort levels in the final period. Although wages did not fall (it does not result in effort levels of e^*) the average effort fell to around the levels of the one-shot game (which was on average $e=0.41$). Average effort levels in period 10 of the RG treatment are (a) lower than in period 9. The relationship here is thus seen primarily in economic and social terms. The parties involved in the agreement are motivated not only by the economic incentives of the game, as described above, but may also be influenced by relational motivators and customs which may alter their way of interpreting external relationships with other companies. However, reciprocity may increase the risk of exploitation by each party and so make the employment relationship more unstable. When the employment relationship is not long-term, reciprocity may not be sufficient to effectively co-ordinate expectations and interactions between managers and workers (Nooteboom, 1996).

Given the intrinsic features of such relational mechanisms, it seems that employer and employees who consider this device as a possible basis for their interaction tend to seek reasons why the risk of trust will not exceed a certain limit. Relationships based on reciprocity can never be built on complete information since it would make them superfluous, yet they do require the environmental and institutional factors on which they rely (Zucker, 1986; Reed, 2001).

5. Conclusions

Employment contracts differ from conventional sales contracts because they do not specify the terms of action of the two parties. The workers do not promise to perform a specified set of tasks, instead agreeing to accept the authority of their employer in exchange for a wage (authority is defined as the employer's possibility of choosing from a set of specific actions which the workers must perform, i.e. their behaviour). Over time, the employer can define the meaning appropriate behaviour as more information becomes available. In other words, the

employment contract can be defined by the possibility of identifying an agreed zone of acceptance for the worker – an area in which the worker is disinterested in the choices made by others, and the employer pays for the privilege of postponing the terms of the contract. Given the complex and uncertain environment in which firms act, such flexibility is a considerable advantage. There are different methods that can be used to describe employment relationships.

According to Williamson (1993), in the social domain of market relationships, trust cannot be applied in a stable fashion because it would be immediately exploited by the opportunism and calculativeness of the other party. In transaction cost economics, Williamson (1975, 1985) argues that the employment relationship is founded on the premise that managers and employees have a conflict of interest and elaborate coercive authority incentive alignment mechanisms. Opportunism (self-interest seeking with guile) arises because some plans cannot be described in a complete, enforceable contract, given the assumption of the bounded rationality (limits in the acquisition and processing of information) of the parties. Nevertheless, he does not claim that all agents are opportunistic all the time, but he argues that the nature of different governance structures depends necessarily on potential or actual opportunism.

In summary, Williamson views the employment relationship in terms of efficiency and opportunism, which are the core of economic action, and considers trust to be redundant. This thesis, in contrast, attempts to demonstrate that considerations of trust and reciprocity are critical to an adequate theorisation of the relations between employer and employees within firms. In particular, the concept of reciprocity, as a source of spontaneous cooperation and as a significant contract enforcement device in the presence of imperfect labour contracts, is analysed by means of the gift-exchange game (Akerlof 1982; Akerlof and Yellen, 1990).

This thesis summarises some important experimental results regarding the role of reciprocity in employment relationships, and discusses the wider problem of how experimental findings fit into an evolutionary perspective on human social motives and emotions.

CHAPTER 3

Beyond The Gift-Exchange Game: The institutional Details of Reciprocity

1. Introduction

Reciprocity does not emerge in a vacuum, but is based on specific institutional arrangements representing a world of shared meaning and normative rules of behaviour within organisations. One conclusion which may be drawn from this notion is the importance not of reciprocity in itself, but of the impact of institutions (employment rules) on reciprocity.

Thus, reciprocity as a habit is justified by the opportunities and constraints arising from the institutional environment. Individuals have an incentive to act in a way consistent with social institutions regarding a selection process that helps those who have most interest and eliminates outliers. The institutional structures created must therefore influence behaviour so as to improve the performance of the individuals.

Institutional changes can modify individuals' habits of thought and behaviour as well as create new perceptions, preferences and intentions. In short, individuals form their habits on the basis of constraints imposed by institutions (see Hodgson, 1988; 2002; 2003). More specifically, institutions can be defined as those universally-accepted rules and guidelines that structure social interactions. Since they set limits on human behaviour, they reduce uncertainty. In other words, institutions are social structures that give individuals accurate expectations about the behaviour of others.

This chapter explains how, based on different combinations of employment rules and reciprocity mechanisms, two distinct patterns for controlling employment relationships can be identified: the rigid governance structure and the flexible governance structure. The rigid governance structure, based on specific rigid employment rules, provides an institutional framework sufficiently stable to build a secure agreement between companies and workers to cooperate. However, members of the company do not possess the discretion necessary to react swiftly

to changes in an uncertain environment. In contrast, the flexible governance structure attempts to build a more adaptable framework for stable collaboration between manager and employees. This approach focuses on the relationship between trust and informal flexible rules. In avoiding any direct connection to the tasks workers carry out, this structure provides a more flexible model of employment relationships, operating at an inter-personal level, and functioning most effectively when reciprocity mechanisms dominate the relationship.

2. Employment rules

Establishing trust based on reciprocity within an employment relationship is not always easy: it is not something which can be purchased by the pound. The problem of *reciprocity* is that it may take a long time to grow, and it may not be sufficient to co-ordinate the expectations between employment relationship parties, particularly in large and complex organisations. Some authors, such as Marsden (1999), have emphasised the role of impersonal transaction rules in the employment relationship in order to overcome these problems. These employment rules can be seen as governance devices in that they reduce transaction and production costs, increase flexibility by reducing the need for detailed contracts, and restrain the opportunism of the parties.

The employment contract may be identified as an institutional authority relationship where impersonal rules provide a framework for spontaneous co-operation between manager and workers. These rules provide potential solutions to the problem of unstable employment relationships since they limit both managerial authority and employees' freedom to act, as well as providing protection against opportunistic behaviour by either party. The rules that are included in the structural arrangements of the organisation limit individuals' behaviour by restricting their decisions. Consequently they emerge as a de-personalised institutional order (Lane and Bachmann, 1998).

Institutions can be defined as "the rules of the game" which affect a company's performance or, more formally, as the human-devised constraints that shape human interaction (North, 1990). To reduce uncertainty, institutions define and limit an individual's set of choices and diminish the transaction costs. They provide the framework within which human interaction takes place, and they are

similar to the rules of the game in a competitive team sport. The purpose of these rules is to define both the way the game is played and the objective of the players (economic agents) within these rules to win the game. In other words, such institutions are rules that reduce uncertainty (by establishing a stable, but not necessarily efficient, structure for human interaction) and affect economic performance through their impact on the costs of exchange and production (North, 1990).

Employment rules can be seen as governance devices in that they reduce transaction and production costs, restrain the opportunism of both parties and provide flexibility, due to the need for detailed contracts. As a result, they emerge as simple, de-personalised but legitimised institutional orders in that they are included in the structural arrangements of organisations, limit individuals' behaviour by blinding their decisions and enforce the employment relationship, changing its nature in the process. According to Marsden, such rules may be a more simple solution which enables both management and workers to identify the kind of tasks which are included in particular jobs. He argues:

«in the place of a complex list, there is a simple rule for allocating tasks; if the rules are sufficiently robust, they can be applied across a variety of workplaces; when they are known and understood by the parties, they give fairly predictable results and each knows what they are letting themselves in for; application of a rule also provides a key for settling disputes other than by naked power; and rules can be adapted logically to new situations» (Marsden, 1999: 17).

Thus, the employment relationship is effective if the employment rules follow two sufficient and necessary conditions, namely efficiency and enforceability. Efficiency means that employment rules must sustain job demands and worker competencies in order to improve production. In other words, they must be attractive, offering both parties the security and support of an employment contract (Marsden, 1999: 31).

Enforceability, meanwhile, means that employment rules reduce the employees' ability to shirk and protect them from an employer's request for flexibility. Enforceability concerns the transparency of task allocation rules, an

essential element of norms for limiting potential forms of opportunism, and hence for enforcing agreements. This may be achieved through two different ways of identifying job tasks: task-centred rules and function-centred rules. Task-centred rules build a specific relationship by defining the technical competencies of jobs and the precise attributes of the tasks. This is a simple and clear way of task identification but may also be a source of rigidity in task allocations. Function-centred rules create a less specific link between individual tasks and jobs by offering discretion and flexibility to employees. These norms favour employers because they can tailor jobs more closely to the final output desired.

Task-centred rules may be further sub-divided into two different types, each of which specifies the nature of the individual tasks which management may assign to individual workers. Work post rules, firstly, arise from the production approach to task organisation, and define a one-to-one relationship between the individual and the job. Its goal is to guarantee responsibility, meaning that individual workers are responsible for their own work post. In this system, a company is divided into work posts; when workers are hired, they do not know the specific tasks they will have to accomplish, but rather they expect a system of work-post rules that provide a specific job description and an inventory of tasks. Work post rules are common in US manufacturing and in the French manufacturing and service industries. Secondly, there are job territories rules, which stem from the training approach. They avoid listing tasks and are applicable to both blue and white-collar professional work.

The “tools of the trade” is a specific type of job territory rule applied to blue-collar work. It identifies tasks on the basis of either the kind of tools used or the materials handled by workers. Workers of a specific trade follow management directives to accomplish tasks within their given area. Management uses the tools of workers’ trade only for the required job. These tools are closely related to the kind of competence to be applied, such as the electrician’s screwdriver. In a different context, such as white-collar and professional work, the job territory rule takes a different form by focusing on particular types of administrative transactions or technical operations. “Tools of the trade” has been mainly applied to industrial and construction skills in craft labour markets in the UK.

Function/procedure-centred rules take a more indirect approach in their procedures, within which workers are organised in different categories. However, the problem of robustness limits the range of possible procedures that may work

effectively. Two main procedures can be identified in this case: the production approach and training approach. Under the former, competence rank rules assign members their work group position according to the range of tasks which they have the experience to undertake. The allocation of tasks is flexible and worker seniority plays an important role in a worker's rank. Seniority helps workers better manage several difficult tasks, and also promotes cooperation because it can reduce competition between members of the work group. However, worker seniority does not play an effective role when the group depends upon positive actions by its members. Such work assignments are based on seniority, which is related with average competence levels, and rank, which reflects the recognised competences of workers. These competence ranking rules are applied in large Japanese industrial firms.

Under the training approach, on the other hand, qualification procedural rules allocate tasks on the basis of recognised qualifications. These qualifications are conferred by formal agreement, convention or may rest on peer group custom. These rules define the work competencies and, only indirectly, the individual tasks. Under this approach a flexible process of skill recognition assures the link between workplace functions and the identification of appropriate work. Such a process involves some form of workplace traineeships which provide the procedures by which different kinds of workers can be identified and work distributed. Since both employees and managers have learned how workplace traineeships work in practice, competence rank rules are very robust, solve the problem of work experience and promote socialisation. Qualification rules are applied in German Industry for both skilled blue and intermediate white collar workers.

According to Marsden (1999), these four types of rules are sufficiently strong to offer the necessary guarantees to firms and workers and to manage the kinds of opportunism which commonly arise from the incompleteness of the employment contract. They are powerful institutions in the sense that they can affect the behaviour of individuals in the firm, absorb risk, and increase the chances of cooperation in the employment relationship.

According to evolutionary game theory, informal norms are not in themselves entirely exogenous, but rather emerge as part of a process of social interaction. They can emerge endogenously, even in the absence of state action, and develop

out of the free choices of companies and workers. They offer flexible limits to management authority and to the obligations which employees enter into with their employers. As a result, they restrain potential opportunism, raise the quality of performance and guarantee the stability of employment relationships. Without these protections, the employment relationship would not work, and firms would not exist as employing organisations (Marsden, 1999: 254).

The similarity between this and the appearance and prevalence of territorial rules among many species of animals was outlined by Maynard Smith (1982) in his “evolutionarily stable strategy”. Such models of behaviour are neither dictated by central authority nor enforced by collective institutions. Rather, they emerge out of repeated interactions between animals of the same species attempting to maximise their collective survival chances. It seems that human beings learn interaction rules more effectively than animals, regarding not only their own behaviour but how to interpret and respond to the behaviour of others. Thus, a crucial characteristic of any evolutionarily stable strategy in the field of employment is that once a particular rule has become prevalent, it becomes easier to predict how others will behave. A broadly diffused and well-tested rule is one that can be trusted, and as a result, whatever its intrinsic merits for a particular business, reactions to the rule will always be influenced by the decisions of others.

A similar process is at work with the decentralised diffusion of employment rules, in that they may be considered part of the relevant skills and a basis for other learned organisational routines. The firm progresses through its structured routines which rather than individual learning represent the key element of organisational learning, which is seen as a collective process involving individual elements that depend on the collective context into which knowledge is generated:

« learning to drive, for example, is an individual process, yet many of the key routines we are taught have a collective outcome. To enter a roundabout, we learn to give priority to vehicles coming from the right (that is, in Britain, where vehicles drive on the left). This is a simple routine, but it ensures a collective outcome that is also learned, namely a smooth flow of traffic through the road system. It only works if every driver respects it (Marsden, 1999:250) ».

Furthermore, organisational learning may be seen as a product of the resources flowing through a person's web of contracts. In personal trust relationships, enforcing informal employment rules involves mobilising members' connections both within and between its various units, and with external organisations so as to gain access to a variety of resources. The interaction between employer and employee, and between workers themselves, develops new cognitive skills and competences, and allows workers to better manage their actions. The agents of an organisational framework acquire routines or habits in the sense that they develop mechanisms for relegating particular ongoing actions from continuous rational assessment. Such habits may be regarded, as stated above, as the outcome of a process of "natural selection" (Hodgson, 1997, 2004a; 2004b). This ensures that the predominant informal rules tend to be efficient simply because they allow the survival of agents of the firm. Employment rules are strong because it is often too costly to change the rules of the game. The agents in this framework are portrayed as having plans or strategies, but when they enter a network, their preferences can change because institutions and relational mechanisms, such as reciprocity, influence them.

3. The Interplay between Employment Rules and Reciprocity: some Examples

In the attempt to produce conditions for the trust process to develop, detailed contracts can be destructive since the mistrust they demonstrate might engender further mistrust, risking it becoming a self-fulfilling prophecy (Macaulay, 1963; Zand, 1972). Managers' suspicion of workers' motivation leads them to set low-discretion work rules, which in turn provoke low-trust conduct by workers, thus confirming and indeed strengthening management's initial attitude. Fox (1974) defined this spiral of low-trust relations as a syndrome leading to low levels of workplace cooperation, where employees believe management they cannot be trusted, of their own volition, to deliver desired work performance. In this context the low-trust-low-discretion strategy is a common solution, the purpose of which is to limit opportunism in contractual relations. This strategy provides a safety net in that it not only protects employers from shirking by employees, but also protects workers from the power of their managers (Marsden, 1999: 255). In other words, this strategy consists of providing a specific definition

of job activities that constrain employee behaviour through standardised rules and routines, and in defining punishments and incentives in order to solve the frequent conflict between employer and employees (Fox, 1974).

The reason for such a downward spiral is not only the contrast between contract and trust but also the interpretation of contract with a detailed specification of duties. There are indeed different institutional arrangements that underpin employment relationships and which provide different levels of employee discretion. As described above, on the one hand, employment rules may be a source of high trust relationships in the workplace so long as they are flexible and allow a great deal of freedom, but on the other hand such rules require high-trust relationships because they lack the safety net provided by rigid rules. Thus, the managerial strategy arises from a virtuous circle rules-trust relationships-mechanism that offers an alternative framework for organisational action.

The gradual process of developing reciprocity between manager and employee based on this mechanism moves through several stages. The trust process may develop if the employer, within certain margins of risk, gives the employee the flexibility to act at his or her own discretion within the constraints of certain flexible rules. The process tends to start cautiously, where small successful steps generate increasing levels of trust. In other words, actions and relations based on trust are non-reflective in that they are non-calculative. Rather, trust depends on previous behaviour, and increased if one party's previous actions have been positive. In the workplace, this practice becomes an important element of tacit knowledge and tacit definition of work, and can quickly generate improved conduct and habits, thereby establishing an environment of trust.

Reciprocity and high-trust relationships compensate for flexible institutions' lack of robustness by facilitating effective sanctions and providing relational enforcement. Furthermore, they can affect access to information and improve a company's efficiency by facilitating coordinated actions. Thus, a high-trust/high discretion strategy may be optimal as it helps to reduce transaction cost (such as control costs) and has the advantage of flexibility because of the reduced need for detailed arrangements (Fox, 1974).

To summarise, there are two employment governance structures: the rigid governance structure and the flexible governance structure. The former is characterised by low reciprocity and low personal trust, as well as detailed employment rules and procedures. It relies on task-centred rules that identify job

tasks directly, simply and clearly. Employment parties trust each other because of the detailed institutional inventory of the organisation as well as the external environment in which it is embedded. The latter, on the other hand, is characterised by fewer detailed employment rules and reciprocity. It is based on function-centred rules that give only an indirect guide to work allocation. Discretion and reciprocity offer a stable framework for the actors' expectations and interaction, and they are sources of high interpersonal trust between employer and employees.

The aim of this chapter is to understand how relational mechanisms such as reciprocity may be efficiently combined with the transaction rules governing employment relationships in order to obtain stable co-operation between employer and employees. Usually, economic experiments put their subjects in an artificial situation, created according to a research structure involving either a specific variable or question. In other words, subjects are presented with an economic situation in which the behavioural response is predominantly numeric or nominal (e.g. price, costs, salary, categories of choices, yes/no answers). An economic experiment which aims to simulate a work situation should take into consideration the fact that the situation it attempts to replicate also involves choices which are not purely monetary. In fact, in a working relationship the employer must make an offer of a salary but the worker provides work which is not intrinsically a financial variable.

In experiments conducted by Falk and Gächter (2002), the offer of work and the effort level are reduced to choices with purely monetary consequences. The worker has to choose a level of effort, which has a cost dependent on different employment rules. This thesis will attempt to replicate the institutional details of employment relationships. The introduction of "actual tasks" permits a far more accurate simulation of work situations, since it facilitates the replication of the mechanisms which characterise the employment relationship and the working culture which otherwise cannot be simulated with economic experiments of the traditional kind.

The next chapter focuses on the "institutional gift-exchange game", a version of the "gift-exchange game" (Fehr *et al*, 1993). In this new institutional version of the experiment, the actual tasks consisted of research in fixed lists. Each worker had three lists made available to him or her: a telephone directory, in which they had to research the telephone number of a certain subscriber, an extract from an

Japanese-Italian dictionary, in which they had to research the Italian word that corresponded to a given word in Japanese, and a list of acronyms and abbreviations, where they had to search for the meaning of the acronym or abbreviation given.

The work contract involved carrying out ten tasks, although the worker could decide how many searches they wanted to carry out. Each search carried out successfully corresponded to an effort level of 10%. The increment in effort level was assigned when the worker correctly keyed the data into the computer. The software then checked the exactness of the research, to ensure that the research had been carried out correctly and thus the effort invested had been effective. The minimum level of effort required for the contract to be accepted, and therefore for the corresponding salary to be obtained, was 10% (one research task) in experiments with a flexible culture and 30% (three research tasks) in experiments with a fixed work culture.

Because of the importance of discretion to the evolutionary success of reciprocity it is useful to analyse the difference between rigid and flexible employment rules in the real world. Institutional gift exchange attempts to identify such differences by providing different methods of working. In such an experiment the function-centred rules of work in the flexible culture involved discretionary tasks, i.e. the option to choose which tasks to complete. The worker could choose whether to only search for telephone numbers, Italian words or acronyms and abbreviations, or indeed choose how many searches to carry out in the dictionary, how many words to look up or how the number of acronyms and abbreviations to find. Therefore, they could decide which combination of tasks suited them best.

On the other hand, task-centred work rules within a rigid work culture were more demanding in that the required research had to follow a specific sequence. The computer randomly presented a list of ten tasks, mixing together telephone lists, Japanese words and acronyms. Thus, from the outset, tasks had to be completed in the order given.

In the case of both function-centred rules and task-centred rules the worker had the right to choose the quantity of work they wished to undertake, a choice which was enacted on the basis of calculations allowed by the software. The factor which changed, in accordance with the rules of the game, was the quantity of work. The hypothesis of this research was that different institutional cultures

can influence working relations, even in psychological terms.

Overall, in institutional environments dominated by rigid employment rules, the relationship between employer and employee lies in respecting terms which have been specifically defined. By definition, no exercise of discretion is called for, since the specificity of the terms excludes choice. In terms of inspection, supervision and authority, these rules regulate the actions of employees in their task activities, in the rewards and punishments brought to bear upon them and in the relationship between employer and employees. In such a system obedience is the critical obligation for the employee's actions. No implicit obligations are required since the nature of these norms requires no favours or effort superior to the level specifically required. Anyone who is able to conform to the prescriptive rules must do as required.

Only flexible informal rules tend to engender feelings of personal obligation and reciprocity since they tend to generate a spiral of rising trust. Furthermore, trust between employer and employees may encourage them to go beyond formal contracts. In such an institutional context, individuals are not only motivated by the returns they are expected to achieve in the employment relationship. They do not always attempt to define the exact terms of interaction, but they also do favours, and while there is a general expectation of some future return, the exact nature of exchange is not definitively stipulated in advance. Favours create diffuse future and unspecified obligations. An institutional environment based on flexible employment rules can be analysed with the high-discretion, high-trust model.

4. Rigid Governance or Flexible Governance Structure?

The types of governance analysed in this thesis depend on the establishment of informal organisational norms, values, culture and relational mechanisms such as trust and reciprocity. The careful selection of members and socialisation help promote these common values and beliefs. Rituals and ceremonies serve to identify and reinforce acceptable behaviour among members of the clan, and individuals are rewarded for acting in accordance with the group's values (see Ouchi, 1980). Such types of governance may also be based on factors such as friendship and relationships as well as the reciprocity which arises from relational investments (Wittex, 1999). More precisely, based on the different combinations between distinguishing kinds of employment rules and reciprocity mechanism we

can identify two several distinct alternative patterns of co-ordinating employment interaction between manager and workers: the rigid governance structure and the flexible governance structure.

The rigid governance structure is characterised by low reciprocity and personal trust, and detailed employment rules and procedures. This structure is conducive to the production of trust arising from institutions within the organisation. It relies on task-centred rules which identify job tasks directly, simply and clearly. Employment parties trust each other because both the detailed institutional inventory of the organisation and the external environment in which it is embedded offers a stable framework for actors' expectations and interactions. As such, the rigid governance structure is strong and, in an environment of low interpersonal trust, may limit the four areas of opportunism identified in the previous chapter. Specifically, when it relies on the "work post" rule, tasks are assigned to workers via an abstract inventory.

In fact, the essence of the work post rule is the identification of a set of complementary tasks which are assigned to an individual job holder responsible for their execution. This kind of explicit relationship identifies a set of discrete areas of work for which employees are individually responsible, and provides a clear and unmistakable job definition. In addition, it reduces the scope for opportunism in the sense that the work post rule sets clear individual responsibilities for the execution of certain tasks, thereby limiting the potential for employees to either cut tasks from their own jobs or impact on the tasks of other workers. This rule defines the limits within which management may exercise its authority over the assignment of work. Thus, the clarity of task assignments in work posts enables both management and workers to identify those who are and those who are not responsible for particular tasks. The other purpose of work post is to define responsibility so that employees' tasks obligations can be better enforced:

« It is notable that under many work post systems management have opposed workers assisting each other in the fulfilment of their tasks because this blurs the lines of accountability. The clarity of work assignments protects both parties from unilateral job enlargement and reduction because the demarcation lines have been clearly set out. In practice, the job descriptions associated with

work post often diverge considerably from the work actually undertaken » (Marsden, 1999: 48).

The rigid governance structure may also be based on a second type of task-centred rule, namely the job territory rule. Through this rule, management limits an employee's authority by establishing a criterion for identifying the tasks associated with a particular job territory or tools of the trade. The main difference between the work post and job territory rules is that under the training approach, a job territory's key operations are determined in relation to training and skills needs rather than complementarities in production. Under job territory rules, institutional governance may be a partial solution to the opportunism in the area of job boundaries and work allocation. Management knows that if a particular task requires the use of certain tools, then it can be assigned without further negotiation to a specific class of workers. Moreover, it knows who is in charge if certain tasks are not performed. As with the 'work post' rule, independent reassignment of tasks by either party would upset the equilibrium with other groups. For the worker, this transparency makes it difficult for management to reassign and add tasks unilaterally, meaning that both parties are protected from opportunism.

The flexible governance structure, on the other hand, is characterised by function-centred rules which provide only an indirect guide to work distribution. The structure allows workers and management discretion in identifying tasks, and at the same time, provides a high level of flexibility in task assignments. This structure additionally benefits the employer in that they have a tool to maintain a cooperative relationship. However, there is also risk associated with these rules. If cooperation were to stop, management would find it difficult to identify which individual was responsible, and there is no clear definition of duties that can be used to draw the line collectively. Thus the consequence of failed cooperation in these kinds of rules is more serious than when it has easily enforceable job descriptions.

Such a system provides, in addition to formal knowledge, a significant amount of implicit knowledge regarding work tasks and the practical function of work groups. Through apprenticeships or professional training, workers learn how to apply the rule in practice, when faced with a variety of workplaces. It provides benefit to both management, who can assign tasks to employees with greater

flexibility (especially for incidental tasks that do not belong to a skill's core competence, but which cannot easily be assigned to other workers without loss of efficiency) as well as workers (former trainees) who gain greater familiarity with task allocation norms, resulting in them being better able to identify and enforce limits to managerial authority. Thus, in the flexible system there is no one-to-one linking of workers to jobs, and jobs to tasks, but a more flexible institutional structure that relies on procedures that regulate the distribution of work within groups. Such an indirect link with work task makes monitoring more difficult, creates capacity for jobs with diffused and overlapping boundaries, deprives workers of any clear reference point limiting their contractual obligations to their employer and, therefore, increases the possibility of opportunism. Nevertheless, in a flexible system and under given requirements, work group organisation and the status system characterised by the progression between ranks over time and depending on long-term employment, may restrain the opportunistic behaviour of both parties.

In the production approach, there are compensating mechanisms that rely on a kind of reciprocity in that the worker benefits from more flexible working practices and a greater quality of skills so long as he or she respects the internal norms of the work group over task allocation (positive reciprocity). Otherwise, if the employer does not respect the pay and other norms that sustain the competence rank model, then the work group can react by diminishing cooperation (negative reciprocity). Given the presence of abuse of authority and absence of a safety net provided by specific job descriptions, workers may feel the stakes are too high, which may damage the flexible working environment. Furthermore, management can gain a measure of control through staff appraisals conducted by line managers, and can use this to manage the rate of progression between ranks. However, if the progression were too slow its incentive effect would be lost. This would be especially dangerous because this rule lacks the safety net provided by the explicit job descriptions of the work post system. In addition, a degree of reciprocity is possible with the "qualification rule". The possession of occupational skills means workers can quit if the managers' offer looks less stable than elsewhere. The clear classification of skills by qualifications and their associated training procedures, something which is absent under the production approaches, enables skilled workers to easily identify who should receive skilled rates of pay, whatever the tasks on which they are currently

engaged. Thus, task assignments can be controlled effectively by making it more expensive for the employer to allocate them a range of lower-valued tasks.

Competence rank rules avoid the detailed identification of individual workers and offer the possibility for worker improvement and new learning opportunities (Koike and Inoki, 1990) Ranking procedure systems give workers a greater degree of autonomy than the work post rule since they are able to both conduct tasks and work-related problem-solving activities and increase their skills through job-training. Rank determines the conduct of training in the sense that higher-ranking workers help train more junior ones, and the latter accept their position in the expectation that they will someday rise to a higher rank. Management respects these norms because were it to abuse its authority, the knowledge that resides in the work group might be used against it.

Qualification rules offer more variety in problem solving and pose a less significant threat to the integrity of the allocation rule because workers behave flexibly. Qualification rules provide an incentive to develop skills and new competencies, and provide a more efficacious way of dealing with unusual tasks than under task-centred rules, because the desire of the worker to maintain the benefits arising from controlled flexibility is greater than the defensive protection offered by task-centred rules.

Furthermore, under competence rank rules, jobs lack the distinctive identity provided by the detailed job descriptions of the 'work post' rule. In addition, experienced workers lack the safety of clearly defined posts, and junior workers lack signs of progression between tasks that might motivate them to learn. Without a clear job structure, senior workers cannot work appropriately. One of the most important protections offered by the competence rank model is the ranking process itself, since this is an outward, evident sign of management's recognition of worker competencies.

According to the theoretical background of this thesis, the following represents the first hypothesis:

- Hypothesis 1: The positive impact of reciprocity is stronger in flexible transactions than in rigid transactions.

In other words, reciprocity is more important in the flexible governance structure than in the rigid one. In the flexible framework, individuals develop trust

in their relationships primarily on the basis of inter-personal contacts. Interpersonal trust requires considerable effort on the part of individual actors. It depends on their idiosyncratic interests and the situation within which they make their decisions. Consequently, the flexible system must rely on relational mechanisms such as reciprocity in order to maintain the power of authority and protect against opportunistic behaviour by either party. Positive reciprocity enforces the work of less specific rules by providing socially-effective sanctions, and represents a complementary means of developing cooperation within the firm.

The second hypothesis is as follows:

- Hypothesis 2: The positive impact of reciprocity is stronger in repeated transactions than in one-shot transactions.

In one-shot iterations, reciprocity may be riskier than in the rigid approach. In other words, reciprocity takes time to develop because individuals develop trust in relationships primarily on the basis of personal contact. Interpersonal trust requires considerable effort on the part of individual actors. It depends on their idiosyncratic interests and the circumstances in which they make their decisions. It may be riskier than power mechanisms in that when trust breaks down, devastating effects on interpersonal relationships may result, which quickly erode the organisational climate.

On the basis of these two hypotheses we may assert the following main proposition: while rigid governance characterised by task-centred rules and low reciprocity is better suited in one-shot transactions, flexible governance characterised by function-centred rules and a high level of reciprocity is better suited to a repeated game.

Strongly institutional governance (based on the application of the two different task-centred rules) deals with the different areas of opportunism by clearly establishing and directly limiting employees' obligations. It is forceful and makes the open-ended employment relationship a viable and attractive form of contract. It restrains exploitation by either workers or employers, provides impersonal forms of trust and offers stable co-operation in the employment relationship. Nevertheless, this kind of governance has the disadvantage of being rigid, struggles to adapt its rules to more variable work demands connected to new technology and team-work. Rigid transactions may sacrifice high efficiency in

order to provide stability, but in a one-shot scenario it may be better than the flexible approach since reciprocity takes time to develop.

With a flexible governance structure, employer gives employees a greater degree of discretion. The rules of this structure are more flexible but less robust than task-centred rules, and rely heavily on high-trust relationships based on reciprocity. With long-term transactions, reciprocity between employer and employees affects the behaviour and attitudes of the parties, and represents a key element underlining flexible governance. Such mechanisms may lead to mutual dependence between the parties and enforce mutual trust. Trust, in this case, resides in implicit relational dependence between individual actions. As stated above, the pro-social action of one party generates friendly behaviour on the part of the other party and vice versa. In this way employer and employee may perform better.

5. Conclusions

Two main traditional governance devices that can enforce employees' behaviour and promote co-operation between employers and workers can be identified. In rigid environments characterised by task-centred rules, job tasks are assigned in a clear way, and sub-standard performance may be easily attributable and sanctioned. Task-centred rules are robust and can function well where there are low levels of personal trust. The detailed institutional inventory of the organisation, as well as the external environment where it is located, offer a stable framework for an actor's expectations and interactions. Rigid employment rules are supported by monitoring, detection mechanisms and punitive sanctions. They are low-discretion rules which alienate employers from the moral nature of work. In this sense, the rigid governance structure is strong and, where there is low interpersonal trust, may restrain opportunism and deal with problems of uncertainty. Hence, a governance structure that relies on such rules does not require significant investment in employer relations and may therefore be defined as the rigid governance structure.

Thus, rigid employment rules tend to promote a spiral of failing personal trust, defining an employment relationship in terms of specific terms of exchange. In other terms, the detailed employment rules applied in this governance structure are sufficiently stable to build a secure agreement for cooperation between firms

and workers. Institutional governance is not very flexible in that the parties do not have a high level of discretion to react swiftly to changes in an uncertain environment. Furthermore, institutional governance reduces the positive impact of reciprocity.

In contrast, through function-centred rules, the employer gives a greater degree of discretion to employees. Personal trust and reciprocity are a critical element of a management strategy that provides informal employment commitments and may be defined as flexible governance structure. Reciprocity represents a complementary means of maintaining power of authority, compensates the loss of strength of function-centred rules and underpins cooperation in the firm (Powell, 1996). This kind of governance is less robust than institutional governance because the function-centred rules on which they rely are partially unstable. They need to be enforced by interpersonal trust and reciprocity, but this mechanism takes time to build and solidify. When understanding and expectations are violated through opportunistic behaviour, reciprocity is weakened and it can be very difficult to re-build.

Chapter 4

The Rigid Governance Structure versus the Flexible Governance Structure in the Institutional Gift-Exchange Game

1. Introduction

The analysis undertaken here has produced several insights, which are outlined below. Firstly, the traditional opportunistic model of economic behaviour proposed by Williamson could be replaced by an alternative, more comprehensive micro-foundation of action where different social norms are also decisive elements. Secondly, if this is true, then it becomes important to have a model of an economic agent that focuses on the importance of social preferences such as reciprocity. Williamson's bounded rationality model defines economic agents as being selfish, and only takes into account traditional economic incentives. The employment rules and reciprocity analysed in this thesis are new, creative, relational and institutional governance devices.

Fehr *et al.*(1993), in particular, created a version of the gift exchange game, the purpose of which is to test the potential role of reciprocity in a multiple one-shot gift exchange game. In many cases reciprocity may be more appropriate than an economic incentive contract, for example in uncertain situations where there is low measurability of performance. This is because it aims to reduce the discrepancies between organisational goals and employer's interests through the establishment of common values and interests. Reciprocity may maintain mutual cooperation by ensuring mutual benefits and can deter employees from acting opportunistically.

Even so, when the opportunities to defect are high, reciprocity may not be sufficient to constrain strategic opportunism and must be completed by certain institutional arrangements. An analysis of this would suggest the need to develop an alternative micro-foundation of organisational behaviour, and to study the institutional and relational structure within which the actions take place. This chapter goes beyond the gift-exchange game provided by Fehr and others (1993)

and shows that the power of reciprocity depends on the details of the institutional structure of employment relationships.

Depending on the institutional situation, there are two distinct governance patterns of controlling relationships: the institutional rigid governance and the relational flexible governance. The former is characterised by task-centred rules and defines the boundaries of jobs in a much more specific way than the latter. The relational flexible governance characterised by function-centred rules provides a more flexible and discretionary model of employment relationship.

This chapter elaborates the “institutional gift-exchange game”, a version of the “gift-exchange game” (Fehr *et al*, 1993). Its principal innovations are as follows: an analysis of new kinds of transaction not hitherto studied by means of experiments, and which have given rise to new theoretical insights; the completion of real tasks which better simulate the work situation in which the transaction rules would apply; and the use of computers, which has enabled the experiment to be set up more efficiently.

The second section analyses the potential of experiments in labour market phenomena. To understand how experiments can work in the labour market as well as in personal economics, two crucial points need to be made: firstly, that the norm of reciprocity that leads to gift exchange is an effective contract enforcement device where uncertain conditions exist and, secondly, that institutions and the rules of the game shape the effects of reciprocity. One of the main advantages of experiments is that they can establish institutions of the game in order to examine the power of reciprocity in different normative environments, thus enabling ideal conditions for the proper analysis of employment theory predictions.

The third section explores the institutional details of reciprocity and its interplay with transaction rules in the institutional gift-exchange game. In doing so it also provides research implications. The proper analysis of the efficiency of this governance device requires an understanding of how it is combined with different informal employment rules. As such this thesis studies the four treatments of the “institutional gift-exchange game”: the one-shot flexible treatment (with non-repeated interactions and flexible rules) the repeated flexible treatment (with repeated interactions and flexible rules); the one-shot rigid treatment (with non-repeated interactions and rigid rules) and the repeated rigid treatment (with repeated interactions and rigid rules). Generally speaking, the

mixture of employment rules and trust mechanisms offers a foundation on which employment relationships may be built, and thus ensures that both parties obtain some of the key benefits they seek.

The fourth and the fifth sections show the experimental results of the institutional gift-exchange game. To better understand this game and its experimental results, the sixth section creates a payoff map. This map is a set of possible combinations of the employers' profits (π) and the workers' gains (u) that are achieved in each period. It directly provides complete information about workplace welfare (the total amount of players' gains). By tracing the points on the map which correspond to the average levels of payoff obtained during the course of the iterations, a comparison between the average levels of workplace welfare obtained in the different treatments and the levels predicted by game theory can be obtained. In addition, by tracing the payoff frontier (i.e. the geometric location of the points corresponding to optimal payoffs) the performances of the different treatments can be examined. Conclusions will also be provided in this final section.

2. Some General Considerations about Experiments in Economics

Before testing the research hypotheses and analysing the experimental results of the institutional gift-exchange game, it is necessary to make some general observations about the importance and relevance of experiments.

Experimentation is very common in those branches of science where it is necessary to analyse causal affirmations. The need to investigate the relationship between cause and effect in the behavioural sciences has brought about the application of scientific method. Experiments also play an essential role in advancing economic models, and will become more important as scholars develop increasingly sophisticated research programmes. Economic experiments consist of reconstructing artificial situations which simulate real ones, wherein the subjects have to make economic decisions. Such situations are under the control of the experimenter in the sense that he or she can control the external variables and measure the independent and dependent variables.

In other words, the experimenter can perfectly observe and certify the choices made by subjects, and evaluate the consequences of these decisions. Moreover,

the situation in which subjects make their decisions can be carefully controlled and mixed by the experimenter. As in experimental physics, it is not necessary wait for something to happen by chance, rather an experimental situation can be established according and the effects observed. Thus different research designs should be used, with different treatments being applied to different groups, each of which is randomly assigned.

If groups are assigned randomly, the possibility of systematic error can be reduced, thereby allowing inferences regarding their casual relationship to be made. In the experiments, the deliberate assignation of selfish players exclusively to a treatment causes a systematic error and invalidates the results. Randomisation also helps to guarantee independence both within and between treatments' observations. Independence is essential for many experimental analyses, and its failure can lead to misleading conclusions. An objective randomisation procedure reduces the risk that participants in one treatment might systematically vary from participants in other treatments.

Economic experiments can be analysed using game theory methodology, in both descriptive and in predictive terms. When game theory predictions are not verified by empirical results, one must review the theory and hypotheses of the research, and propose a new behavioural model. Experiments, however, may bring with them particular problems. One such problem is whether experimental results can be generalised. Herein there are two questions to consider: that the selected subjects are representative (population validity) and that laboratory experiments are too simple relative to the problems of the outside world (environment validity). These problems have been present in the methodological debate ever since the first publications on the scope and method of economics, remaining unchallenged until the mid 20th century when the first experiments were conducted. In the Southern Economic Association of 1991, Charles R. Plott argued that « economics is one of the few fortunate sciences to have both the field and the laboratory with which to work » (Plott, 1991: 918).

The first concern of external validity is population validity, that is, the choice of experimental subjects. University students are frequently employed as subjects since they are available and have relatively low opportunity costs. The problem, however, is whether their behaviour is indicative of the behaviour of “real” market participants such as employers or employees. To investigate this problem, there are many experiments which use the relevant subjects as participants

(traders, managers, professional auction bidders, lobbyists). Even though some dissimilarities are found, these studies find that the general patterns of behaviour frequently correspond remarkably well to the students'. As demonstrated by Friedman and Sunder (1994:5), the results of an experiment are externally valid if they may be generalised in another field. Experimental results are valid if the causal affirmations of experiments are applicable to other circumstances.

To guarantee the involvement of participants in the experiment (i.e. to ensure that they act, as far as possible, in the same way as they would in real life), it is important that they have a genuine interest. As such, monetary gifts are generally offered, so that by participating in the experiment they can earn as in real life. Obviously, this money is earned as a result of the choices they make during the experiment and are not normally of a high value (see appendix II). Moreover, economic experiments are usually designed to minimise the convenience of lying. In economic experiments, the participants have incentives to make an effort to tell the truth because they are paid on the basis of the decisions they make.

With regards to the second issue of oversimplification, it is important to note that all economic models are abstract. Thus if one wishes to challenge experimental economics, one must also criticise economic modelling. Like economic modelling, experiments identify the basics of different environments where economic activities take place. In other words, experiments take into account the main variables of the problem under examination. In traditional economic observations, the observer cannot control all the variables which might influence the outcomes of the objects of study. In defence of this, this would not be possible, or at least it would be improbable, when the subject of study is something like the world economic system, a national or regional economy, or the practices of a company. Microeconomic investigations conducted by means of experiments are more easily achieved, especially when the subject is human behaviour. Experimental economics are sufficient to create a real microeconomic system, as defined by Smith in his seminal 1982 paper *Microeconomic systems as an experimental science*, where he defines the microeconomic system through two basic concepts: the microeconomic environment and microeconomic institutions. The former is defined as "the initial endowments, preferences and costs that motivate the exchange." (Smith, 1994: 113) while the latter is described as:

« the language (messages) of market communication (bids, offers and

acceptances), the rules that govern the exchange of information, and the rules under which messages become binding contracts. This institution is defined by the experimental instructions which describe the messages and procedures of the market » (Smith, 1994: 113).

The experimental performance is thus a function of both the environment and institutions that represent the controlled variables of the experiment.

Experiments allow researchers to verify theories and to test the role of the environment and of institutions. Thus it is becoming more common, normal, since one of the main results of experimental inquiry is that institutions matter (Smith, 1991; 1994; 2002; Plott, 1991). More precisely, experiments allow the comparison of different normative environments and define empirical regularities as a basis for new theories.

To appreciate the role of the experiments in this thesis it is useful to point out the following two main advantages. Williamson's theory makes assumptions about the agents and the institutions as well as the behaviour of the agents to derive predictions about the outcome of the system. One of the main assumptions is that trust is very low in economic transactions. It is usually assumed that agents are rationally bounded and self-interested, that is, they are only interested in their own material well-being. In other words, they do not deal with information optimally, and have opportunistic expectations about the behaviour of other agents. Thus the question as to whether this theory describes and predicts economic decisions and behaviour accurately must be asked.

To decide whether a theory is right or wrong using field data faces a number of problems. The predictive power of the theory can be evaluated only if the assumptions about the environment and institutions in the model are consistent with those of the field settings to which the theory is applied. Data about institutions, relationships and all relevant features of the agents are not always available. If the predictions of the model seem to fail, we can never be sure whether the behavioural assumptions of the theory are flawed, or else whether the assumptions about the economic agents and the institutions are not in line with those of the field setting.

One main advantage of experiments is that they may be designed in such a way that the experimenters are able to control the relevant variables. They can set up the characteristics of the agents and the rules of the interaction in the

experiments. This enables experimenters to evaluate the predictions of the theory under ideal conditions, a process sometimes known as testing a theory in its own domain. Another important advantage is that experiments can provide information about the performance of institutions even where theory gives little guidance, since some institutional settings are too complex to be solved theoretically. Instead, experiments can examine the performance of different institutions because the *ceteris paribus* clause can be honoured. This is extremely helpful in order to draw valid conclusions about comparisons and to examine comparative predictions. The experimenter can design the normative environments and obtain important information about the impact of each single institution.

We can therefore conclude by proposing that economic experiments are an important alternative instrument in the field. They improve the depth of the research and make a contribution that could not be obtained from other sources. At the same time it must be acknowledged that experiments, like any method, have their limits. Whilst experiments are no panacea, they are a valuable additional source of information.

3. The Institutional Gift-Exchange Game

In the one-shot gift-exchange game, the standard prediction of the minimum effort level and of the lowest wage offer is not empirically confirmed. The results of one-shot experiments show that, contrary to the selfishness prediction, workers choose effort levels that increase the offered wage payment (Fehr *et al.* 1993; 1997). Players seem to understand that standard equilibrium payoffs may be dominated by more cooperative play. Furthermore, the effects of repeated games may contribute to increasing effort levels relative to the inefficient reference outcome. Experiments by Falk and Gächter (2002) show that average effort levels are significantly higher in the RG treatment than in the OS treatment. Reputation and reciprocity are complementary enforcement devices. Given the empirical importance of reciprocity in these baseline treatments, this thesis investigates the occurrence of reciprocity in different institutional environments, and asks two specific questions: can the findings about reciprocity in the baseline treatment be replicated in flexible or rigid transactions, and does reciprocity in the repeated game depend on flexible or rigid transactions?

The “institutional gift-exchange game” goes beyond the previous version of

the so-called “gift-exchange game” introduced by Fehr *et al*, offering the following innovations: the introduction of new transactions which take into account the various norms regulating labour relations; the completion of real tasks; the use of the computer by players during the course of the experiment (see appendix II). The software used to carry out the experiment allows players to rapidly perform the calculations necessary to make decisions, whereas in the experiments of Fehr and Gächter these were carried out on paper (so-called paper-based economic experiments). Workers do not limit themselves merely to choosing a level of responsibility: they must also carry out actual personal tasks. The contract proposed to the employees requires the researching of vocabulary from three lists made available to them (a list of telephone numbers, a glossary of Japanese vocabulary and a list of jargon and acronyms). The software monitors the execution of the tasks, with every word searched for needing to be keyed into the computer. The number of iterations of each section of the experimental “institutional gift-exchange game” is six, fewer than that in the experiments of Falk and Gächter (2002). The reason for this is that subjects require more time to accomplish actual tasks.

In the “institutional gift-exchange game” various institutional working environments are simulated, characterised by either rigid or flexible rules, which are applied both to the one-shot and the repeated elements (where interactions are always repeated with the same person). Flexible rules (function-centred rules) permit a certain level of discretion in carrying out the real tasks and fix the minimum effort required to accept the contract at a low level. Rigid rules (task-centred rules), on the other hand, set up more demanding real tasks and fix the minimum effort required to accept the contract at a high level.

To be more specific, the combination of the one-shot game / repeated game and the flexible norms / rigid norms permits the following treatments:

- The one-shot flexible transaction (OSF), characterised by non-repeated iterations and a flexible institutional culture.
- The repeated flexible transaction (RF), characterised by repeated iterations and a flexible institutional culture.
- The one-shot rigid transaction (OSR), characterised by non-repeated iterations and a rigid institutional culture.
- The repeated rigid transaction (RR), characterised by repeated iterations and a rigid institutional culture.

The structure of the game played in the experiments is a version of the “gift-exchange game” (Fehr *et al.*, 1993). This is also a two-player, sequential move game. In the first stage, the employer offers its employee a salary w . In the second stage, the employee can either accept or reject the offer. In case of rejection both parties gain nothing. If the employee accepts the offer, he or she must decide on an “effort level” e related to a “effort cost” $c(e)$. The second stage is completed after the employer has been informed about the employee’s effort choice. At the beginning of the experiment, subjects were randomly assigned to their roles as “employers” and “workers”, keeping their role throughout the experiment. There were an identical number of workers and firms. After the subjects’ roles were determined, workers and firms were randomly assigned to the four different transactions (the One-shot flexible transaction, the Repeated flexible transaction, the One-shot rigid transaction and the Repeated rigid transaction). The experiments were not performed using hard copy, rather each player had a computer containing the institutional gift-exchange game software. Procedure and payoff functions were explained in the instructions provided by the software. Employers made their wage offers by inserting them *privately* into their computer (see software instructions). The software then recorded and transmitted this information to the workers. Only the worker matched with a particular employer was informed about his/her employer’s wage offer. Following this, the workers made their effort level choices. In these experiments, participants not only chose the level of effort, they also actually carried out the tasks assigned by the employers. These are experiments with real effort (or tasks). The software checked the executions of tasks assigned. For each right number, word or key meaning completed by the workers, the software attributed a level of effort of 10%. Specifically, the feasible effort levels and costs of effort in the experiment were as depicted in table 4.1:

Table 4.1 Levels of effort and costs

Phone Numbers	1	2	3	4	5	6	7	8	9	10
Words Meanings										
Effort Level	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Cost	0	1	2	4	6	8	10	12	15	18

The software subsequently transmitted information about the employee’s

performance to the employer. In total there were six sections, with each one-shot negotiation involving a sequence of six one-shot games and ensuring that a particular pair of subjects interacts only once. Conversely, in the repeated transactions, each pair was informed that they would play six repeated versions of the same game. The players were informed that their identity would not be revealed.

In the one-shot game employers and workers were matched with a different partner for each iteration. It is necessary to have a number of pairs equal to or greater than the number of iterations. Since six iterations are carried out, at least six pairs are required; in other words twelve people are needed to complete a single one-shot experimental session. The workers used the same seat, and thus the same computer for each iteration, whilst the employers rotated for each turn. Nobody was informed of the method of rotation but obviously they did know that they were meeting a different employer (if a worker) or a different worker (in the case of employers) each time. At the start of each turn the workers sat in the position indicated by the position cards they were given. As a result of the rotation indicated the employers found themselves in a different position for each turn. Since the computers used in the experiment were not connected to a network, the choices of effort-level made by the workers, sitting in the same seat for the entire simulation, were not communicated across the board to all the employers, but to the same experimenters. The employers used the programme interface to calculate the profits of the previous iteration and formulate their offer for the next one.

In flexible transactions, an employer's payoff function in terms of experimental money π , is given by

$$\pi = (v - w) e$$

where v represents an exogenously given redemption value, that is the maximum amount of money an employer may offer to employee. An employer's redemption value was $v = 120$. However, the minimum wage offer, $w = 20$, is equal to the worker's opportunity cost for being in the job. As such, the wage offer had to be between 20 and 120 ($20 \leq w \leq 120$). A worker payoff function is simply the difference between the accepted wage, w , and the effort cost $c(e)$ minus some fixed cost of 20:

$$U = w - c(e) - 20.$$

The minimum enforceable level of effort is 0.1.

In flexible transactions, the employee has a considerable degree of discretion over tasks assigned, being able to freely choose the kind of tasks to perform. What mattered was the number of words, numbers or meanings entered.

In rigid transactions, the employer's payoff function is the same as in flexible transactions, namely

$$\pi = (v - w) e$$

However, the wage offer had to be between 22 and 120 ($22 \leq w \leq 120$). In rigid transactions, the minimum wage offer is 22 because of the minimum enforceable level of effort is 0.3. Furthermore, the fixed cost is 22. In this way, the rules of game of rigid transactions are perceived by employees as being more severe than those of flexible transactions. A worker's utility function is

$$U = w - c(e) - 22.$$

In the transactions characterised by task-centred rules, employees must accomplish the task assigned in accordance with the detailed list provided by the software. What mattered was not only the amount of tasks accomplished but also the order and the types of tasks specified by the software.

The main differences between the different transactions are illustrated in table 4.2:

Table 4.2 Different transactions

<i>Transaction</i>	<i>Interactions between parties</i>	<i>Rules of the game</i>	<i>Minimum/Maximum effort</i>		<i>Minimum/Maximum wage</i>	
OSF	Non-repeated	Function-centred	10%	100%	20	120
OSR	Non-repeated	Task-centred	30%	100%	22	120
RF	Repeated	Function-centred	10%	100%	20	120
RR	Repeated	Task-centred	30%	100%	22	120

The players were given printed cards with their reference code and the place they were required to sit for each turn. Each place, equipped with a computer, was labelled with a unique identifying number. On their cards the players noted their choices of salary and effort level, as well as their own earnings and those of their partner for each turn. This allowed them to retain information from previous interactions and thus make their decisions with the benefit of the information accumulated. The impact of mistaken recollection was therefore eliminated, meaning that the players could act in a more realistic way, referring back to the outcomes of previous interactions.

4. Experimental Results

Ninety-six subjects participated in the experiments, twenty-four for each of the four treatments. The subjects were students (not in economics) recruited from public lectures at various education institutions in Sicily, Italy. None of them had ever participated in an experiment. The experiments lasted between four and six hours. The general experimental results of the four treatments are shown in the table of appendix I, while table 4.3 below shows the summary of average value during the four treatments:

Table 4.3 Summary of average values during the treatments

	w	e	π	$\sigma(\pi)$	u	$\pi + u$
<i>One-shot flexible</i>	35,95	0,18	14,40	11.32	14,60	29,00
<i>One-shot rigid</i>	46,18	0,26	18,52	9.14	20,85	39,37
<i>Repeated flexible</i>	46,21	0,35	23,42	14.42	21,33	44,75
<i>Repeated rigid</i>	38,80	0,25	20,14	11.15	14,31	34,45

The average salaries, effort levels and profits are shown, as well as workplace welfare ($\pi + u$), namely the average sum of the employer's profit and worker's utility which can be used as a simple index of the performance of the employment relationship. Furthermore, the tobit regression results and the general

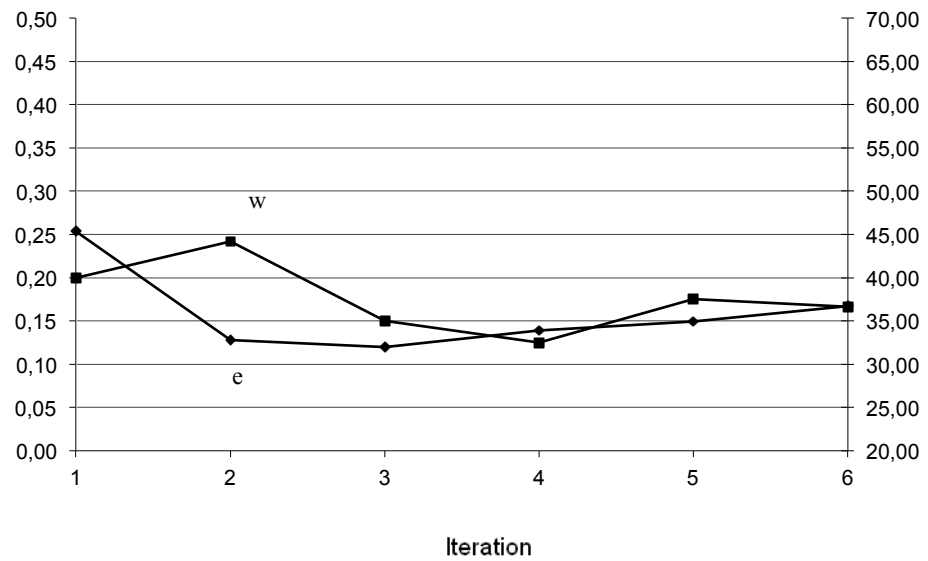
experimental results of the four treatments are shown in the tables 4.4:

Table 4.4 Tobit

Variable	osf	Osr	Rf	rr
Model				
W	0.00399014**	0.00445954	0.01053265***	0.0096865
Constant	0.3335401	0.09786463	-0.14310535	0.26943146***
Sigma				
Constant	0.13105137	0.05414654***	0.18623569	0.05005373**

Similar to Falk and Gächter (2002), this thesis uses the *tobit* model because it estimates a linear regression model for a left-censored dependent variable (effort) where dependent variable is censored from below (the minimum enforceable levels of effort is 0.1 in the flexible treatments and 0.3 in rigid treatments). The wage effect on effort level is not statistically significant in both the OSR and the RR treatments. Reciprocity is not relevant in rigid environments. Instead, wages positively affect the effort levels in the OSF and the RF treatments. Wage coefficients in both the OSF and RF treatments are positive and highly statistically significant ($p < .001$). The positive impact of reciprocity is stronger in flexible transactions than in rigid transactions. Furthermore, the tobit regression results reported in table 3.2 suggest that repeated flexible interaction strengthens reciprocity. More precisely, the impact of wage on effort (the regression coefficient is 0.0105) is stronger in the RF treatment than in the OSF-treatment (the regression coefficient is 0.0040). In addition, workers' behaviour is more cooperative in the RF treatment. In short, the positive impact of reciprocity is stronger in repeated transactions than in one-shot transactions. Indeed, figure 4.1 shows the evolution of average wages and effort levels in the OSF treatment.

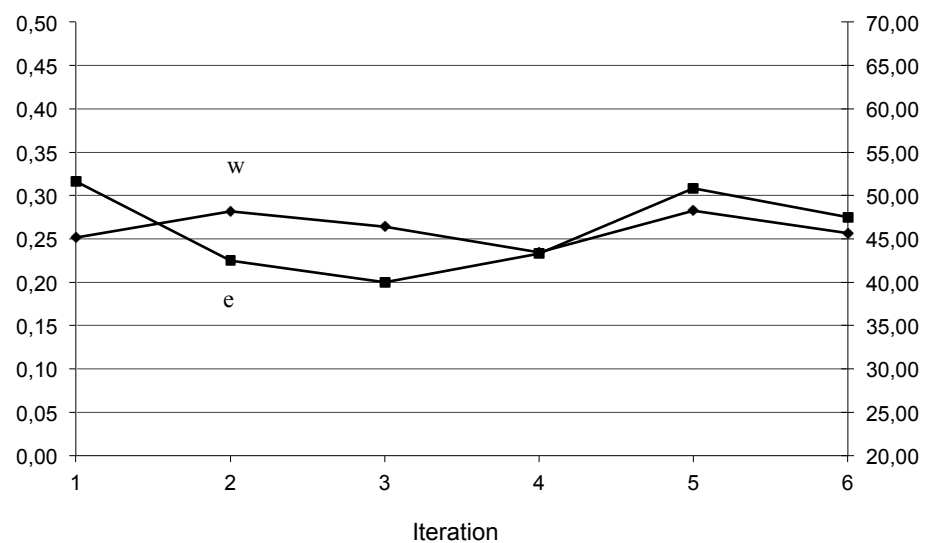
Fig. 4.1 Average wage (w ♦) and effort levels (e ■) in the OSF treatment



The immediate conclusion here is that both average wages and effort levels clearly exceed the levels predicted under opportunistic behaviour, i.e., compared to the reference outcome ($w^* = 21$ and $e^* = 0.1$) there is a strong and systematic deviation. Firms pay $w > w^*$ and workers reciprocate by providing $e > e^*$. Behaviour based on reciprocity significantly improves their payoffs compared to the levels predicted under opportunistic behaviour.

Figure 4.2 shows the evolution of average wages and effort levels in the one-shot rigid (OSR) treatment.

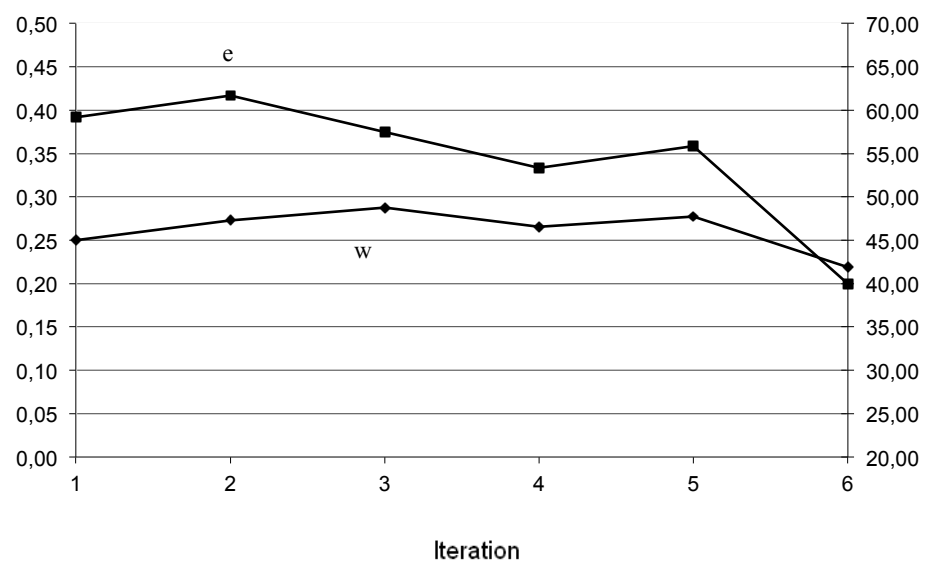
Fig. 4.2 Average wage (w ♦) and effort levels (e ■) in the OSR treatment



In the OSR treatment, average wages exceed the levels predicted under opportunistic behaviour; i.e., compared to the reference outcome ($w^* = 23$) there is a strong and systematic deviation. Rather, effort levels are below the predicted level ($e^* = 0.3$). In the OSR game reciprocity is incapable of raising effort levels above the minimum enforceable levels. However the power of the rigid system may enforce labour contracts and sustain an average effort level (0.26) higher than the OSF average effort level (0.18). Although the average effort level is below the predicted level in the OSR treatment, the robustness of task-centred rules increases their efficiency relative to the OSF treatment. In one-shot transactions, workplace welfare is higher in the rigid system than in the flexible system (39,37 OSR > 29 OSF). More precisely, the employer's average utility in the OSR treatment (20.85) is higher than the average utility in the OSF treatment (14.60); and the actual average period profits in the OSR treatment (18.52) is higher than the average profit in the OSF treatment (14,40). Furthermore, task-centred rules reduce risk: the lowest standard deviation is in the OSR treatment [$\sigma(\pi) = 9.14$]. In summary, rigid governance characterised by task-centred rules and low reciprocity is more suited to one-shot transactions.

Figure 4.3 shows the evolution of average wages and effort levels in the repeated flexible (RF) treatment.

Fig. 4.3 Average wage (w ◆) and effort levels (e ■) in the RF treatment

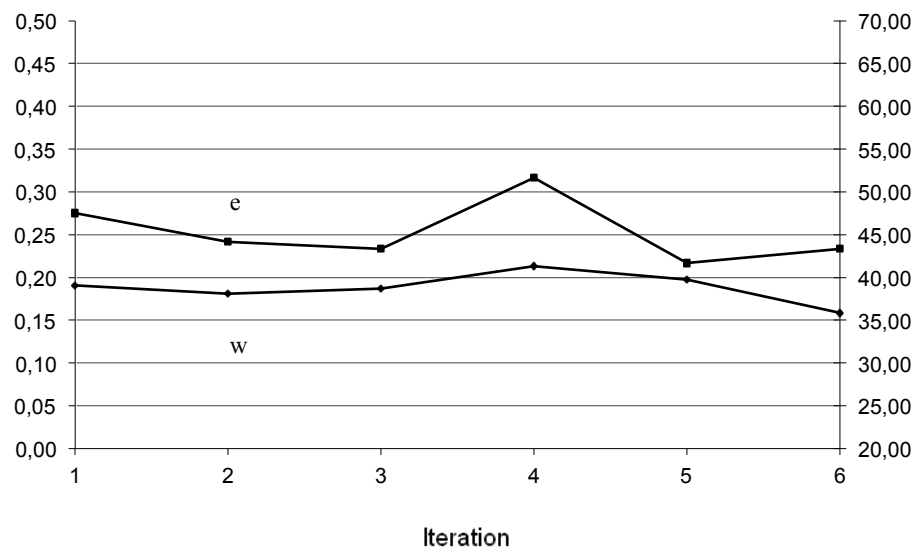


Both average wages and effort levels exceed the sub-game perfect levels predicted through opportunistic behaviour in the repeated game treatment. This

deviation is persistent across all periods. These data show the importance of reciprocity in both a flexible environment and in a repeated game. The workers' behaviour, however, is more cooperative in the repeated game treatment, which shows both the highest average wage (46.21) and the highest effort level (0.35). In order to achieve efficient cooperation, the shared history of employer and employee and the effect on reputation are important. Overall, the workplace welfare level is the best of all treatments (44.75). In other criteria, the highest employee's utility (21.33) and the highest employer's profit (23.42) are in the RF treatment. Flexible governance characterised by function-centred rules and a high level of reciprocity is therefore better suited to the repeated game. However, the highest standard deviation is also in the RF (14.42). Generally, the standard deviation is higher in flexible treatments than in rigid treatments (11.32 OSF > 9.14 OSR and 14.42 RF > 11.15 RR), meaning that rigid treatments are less risky for employers.

Figure 4.4 shows the evolution of average wages and effort levels in the repeated rigid (RR) treatment.

Fig. 4.4 Average wage (w ♦) and effort levels (e ■) in the RR treatment



As in the OSR treatment, average wages exceed the levels predicted under opportunistic behaviour, but average effort levels are under the predicted levels. Reciprocity and reputation mechanisms are unable to raise the effort levels above the minimum enforceable levels ($0.25 < 0.3$). RR treatment is less efficient than RF treatment. The average profit of the employer in the RR treatment is lower

than the average profit in the RF treatment ($20,14 < 23.42$). However, the standard deviation in the RR treatment is lower than the standard deviation in the RF treatment ($11.15 < 14.42$).

Moreover, if table A₅ in appendix I (data from the repeated-flexible treatment) and table A₆ (data from the repeated-rigid treatment) are both examined, the significance of the last iteration and the reputational effects can be seen. Table A₅ reveals the average salary in the sixth iteration is the lowest (41.90) of all the iterations, meaning that there are low effort level expectations. Employers have realised that was an increased probability of a lower effort level while workers may not have any further interest in reciprocation or building a cooperative relationship as it would have no future. The average effort level was also at the lowest of all the iterations (0.20). Consequently, the average earnings of both parties also reached the lowest levels of all iterations (on the sixth iteration the employers earned 12.86 and the workers 19.07, when the average values of the first five iterations were 23.53 and 21.79 respectively). It can therefore be understood that the last iteration drastically reduced the performance and caused the average earnings values to plummet. In this sense, the lack of trust during the last iteration brought about inferior performances.

Similarly, table A₆ also shows that the lowest average salary was also achieved in the last iteration, where it reached a value of 35.87. This average was lower than that of the repeated / flexible treatment, namely 41.90. The effort level in the sixth iteration was also at a very low level (0.23), although this time it was not the lowest (0.22), although it was lower than the average of the previous five iterations (0.26). The average earnings in the last iteration turned out to be 18.82 for employers and 13.02 for workers, both of which lower than the average earnings in the first five iterations, which were 20.48 and 14.58 respectively.

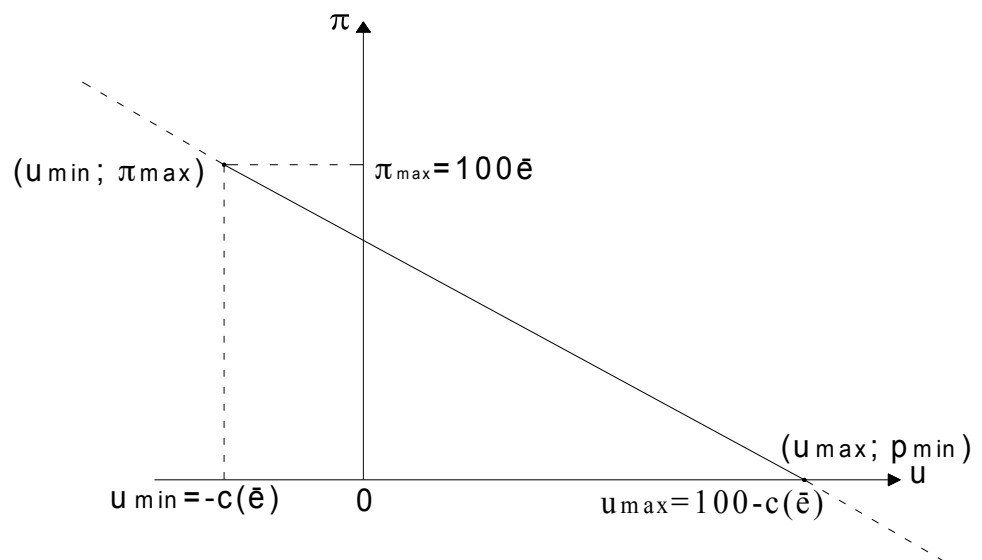
In one-shot treatments, salaries do not reach their lowest levels in the final iteration (see table A₁ A₂ A₃ and A₄ in appendix I), thus demonstrating the profound difference between repeated and one-shot games.

5. Analysis of the Experimental Results in the Payoff Map of the Institutional Gift-Exchange Game

The experimental data show that reciprocity is stronger in flexible treatments than in their rigid equivalents. Furthermore, the positive effects of reciprocity are

stronger in repeated rather than one-shot transactions. With repeated iterations, flexible governance is more efficient than rigid governance, although the former is riskier because if trust fails negative effects are implied. In order to better understand the game and its experimental results, this thesis presents a payoff map. This is a set of possible combinations of the employer's profits (π) and the worker's utilities (u) that are achieved in each period. The map allocates the average levels of workplace welfare (the total amount of players' gains) in the different treatments and directly provides complete information about their efficiency. In this way, a comparison between the points corresponding to the average levels of workplace welfare obtained in the different treatments and the levels predicted under opportunistic behaviour can be made immediately. Furthermore, by tracing the payoff frontier on the map, (i.e. the geometric location of points which correspond to optimal payoffs), the performances of each treatment can be checked. In particular, the map shows the isoeffort lines and the isowage curves. The set of isoeffort lines describe all combination of players' possible gains among which the effort levels (\bar{e}) are identical. Isoeffort lines slope downward to the right (see the isoeffort line in the figure 4.5).

Figure 4.5 - Isoeffort line



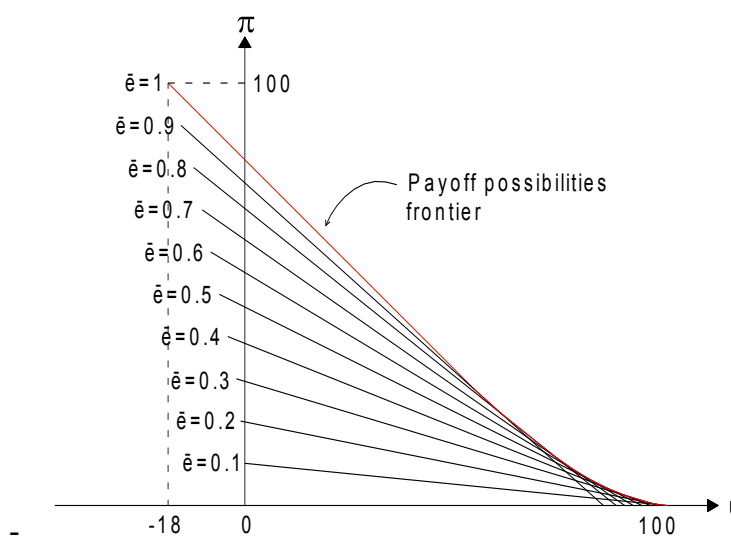
The equation of the isoeffort line is explained in appendix III. The coordinates of the isoeffort lines related to the ten levels of effort are shown in table 4.5 below.

Table 4.5 The coordinates of isoeffort lines

\bar{e}	$u_{\min}(\bar{e})$	$\pi_{\max}(\bar{e})$	$u_{\max}(\bar{e})$	$\pi_{\min}(\bar{e})$
0.1	0	10	100	0
0.2	-1	20	99	0
0.3	-2	30	98	0
0.4	-4	40	96	0
0.5	-6	50	94	0
0.6	-8	60	92	0
0.7	-10	70	90	0
0.8	-12	80	88	0
0.9	-15	90	85	0
1	-18	10 0	82	0

The achievable payoffs coincide with the internal points of the isoeffort lines. These ten lines can be illustrated in a graph, from an initial version of payoff map can be obtained. This may be called the *isoeffort map* (see figure 4.6).

Figure 4.6 - Isoeffort map



The uppermost line in figure 6.6 is obtained by the intersection of ten isoeffort lines. This line may be called the payoff possibilities frontier, and represents the set of efficient points. Each point is a pair of efficient payoffs. The isoeffort (or payoff) map is indicated by M , the frontier by F , a general point on the frontier by P_F , the set of points that are not on the frontier by M' and a general point of M' by $P_{M'}$, then

$$P_F \succ P_{M'} \quad \forall P_F \in F, P_{M'} \in M' \quad \text{with } M = F \cup M'$$

The superior pareto relation between two general points P_1 e P_2 is indicated by \succ , meaning:

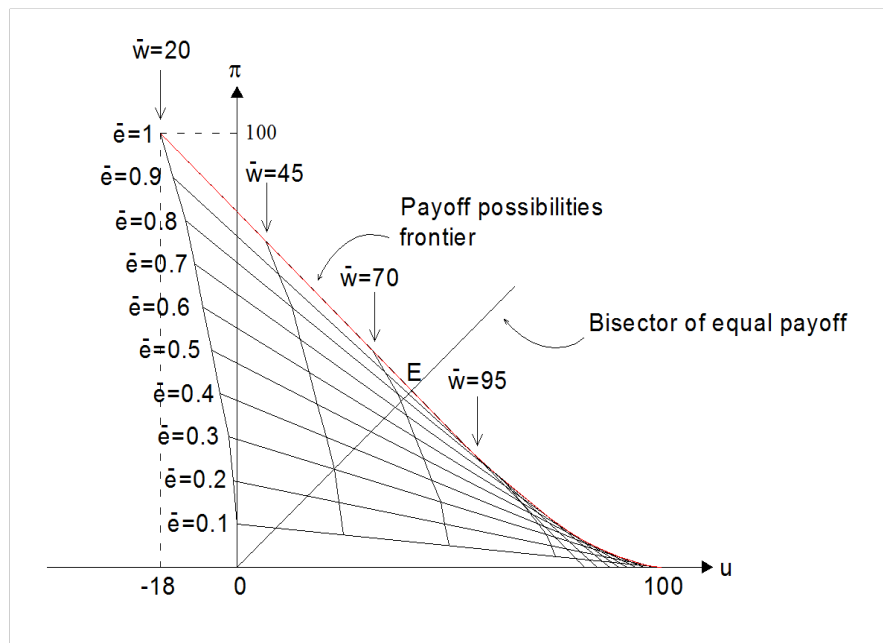
$$P_1(u_1; \pi_1) \succ P_2(u_2; \pi_2) \Leftrightarrow u_1 > u_2 \text{ e } \pi_1 > \pi_2.$$

On the extreme left of the isoeffort lines, the worker's gains are lowest and the employers' highest. At this point the wage is at its minimum (20). In contrast, on the extreme right, the wage is at its maximum (120), meaning the workers' gains are highest and the employer's gains lowest. By moving from the extreme left to the extreme right, the pairs of payoffs are associated with the higher wage

level. In the middle of the isoeffort lines the wage is 70.

Appendix III demonstrates the presence of a geometric property which is interesting for analysing the entire payoff map and for creating the set of isowage curves. This set describes all combinations of players' gains among which the wage level (\bar{w}) is constant. By using a good adaptation index, the isosalary curve can be described as a branch of a parabola with the concave side facing down. If the isoeffort curves and certain "reference" isosalary curves are plotted on the same graph, a complete payoff map, as illustrated in figure 4.7, is created.

Figure 4.7 - Payoff map



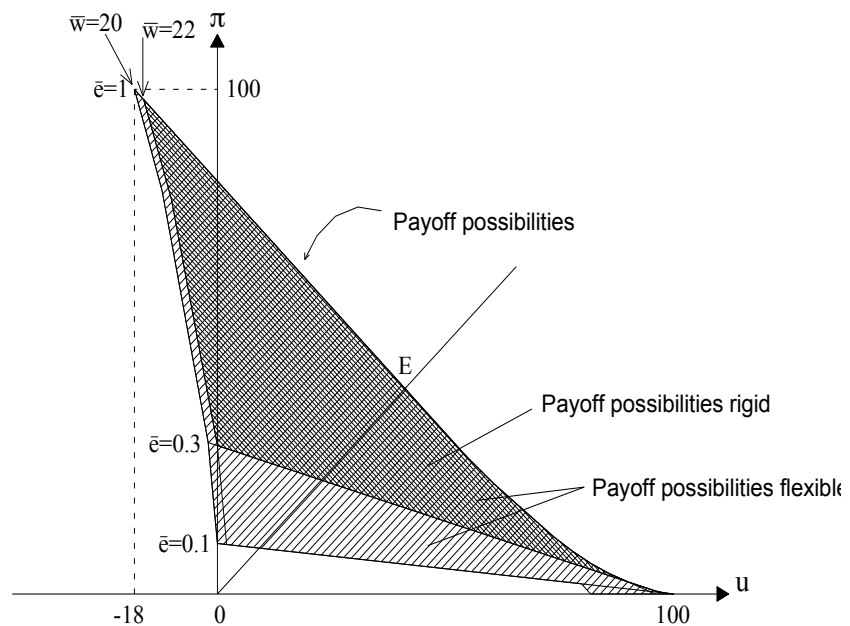
A bisector to the first quadrant, which shall denominate the bisector of equal payoffs, has been added. In geometric terms this refers to the points corresponding to equal payoffs between employer and worker, that is, $u = \pi$. The intersection between the frontier and the bisector, indicated in the graph by E , represents the maximum workplace welfare achievable with equal payoffs for the employer and the employee. Appendix III demonstrates E has coordinates $(\pi=41; u=41)$ and it corresponds to the choices $w = 79$ and $e = e_{\max} = 1$.

The map is an important "topographic" instrument to examine experimental data. The map allows us to directly identify the payoffs of the treatments. More precisely, it shows whether the payoffs are positive or negative; the distance from the levels predicted under opportunistic behaviour; the distance from the efficient

payoff frontier; and finally the distance from the bisector of the equal payoffs. Furthermore, the sequences and the evolution of the game can be read from the map.

In this work, the payoff map is used to suggest the differences between the gift-exchange game with flexible rules and the gift-exchange game with rigid rules. This distinction is an analysis of two different types of treatment used during the course of the economic experiments described in this research. In the experiments with flexible rules, the wage range is [20, 120] and the minimum enforceable effort level is 0.1. In the experiments with rigid rules, the wage range is [22, 120] and the minimum enforceable effort level is 0.3. These differences create two different payoff maps. The payoff map in the rigid environment is a subset of the payoff map in the flexible environment. All the possible payoffs of the rigid treatments are on the right of the isowage line with $\bar{w} = 22$ and above the isoeffort line with $\bar{e} = 0.3$ (see the figure 4.8).

Figure 4.8 Rigid and flexible areas in the payoff map



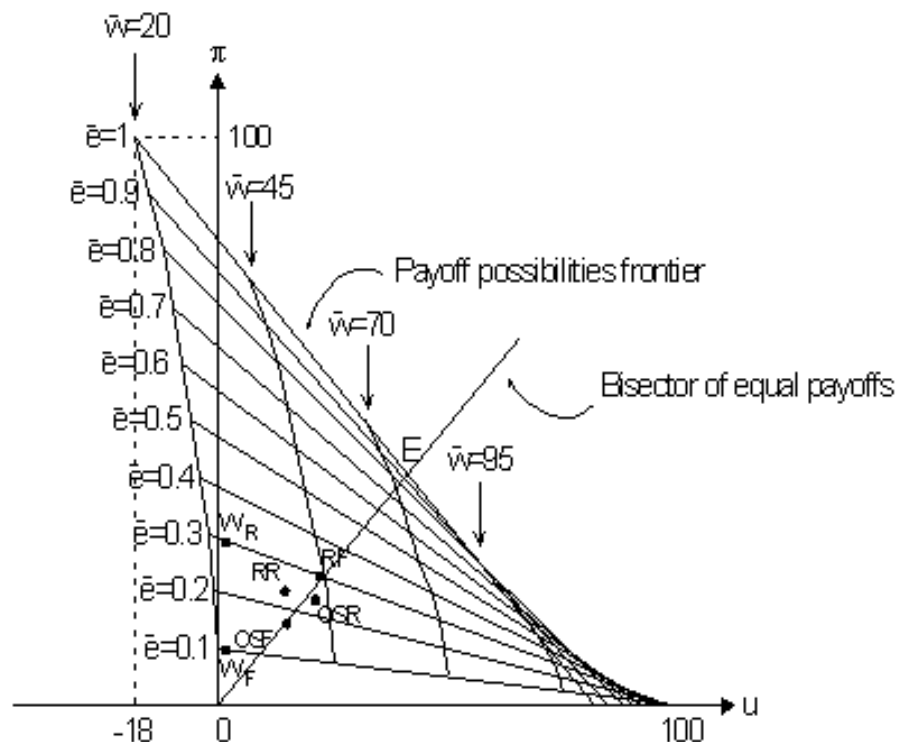
There is a significant overlap of possible payoffs between area R (area of possible payoffs in the rigid environment) and area F (area of possible payoffs in the flexible environment). Only some F payoffs that are less efficient are outside area R. Furthermore, the payoff frontier is roughly common to both areas, with

only a very small and insignificant part of the payoff frontier not falling into area F. This part falls into an area where the worker receives a very low wage and his effort is very high. However, in the experimental results, players never play in such a zone, and as such can be ignored.

Although the experimental core area is potentially accessible in both treatments, F results are considerably different from R results for both relational and institutional reasons. The expected results under opportunistic behaviour and experimental results of previous chapter are shown in the complete payoff map (see figure 4.9)

W_F and W_R are the points corresponding to the levels of workplace welfare predicted under opportunistic behaviour. More precisely, in the flexible area of possible payoffs, W_F is the point corresponding to the levels of effort ($e^*=0.1$) and salary ($w^*=21$). In the rigid area of possible payoffs, W_R is the point corresponding to the levels of effort ($e^*=0.3$) and salary ($w^*=23$). Both levels predicted are very far from the payoff possibilities frontier.

Figure 4.9 Experimental results in the payoff map



Trust based on reciprocity emerges in working relationships characterised by a flexible institutional environment.

OSF is the point corresponding to the average level of workplace welfare

(29) in the one-shot flexible treatment. It has coordinates ($\pi=14.4$; $u=14.60$) and is the point corresponding to the average levels of effort ($e=0.18$) and wage ($w=35.96$). It is closer to the payoff possibilities frontier than the W_F , which is the workplace welfare expected under opportunistic behaviour.

RF is the point corresponding to the average level of workplace welfare (44.75) in the repeated flexible treatment. It has coordinates ($\pi=23.42$; $u=21.33$) and is the point corresponding to the average levels of effort ($e=0.35$) and wage ($w=46.21$). It is the point closest to the payoff possibilities frontier. In other words, the treatment that produced the best results in terms of workplace welfare was the repeated flexible form. Flexibility and repeated iterations support high salaries and effort levels and thus better performances. The greater variability and therefore the greater risk occurs in the repeated flexible culture – the very one which produced the best performances.

Repeated iterations and a flexible environment encourage reciprocity and ensure superior performances. This is all the more true when the parties know that their relationship will be ongoing. However, the average values were also distant from the point E of efficient equity. Furthermore, flexible results are very close to the bisector of equal payoffs. The average differences between the parties' earnings ($\pi-u$) are (-0.20) in the OSF treatment and (2.09) in the RF treatment. The most distant is the RR that is the point corresponding to the average level of workplace welfare (34.45) in the repeated rigid treatment. It has coordinates ($\pi=20.14$; $u=14.31$) and is the point corresponding to the average levels of effort ($e=20.14$) and wage ($w=38.80$). The average differences between employers' average profit and workers' average utility ($\pi-u$) is 5,82 in the RR. It can be seen that in these repeated treatments the differences were more marked and to the advantage of the employers.

As such, in the repeated institutional environments it seems that the worker felt encouraged to send out signals which showed that, to a certain extent, he or she would agree to sacrifice earnings and slightly favour the employer, in order to nudge their salary up to higher levels in later transactions.

OSR, on the other hand, is the point which corresponds to the average level of workplace welfare (39.37) in the one shot rigid treatment. It has coordinates ($\pi=18.52$; $u=20.85$) and is the point corresponding to the average levels of effort ($e=0.26$) and wage ($w=46.18$). The average differences between employers' average profit and workers' average utility ($\pi-u$) is -2.33 in the

OSR. In the one-shot treatments, these differences were more limited and almost always benefit workers significantly.

In summary, rigidity has positive effects in the one-shot environment and negative ones in the repeated environment. Thus we conclude by emphasising the most important outcome of this research, which is that while rigid governance based on task-centred rules and low reciprocity is better suited to one-shot transactions, flexible governance based on function-centred rules and a high level of reciprocity is better suited to repeated transactions.

6. Conclusions

As mentioned above, previous experiments have shown that people are often socially motivated. These behavioural patterns are robust with respect to the data of the flexible treatments of the “institutional gift-exchange Game”. Reciprocity can be a very powerful contract enforcement device. Furthermore, based on previous considerations, it is possible to derive two possible reasons why this thesis uses experiments: they may be designed in such a way that we are able to test Williamson’s assumption of opportunism and his predictions, and they allow us to examine the effect of different institutional environments. Specifically, the “gift-exchange game” has been replicated several times in different versions (one-shot game and repeated game) and under different employment rules (function-centred rules and task-centred rules). On the basis of the different combinations of employment rules and game types, four distinct treatments can be identified: one-shot and repeated games in the rigid environment and one-shot and repeated games in the flexible environment.

The rigid environment relies on task-centred rules that identify job tasks clearly, simply and directly. It offers a stable framework for employers to improve their efficiency in one-shot interactions. In this sense, the rigid system is robust and given conditions of low interpersonal trust may reduce risk. In the flexible system, the employer gives a greater degree of discretion to employees. Function-centred rules are more flexible but less robust than task-centred rules, and rely heavily on high-trust relationships and positive reciprocity. Furthermore, reciprocity takes considerable time (repeated game) and depends on the discretion through which agents make their decisions. Discretion could be one of the crucial conditions of a stable cooperative employment relationship. Having

the opportunity to co-determine the tasks, workers take on their employer's goals and adopt them as their own. Discretion promotes compromise between employer and employees and creates a situation which could turn out better for both parties. The situation being analysed is far from being one where employer and employee can sit together at the same table and specify exactly the payoff contract they desire.

The lesson to be learned from the experimental results is that not even flexible governance can ensure efficient payoffs (in particular in one-shot transactions). However, it is also possible during the course of a repeated game that the parties may have a greater chance to get to know each other, learn how to manage their relationships and send each other signals.

The experimental data from the repeated flexible game confirms this hypothesis, in that the parties achieved superior performances. Discretion and repeated iterations foster reciprocity but do not guarantee stability. Flexible treatments are riskier than the rigid system. The flexible system does not offer a safety net. If spontaneous cooperation based on positive reciprocity stops working, the costs of failed cooperation in this kind of system are more serious than under the rigid system. Rigid governance reduces reciprocity and sacrifices high efficiency in production so as to provide stability in repeated employment interactions. This system restrains exploitation by workers, provides impersonal forms of power and permits stable cooperation in employment relationships.

Conclusions

Conventional reasoning in economics is typically based on the idea that agents have “materialistic” preferences, i.e. their action is exclusively motivated by their material self-interest. This “material self-interest” hypothesis, however, has been systematically rejected by experimental evidence. Indeed, experimental research has shown that individuals often have “social preferences”. Participants in experiments care not only about their own material benefits, but also about other individuals’ material payoffs. Individual’s behaviour is also driven by altruistic preferences and preferences for equality. (Fehr and Schmidt, 1999; Andreoni and Miller 2002).

Furthermore, experiments demonstrate that human beings are affected not only by selfish motives but also by the norms of reciprocity (Fehr *et al.*, 1993; 1997; Fehr and Falk, 1999; Fehr and Gächter, 2000; Falk and Gächter, 2002; Croson 1996; Guth, Klose, Königstein and Schwalbach, 1998; Keser and van Winden, 2000). Some authors argue that reciprocity is a significant contract enforcement device in the presence of incomplete labour contracts (Akerlof, 1982; Akerlof and Yellen, 1990). In particular, Fehr *et al.* (1993) show a version of the gift exchange game that they apply to analyse the possible role of reciprocity in employment contracts. In their experiments, workers are frequently much nicer and more cooperative in response to employer’s friendly actions than is generally predicted by transaction cost economics.

Thus, economic agents may deviate from purely self-interested behaviour in a reciprocal manner. They make repayments for gifts or take revenge, even in interactions with complete strangers, even if this is costly and yields neither present nor future material rewards. Our notion of reciprocity is, thus, very different from friendly or hostile responses in repeated interactions that are motivated solely by future material gains. Reciprocity means that individuals are willing to reply positively to kind behaviour and to respond negatively to hostile behaviour, even though rewards or punishment may reduce their material payoff.

It is very important to build up personal contacts and reciprocal obligations. Reciprocity may produce outcomes that have important implications for the way economic behaviour changes and it represents a complementary instrument for maintaining cooperation. The threat of sanctions increases the chances of

cooperation between people who have mutual friends. The shame deriving from cheating a long-standing friend may be significant even when it is not discovered if the friend becomes aware of it, the shame will only increase.

Trusting the other party, investing in reciprocity or accomplishing the informal agreement does not necessarily lead to the increased vulnerability of the agent in cases of opportunistic actions by their partner (who may feel less closely monitored given the increased level of trust placed in them by their counterpart). The explanation for this is that when a person's positive expectations are not shared, the result can be behaviour more extreme than that resulting from the tit-for-tat policy analysed in the model. Reciprocity has a complementary function with respect to economic incentives. Economic agents who feel betrayed, swindled or offended may undertake punitive actions even when these do not benefit them economically. For this reason it is likely that the other party will be more reluctant to diverge from the agreement, even if driven by opportunistic motives, given the other party's threat to return the damage done, regardless of the costs and opportunities deriving from that. Furthermore, the other party is affected by moral concerns, such as integrity, commitment, "doing the right thing", honour and self-image. The reciprocal relationship is seen as too special to be driven only by material rewards. If people receive too much benefit, they are not inclined to return it, but rather can be influenced by feelings of uneasiness or even guilt.

To understand phenomena such as trust and reciprocity, it is therefore important to accept the relevance of morality. Parties give a non-instrumental significance to the reciprocal relationship. Furthermore, they give it a value in itself and perceive costs, benefits and equivalence from a long-run perspective. A kind of equilibrium is always present, albeit one which is more "It will all work out" than one where there is a sense of determined risk (O'Connell, 1984).

In addition, social motivation and moral claims are not explained in terms of utility function; rather, they have developed over the course of more than million years (Darwin, 1871) and are emotionally empowered (Mackie 1977, Joyce 2006). Their evolution does not rely only on norms, but they are also social phenomena consisting of inescapable rules created by emotion. For Hodgson (2012), the moral nature of human beings is, therefore, a social phenomenon that relies both on social conditions and on biological development. People are a social species, with emotional, linguistic, and deliberative strengths. The emotional fuel of morality and parts of our rule-structure go back to our ape-like predecessors

(De Waal 1996, 2006). While some scholars maintain that cultures gives a sufficient explanation of social motives and cooperation, other researchers, argue that this kind of cultural explanation is insufficient since it fails to explain the origins of social norms. Hodgson (2012) supposes that biology may confirm the cultural explanation because it helps us to understand how culture develops and what pre-cultural disposition provided it with the first form.

Social motives are partly inherited and have partly evolved according to cultural conditions. They are the result of a long evolutionary phase and the enculturation of humans. Inclusive fitness, kin altruism and genetic group selection are significant factors which explain the evolutionary origins of prosociality. Human culture is also crucial for the evolution of social preferences. Thus, to properly understand prosociality, both genetic and cultural mechanisms are required. A number of experiments (for example see Bowles 1998, 2004, Field 2001 and Fehr and Fischbacher 2002) have been made with the very purpose of finding an explanation for prosociality in big groups. "Social preferences" or "other-regarding preferences" may not be only related to family and relatives and other small groups, but may be explained in terms of biological inheritance (Field 2001, 2007, 2008). Altruistic and cooperative behaviour has a cultural embeddedness, but it also has a biological basis and the phenomenon involved is genetic group selection (cfr. Bowles, S. and Gintis, H., 2005).

The experimental evidence presented in this thesis indicates that Williamson's position on trust is not, in many cases, confirmed. Organisations are made up not only of self-interested types but also of reciprocal types, interacting with each other. The experimental evidence proves that there are important conditions in which the economic theory based only on opportunism is refuted. While the self-interest model predicts no cooperation at all, in the gift-exchange game, reciprocity matters. Experimental results show reciprocity can ensure more efficient payoffs. The existence of reciprocal types may actually give rise to organisations with incomplete contracts, so that reciprocity helps to generate those conditions under which it can flourish. Furthermore, this thesis goes beyond the gift-exchange game developed by Fehr and other economists (Fehr *et al.*, 1993; Falk and Gächter, 2002) and demonstrates that the power of reciprocity depends on the details of the normative environment of employment relationships. Institutional changes can modify the habits of thought and behaviour and create individual perceptions, preferences and intentions.

In the institutional gift-exchange game, I derive two distinct clusters of job characteristics based on two fundamentally distinct governance structures: the rigid governance structure and the flexible governance structure. More precisely, the “institutional gift-exchange game” has been replicated several times in different versions. The four treatments of the institutional gift-exchange game are: the one-shot flexible treatment (one-shot interactions and flexible rules); the repeated flexible treatment (with repeated interactions and flexible rules); the one-shot rigid treatment (with one-shot interactions and rigid rules) and the repeated rigid treatment (with repeated interactions and rigid rules). On the basis of the different combinations of the two kinds of employment rules, and one-shot and repeated game, the institutional gift-exchange game helps to understand the interplay between relational mechanisms and normative arrangements in employment relationship theory. The combination of transaction rules and reciprocity mechanisms provides a foundation for employment cooperation, and ensures that both parties achieve some of the key benefits they seek.

Under the rigid governance structure, employers offer wages to workers in an institutional environment characterised by limited discretion and a high minimum effort level (0.3). Under the flexible governance structure, employers offer wages in an institutional environment characterised by high discretion and low minimum effort level (0.1). In the flexible governance structure, employers pay high wages that grant a high share of the surplus; in doing so they run a significant risk, since a considerable amount of trust on the part of the employer is required. If the employee is not trustworthy, the employer incurs a significant loss, which thereby raises questions of viability regarding the flexible governance structure.

In the institutional gift-exchange game, the treatment which provided the best results in terms of workplace welfare (profit and salary jointly) was the repeated flexible treatment. The average values for salaries, effort levels and profits were not only higher than in the repeated rigid treatment, but in general were the highest of all. Flexibility and repeated iterations were shown to promote better performance. The treatment which produced the lowest results in terms of workplace welfare was the one-shot flexible treatment, since reciprocity takes time to develop and produce high performance.

This thesis shows, experimentally, that offering discretion to employees is not profitable by itself. Under a flexible governance structure, a high wage offer

must be combined with repeated interactions in order to increase the level of the workers' effort. Experimental findings showed a positive relationship between flexible arrangements and reciprocity in repeated interactions: institutional flexibility has a positive impact on collective performances. This was true for the organizational performance (employer's profit) as well as the worker's salary. Flexible working is seen as a positive factor in achieving stable cooperation in repeated interactions. The main psychological mechanism that underlies these relationships is that discretion confers self-determination and intrinsic motivation, which are key ingredients for trust in reciprocity. Giving workers many options in problem-solving tasks can lead to an effort above the minimum effort level.

Reciprocity in one-shot interactions is risky. A treatment with more rigid rules actually works better. Indeed, in the one-shot rigid treatment workplace welfare was higher than in the one-shot flexible treatment. Generally, rigid treatments (both one-shot and repeated) are less risky for managers than flexible treatments (both one-shot and repeated). The mean square deviation is inferior in both treatments.

Overall, two distinct governance patterns for managing relationships emerge: the rigid governance structure and the flexible governance structure. Both systems of governance attempt to improve the efficiency and stability of employment relationships. It is unlikely that the performance of one is absolutely superior to the other. In opposition to the flexible structure, the rigid governance system is characterised by task-centred rules that identify job tasks in a straight, simple and clear way. Under this system, the level of trust based on reciprocity is very low. As a result, rigid repeated treatments achieve lower performances than flexible repeated ones, as shown by our experimental results. This management system is not very flexible in that the parties have little discretion about how to react to swift changes in an uncertain environment. The power of the manager is based on specific norms that provide a committed framework of employment relationships. In other words, this system restrains exploitation of the workers by providing an impersonal form of power. The institutional environment is viewed as playing a crucial role in shaping individual actions. The detailed employment rules applied in this management system are sufficiently stable so as to build a secure agreement leading to cooperation between firms and workers. The results show that in one-shot transactions (OSR treatment) rigid governance reduces risk (the mean square deviation is the lowest one). Compared to the flexible one-shot

treatment, the rigid one-shot treatment improves efficiency and achieves higher welfare in the workplace.

To sum up, to see the connection between reciprocity and various institutions, it is very important to understand organisational performance. Disseminating positive relational signals throughout an organisation's membership in order to develop a trusting environment, rather than merely relying on economic incentives, is an alternative way of establishing stable cooperation between managers and workers. The nature of economic relationships between agents is dynamic, and requires a type of cooperative agreement needing to be updated over time which has the capacity to adapt itself when the agents involved in the collaboration change their objectives.

Agents will continually search for confirmation from the positive signals given out by the cooperative behaviour of the other party. Such information on the actions and omissions on the part of businesses are the relational signals, that is, the signals carrying information about the nature and intentions of the agents. It is a requirement that both parties continually signal their intention to conform to the rules. Signalling is acting in a manner that demonstrates one's intentions, abilities or some other characteristics of the person to others, in cases where the person has private information which is not verifiable (Milgrom and Roberts, 1988; 1992). If the other party sends positive relational signals it is possible to derive that they have a cooperative predisposition and, therefore, that they may collaborate. The more positive the signals, the more stable the employment relationship. Furthermore, by means of these signals the agent can also check up on other contractual behaviours and thus economise.

In any case, the economic agent will not be limited to simply checking but, *ex-ante*, they will try to convince their partner of their intentions from the outset of the contractual relationship. This means that during the negotiation process and the checking of the contract's terms and conditions, they will try to establish compatible expectations. Once such a relationship has been initiated, the company will try to maintain the cooperative attitude of its partner. Above all, this involves credibly and consistently demonstrating a concern for the general norms of relational exchanges, such as discretion.

The value of the relational signal is positively correlated to the level of discretion. Such signals need to be given out in a flexible institutional environment in order to create cohesion inside the firm. This is the reason why

networks designed around informal flexible rules and trusting relationships are so important, even though its significance is not recognised by transaction cost economics. The failure and the decline of performance in many organisations may be identified with the diminution of discretion. Organisations based on task centred rules reduce discretion, limit opportunities for reciprocity and diminish organisational performance. Nevertheless, the flexible governance structure is characterised by function centred rules and avoids any direct connection to the tasks workers carry out. They operate at an inter-personal level, and the relationship is dominated by either trust or power.

Function-centred rules need to be enforced by reciprocity, but this mechanism takes time to build up and solidify. Positive reciprocity thus grows more rapidly in experiments with more discretion and repeated transactions (RF treatment). Discretion fosters reciprocity but does not guarantee stability. This kind of governance is more fragile, more vulnerable and less robust than the rigid governance system, because the function-centred rules on which they rely are partially unstable, as demonstrated by the results of our experiment. The flexible system does not offer a safety net. If spontaneous cooperation based on positive reciprocity stops working, the consequences of failed cooperation in this kind of system are graver than under the rigid system. When understandings and expectations are violated through opportunistic behaviour, trust is weakened and is very difficult to be rebuilt.

Nevertheless, if employers have the opportunity to punish workers in this situation, then reciprocal manager types vigorously punish freeriders in the workforce, even when the punishment is costly for the punisher. The consequence of such behaviour is a very high level of effort achieved by workers: cooperation and high performances can, in fact, be achieved. These results show that in organisations characterised by function-centred rules, members spontaneously respect agreements not only because they improve expected earnings, but also because they are affected by relational mechanisms such as reciprocity. In this kind of organisation, members perceive discretion, flexible rules and agreements as being cooperative, where their objective is to achieve an outcome that benefits all those who are party to the contract, on condition that each fulfils their role (set of actions) even when, for particular actions, it would be to their advantage not to cooperate.

The mutual aspect of trust presented by Fox (1974, 1985) means that if the structures, roles and inflexible employment rules convey an absence of trust in workers by the employer, workers will respond with distrust. Similarly, where management transmits a high degree of trust to its workers, the latter will also respond with high levels of trust in management. Thus, the role of management includes the formation and running of a system conducive to trust described by Fox (1974, 1985) as “institutionalized” trust, which does not refer to levels of trust or distrust that are expressed in personal attitudes between individuals. Flexible tasks increase the likelihood of worker cooperation and thus their productivity. Work may be arranged to ensure that workers act on their own initiative and “own” their work; close supervision is replaced by trust, which, in turn leads to reciprocity and thus cooperation.

Discretion in the workplace, in its broadest sense, is the possibility for workers and employers to implement modifications with regard to time, place and the way work is done in order to create a better equilibrium between personal needs and business demands. Flexible work arrangements can enable workers find a better equilibrium between their personal and business obligations, thus developing a greater sense of wellbeing and contentment. As a result, this leads to increased productivity, less absenteeism and reduced turnover. Furthermore, several authors have analysed the positive correlation between high discretion and “high performance” work practices (Karasek 1979, Parker and Wall 1998, Singh, 2000, Parker 2003). Research on worker satisfaction has tended to find that discretion decreases work stress, in particular when job demands are high, and the literature on efficiency concludes that work practices which promote higher degrees of discretion promote increased performance (Appelbaum, Bailey, Berg and Kalleberg 2000)

Managers should notice that flexibility requires a management style based on trust and an organisational culture centred on job creativity. The experimental outcomes of this thesis ask us to think about work in new and different ways. They can be applied as a mechanism to form better approaches to achieving business results in a proactive manner. It is better to think "outside the box" in a creative way when answering the question as to how jobs can be reformed to meet and surpass business targets.

Trust based on reciprocity between managers and workers is essential for performance managed by results, and is a core requirement for flexible work

arrangements. Some employers may find it difficult to acknowledge that workers are genuinely at work when they are out of sight. Nevertheless, empowering workers and increasing their involvement is crucial for providing uninterrupted improvement in productivity. This may not be easy where levels of trust are not high. However, a low level of trust often correlates with a low level of worker engagement due to insufficient motivation. It has been shown that increased flexibility has created higher levels of motivation, which therefore creates engagement and forms the conditions in which flexibility can flourish. Flexibility is not an inherent worker's benefit but rather an obtained status by means of maintaining trusting relations with one's manager. Taking into account the nature of flexible work arrangements, there is much less management control and observation compared to situations where the employee is physically present. Consequently, it is highly important that managers show trust towards worker's integrity and intentions: trust is a prior condition for working flexibly and crucial for ensuring completely satisfying and elastic work conditions.

Trust is not only founded on the material interests of individuals, but it may also be based on reciprocity and on the institutional context in which the relationships are embedded (Nooteboom 2002; Sheppard and Sherman 1998). Flexible informal rules are crucial in an environment based on trust and philia-reciprocity and make employment relationship more efficient. In addition, a stable employment relationship must ensure that parties are always prepared to restrain the pursuit of their own self-regarding interests. Any guarantee that the other party will not defect does not result from economic incentives but from the fact that each sends the other positive signals. Therefore, we conclude that creating trust based on reciprocity is a mutual process that requires bilateral effort, signals, and engagement.

Appendix I

Experiment Tables

Tables A₁, A₂, A₃, A₄, A₅ and A₆ present the general data collected during the experiments. Specifically, they show the data regarding the salaries, effort levels, and employers' and workers' profits relative to every transaction completed.

For one-shot treatments (tables: A1 A2, A3 and A4), the data are presented in a twofold view: one for employers' profiles, in which one follows a row to read the data relative to the same employer during the course of six iterations, and the other for workers' profiles, in which one row shows the data for a single worker.

For repeated transactions the data (tables A5 and A6) are presented for pairs of subjects, and thus there is no issue in presenting double sets of data. The representation in tabular form means the columns can be read to find the averages and variants of each iteration. Reading across the rows shows the average and variant values for employers, workers or pairs of employers and workers. The squares picked out in black show the global values of the average and variant values of salaries, effort levels and earnings relative to each treatment. In the case where the worker refused the contract, the effort level was entered as 0, and this value is included in the average and variant calculations.

Table A1 Data OSF treatment employer's profile		Iteration						Average	σ^2
		1	2	3	4	5	6		
1	W e π u	35	2,7	30,5	40	24	22,9	29,85	37,07
		0,1	0,5	0,1	0,1	0,2	0	0,17	0,03
		8,5	46,7	9,0	8,0	19,2	0,0	15,22	228,66
		15,0	0,7	10,5	20,0	3,0	0,0	8,20	56,88
2	W e π u	40	28	27	27	27	27	29,33	22,89
		0,1	0,1	0,2	0,2	0,2	0,1	0,15	0,00
		8,0	9,2	18,6	18,6	18,6	9,3	13,72	24,02
		20,0	8,0	6,0	6,0	6,0	7,0	8,83	25,47
3	W e π u	34,1	24,1	23,9	21,7	22,3	23,9	25,00	17,37
		0,1	0,1	0,3	0	0,1	0,2	0,13	0,01
		8,6	9,6	28,8	0,0	9,8	19,2	12,67	83,19
		14,1	4,1	1,9	0,0	2,3	2,9	4,22	21,04
4	W e π u	60	30	35	35	30	25	35,83	128,47
		0,2	0,4	0,5	0,1	0,1	0,1	0,23	0,03
		12,0	36,0	42,5	8,5	9,0	9,5	19,58	198,12
		39,0	6,0	9,0	15,0	10,0	5,0	14,00	135,33
5	W e π u	60	35,5	35,5	35,5	35,5	45	41,17	82,97
		0,2	0,8	0,1	0,1	0,1	0,1	0,23	0,07
		12,0	67,6	8,5	8,5	8,5	7,5	18,74	479,45
		39,0	3,5	15,5	15,5	15,5	25,0	19,00	118,83
6	W e π u	48,5	55,9	48,5	42,1	34,1	29,1	43,03	83,36
		0,4	0,2	0,1	0,1	0,1	0,1	0,17	0,01
		28,6	12,8	7,2	7,8	8,6	9,1	12,34	56,15
		24,5	34,9	28,5	22,1	14,1	9,1	22,20	73,92
7	W e π u	35	20	29	38	35,4	35	32,07	36,42
		0,3	0	0,1	0,2	0,3	0,1	0,17	0,01
		25,5	0,0	9,1	16,4	25,4	8,5	14,15	86,27
		13,0	0,0	9,0	17,0	13,4	15,0	11,23	31,07
8	W e π u	33	23	40	40	40	38	35,67	38,22
		0,1	0	0,2	0,3	0,1	0,2	0,15	0,01
		8,7	0,0	16,0	24,0	8,0	16,4	12,18	58,34
		13,0	0,0	19,0	18,0	20,0	17,0	14,50	46,92
9	W e π u	51	32,5	25	40	35	45	38,08	71,70
		0,1	0,1	0	0,2	0,1	0,3	0,13	0,01
		6,9	8,8	0,0	16,0	8,5	22,5	10,44	50,75
		31,0	12,5	0,0	19,0	15,0	23,0	16,75	91,48
10	W e π u	51	22	22	29,5	30,6	52	34,52	155,20
		0,2	0,3	0	0,1	0,1	0,2	0,15	0,01
		13,8	29,4	0,0	9,1	8,9	13,6	12,47	78,22
		30,0	0,0	0,0	9,5	10,6	31,0	13,52	161,23
11	W e π u	40	50	30	28,3	50	50	41,38	87,57
		0,3	0,2	0,1	0	0,3	0,3	0,20	0,01
		24,0	14,0	9,0	0,0	21,0	21,0	14,83	69,14
		18,0	29,0	10,0	0,0	28,0	28,0	18,83	117,47
12	W e π u	57	46	37	30	55	48	45,50	90,25
		0,3	0,2	0,1	0,1	0,4	0,3	0,23	0,01
		18,9	14,8	8,3	9,0	26,0	21,6	16,43	41,40
		35,0	25,0	17,0	10,0	31,0	26,0	24,00	70,00
Average	W e π u	45,38	32,81	31,95	33,93	34,91	36,74	35,95	
		0,20	0,24	0,15	0,13	0,18	0,17	0,18	
		14,62	20,73	13,07	10,48	14,29	13,18	14,40	
		24,30	10,31	10,53	12,68	14,08	15,75	14,61	
σ^2	W e π u	99,11	127,61	53,11	38,49	86,81	110,34		106,02
		0,01	0,05	0,02	0,01	0,01	0,01		0,02
		53,90	381,67	135,31	46,63	47,05	44,93		128,04
		94,01	141,22	65,25	52,17	72,83	106,46		111,05

Table A2 Data OSF treatment employee's profile		Iteration						Average	σ^2
		1	2	3	4	5	6		
1	W	35	55,9	35,5	35	22,3	27	35,12	110,38
	e	0,1	0,2	0,1	0,1	0,1	0,1	0,12	0,00
	π	8,5	12,8	8,5	8,5	9,8	9,3	9,56	2,37
	u	15,0	34,9	15,5	15,0	2,3	7,0	14,95	103,59
2	W	40	26,7	48,5	35,5	30	23,9	34,10	69,96
	e	0,1	0,5	0,1	0,1	0,1	0,2	0,18	0,02
	π	8,0	46,7	7,2	8,5	9,0	19,2	16,41	199,52
	u	20,0	0,7	28,5	15,5	10,0	2,9	12,93	92,96
3	W	34,1	28	30,5	42,1	35,5	25	32,53	30,70
	e	0,1	0,1	0,1	0,1	0,1	0,1	0,10	0,00
	π	8,6	9,2	9,0	7,8	8,5	9,5	8,75	0,31
	u	14,1	8,0	10,5	22,1	15,5	5,0	12,53	30,70
4	W	60	24,1	27	40	34,1	45	38,37	144,27
	e	0,2	0,1	0,2	0,1	0,1	0,1	0,13	0,00
	π	12,0	9,6	18,6	8,0	8,6	7,5	10,71	14,55
	u	39,0	4,1	6,0	20,0	14,1	25,0	18,03	141,07
5	W	60	30	23,9	27	24	29,1	32,33	158,39
	e	0,2	0,4	0,3	0,2	0,2	0,1	0,23	0,01
	π	12,0	36,0	28,8	18,6	19,2	9,1	20,62	86,22
	u	39,0	6,0	1,9	6,0	3,0	9,1	10,83	164,04
6	W	48,5	35,5	35	21,7	27	22,9	31,77	84,51
	e	0,4	0,8	0,5	0	0,2	0	0,32	0,08
	π	28,6	67,6	42,5	0,0	18,6	0,0	26,22	569,34
	u	24,5	3,5	9,0	0,0	6,0	0,0	7,17	70,22
7	W	35	46	30	29,5	35	38	35,58	30,53
	e	0,3	0,2	0,1	0,1	0,1	0,2	0,17	0,01
	π	25,5	14,8	9,0	9,1	8,5	16,4	13,88	36,38
	u	13,0	25,0	10,0	9,5	15,0	17,0	14,92	27,20
8	W	33	20	37	28,3	30,6	45	32,32	59,01
	e	0,1	0	0,1	0	0,1	0,3	0,10	0,01
	π	8,7	0,0	8,3	0,0	8,9	22,5	8,07	56,61
	u	13,0	0,0	17,0	0,0	10,6	23,0	10,60	70,87
9	W	51	23	29	30	50	52	39,17	145,14
	e	0,1	0	0,1	0,1	0,3	0,2	0,13	0,01
	π	6,9	0,0	9,1	9,0	21,0	13,6	9,93	40,89
	u	31,0	0,0	9,0	10,0	28,0	31,0	18,17	151,14
10	W	51	32,5	40	38	55	50	44,42	64,87
	e	0,2	0,1	0,2	0,2	0,4	0,3	0,23	0,01
	π	13,8	8,8	16,0	16,4	26,0	21,0	16,99	29,44
	u	30,0	12,5	19,0	17,0	31,0	28,0	22,92	50,03
11	W	40	22	25	40	35,4	48	35,07	81,36
	e	0,3	0,3	0	0,3	0,3	0,3	0,25	0,01
	π	24,0	29,4	0,0	24,0	25,4	21,6	20,73	91,44
	u	18,0	0,0	0,0	18,0	13,4	26,0	12,57	92,67
12	W	57	50	22	40	40	35	40,67	122,56
	e	0,3	0,2	0	0,2	0,1	0,1	0,15	0,01
	π	18,9	14,0	0,0	16,0	8,0	8,5	10,90	38,77
	u	35,0	29,0	0,0	19,0	20,0	15,0	19,67	121,89
Average	W	45,38	32,81	31,95	33,93	34,91	36,74	35,95	
	e	0,20	0,24	0,15	0,13	0,18	0,17	0,18	
	π	14,62	20,73	13,07	10,48	14,29	13,18	14,40	
	u	24,30	10,31	10,53	12,68	14,08	15,75	14,61	
σ^2	W	99,11	127,61	53,11	38,49	86,81	110,34		106,02
	e	0,01	0,05	0,02	0,01	0,01	0,01		0,02
	π	53,90	381,67	135,31	46,63	47,05	44,93		128,04
	u	94,01	141,22	65,25	52,17	72,83	106,46		111,05

Table A3 Data OSR treatment employer's profile		Iteration						Average	σ^2
		1	2	3	4	5	6		
1	W	45,5	40,5	44	43,7	43	43,9	43,43	2,28
	e	0,3	0	0,3	0,3	0,3	0,3	0,25	0,01
	π	22,4	0,0	22,8	22,9	23,1	22,8	19,00	72,21
	u	23,5	0,0	22,0	21,7	21,0	21,9	18,35	67,90
2	W	44	40	45	44,1	52,3	45,1	45,08	13,34
	e	0,3	0	0,3	0,3	0,3	0,3	0,25	0,01
	π	22,8	0,0	22,5	22,8	20,3	22,5	18,48	69,00
	u	22,0	0,0	23,0	22,1	30,3	23,1	20,08	88,84
3	W	53	50	40	38	42,8	43,4	44,53	28,18
	e	0,5	0,3	0	0	0,3	0,3	0,23	0,03
	π	33,5	21,0	0,0	0,0	23,2	23,0	16,77	156,61
	u	27,0	28,0	0,0	0,0	20,8	21,4	16,20	138,16
4	W	40	60	37	43	44,6	44,5	44,85	53,05
	e	0,3	0,3	0	0	0,3	0,3	0,20	0,02
	π	24,0	18,0	0,0	0,0	22,6	22,7	14,55	109,22
	u	18,0	38,0	0,0	0,0	22,6	22,5	16,85	180,25
5	W	41,5	50	42	32,1	46,7	43	42,55	30,59
	e	0	0,3	0	0	0,3	0,3	0,15	0,02
	π	0,0	21,0	0,0	0,0	22,0	23,1	11,02	121,70
	u	0,0	28,0	0,0	0,0	24,7	21,0	12,28	154,97
6	W	36	37,5	43,5	42,5	42,3	43,8	40,93	9,21
	e	0,3	0	0,3	0,3	0,3	0,3	0,25	0,01
	π	25,2	0,0	23,0	23,3	23,3	22,9	19,60	77,41
	u	14,0	0,0	21,5	20,5	20,3	21,8	16,35	60,32
7	W	44,9	58	79	44,6	44,9	34,3	50,95	204,54
	e	0,3	0,3	0,3	0,3	0,3	0	0,25	0,01
	π	22,5	18,6	12,3	22,6	22,5	0,0	16,43	67,41
	u	22,9	36,0	57,0	22,6	22,9	0,0	26,90	293,82
8	W	43	51,2	44	40	80	42,1	50,05	191,47
	e	0,3	0,3	0,3	0,3	0,7	0,3	0,37	0,02
	π	23,1	20,6	22,8	24,0	28,0	23,4	23,65	4,87
	u	21,0	29,2	22,0	18,0	50,0	20,1	26,72	120,49
9	W	48,4	50	55,5	62	50	78	57,32	106,60
	e	0,3	0,3	0,3	0,4	0,3	0,3	0,32	0,00
	π	21,5	21,0	19,4	23,2	21,0	12,6	19,77	11,55
	u	26,4	28,0	33,5	38,0	28,0	56,0	34,98	104,03
10	W	40	43	38	43	42	43,8	41,63	4,07
	e	0,3	0,3	0	0,3	0	0,3	0,20	0,02
	π	24,0	23,1	0,0	23,1	0,0	22,9	15,51	120,41
	u	18,0	21,0	0,0	21,0	0,0	21,8	13,63	94,34
11	W	55,2	49,5	44,2	43,4	44,6	42	46,48	20,57
	e	0,5	0,3	0,3	0,3	0,3	0,3	0,33	0,01
	π	32,4	21,2	22,7	23,0	22,6	23,4	24,22	13,88
	u	29,2	27,5	22,2	21,4	22,6	20,0	23,82	11,17
12	W	50	48,5	44,5	45	46	44	46,33	4,81
	e	0,4	0,3	0,3	0,3	0,3	0,3	0,32	0,00
	π	28,0	21,5	22,7	22,5	22,2	22,8	23,27	4,67
	u	26,0	26,5	22,5	23,0	24,0	22,0	24,00	2,92
Average	W	45,13	48,18	46,39	43,45	48,27	45,66	46,18	
	e	0,32	0,23	0,20	0,23	0,31	0,28	0,26	
	π	23,28	15,50	14,01	17,28	20,90	20,16	18,52	
	u	20,67	21,85	18,64	17,36	23,93	22,63	20,85	
σ^2	W	29,41	43,65	116,26	43,34	100,38	102,30		75,43
	e	0,01	0,02	0,02	0,02	0,02	0,01		0,02
	π	63,46	81,57	106,16	99,61	42,90	45,10		83,48
	u	56,24	176,26	263,29	122,54	112,18	137,14		149,74

Table A4 Data OSR treatment employee's profile		Iteration						Average	σ^2
		1	2	3	4	5	6		
1	W	45,5	37,5	42	43	42,8	45,1	42,65	6,87
	e	0,3	0	0	0	0,3	0,3	0,15	0,02
	π	22,4	0,0	0,0	0,0	23,2	22,5	11,33	128,43
	u	23,5	0,0	0,0	0,0	20,8	23,1	11,23	126,90
2	W	44	40,5	43,5	32,1	44,6	43,4	41,35	18,78
	e	0,3	0	0,3	0	0,3	0,3	0,20	0,02
	π	22,8	0,0	23,0	0,0	22,6	23,0	15,23	115,91
	u	22,0	0,0	21,5	0,0	22,6	21,4	14,58	106,49
3	W	53	40	44	42,5	46,7	44,5	45,12	16,55
	e	0,5	0	0,3	0,3	0,3	0,3	0,28	0,02
	π	33,5	0,0	22,8	23,3	22,0	22,7	20,70	101,45
	u	27,0	0,0	22,0	20,5	24,7	22,5	19,45	79,96
4	W	40	50	45	43,7	42,3	43	44,00	9,50
	e	0,3	0,3	0,3	0,3	0,3	0,3	0,30	0,00
	π	24,0	21,0	22,5	22,9	23,3	23,1	22,80	0,85
	u	18,0	28,0	23,0	21,7	20,3	21,0	22,00	9,50
5	W	41,5	60	40	44,1	43	43,8	45,40	44,59
	e	0	0,3	0	0,3	0,3	0,3	0,20	0,02
	π	0,0	18,0	0,0	22,8	23,1	22,9	14,46	107,50
	u	0,0	38,0	0,0	22,1	21,0	21,8	17,15	180,65
6	W	36	50	37	38	52,3	43,9	42,87	41,03
	e	0,3	0,3	0	0	0,3	0,3	0,20	0,02
	π	25,2	21,0	0,0	0,0	20,3	22,8	14,89	113,25
	u	14,0	28,0	0,0	0,0	30,3	21,9	15,70	149,79
7	W	44,9	48,5	44,2	43	50	42,1	45,45	8,18
	e	0,3	0,3	0,3	0,3	0,3	0,3	0,30	0,00
	π	22,5	21,5	22,7	23,1	21,0	23,4	22,37	0,74
	u	22,9	26,5	22,2	21,0	28,0	20,1	23,45	8,18
8	W	43	58	44,5	43,4	42	78	51,48	170,27
	e	0,3	0,3	0,3	0,3	0	0,3	0,25	0,01
	π	23,1	18,6	22,7	23,0	0,0	12,6	16,66	69,18
	u	21,0	36,0	22,5	21,4	0,0	56,0	26,15	289,05
9	W	48,4	51,2	79	45	44,6	43,8	52,00	152,27
	e	0,3	0,3	0,3	0,3	0,3	0,3	0,30	0,00
	π	21,5	20,6	12,3	22,5	22,6	22,9	20,40	13,70
	u	26,4	29,2	57,0	23,0	22,6	21,8	30,00	152,27
10	W	40	50	44	44,6	46	42	44,43	9,87
	e	0,3	0,3	0,3	0,3	0,3	0,3	0,30	0,00
	π	24,0	21,0	22,8	22,6	22,2	23,4	22,67	0,89
	u	18,0	28,0	22,0	22,6	24,0	20,0	22,43	9,87
11	W	55,2	43	55,5	40	44,9	44	47,10	36,31
	e	0,5	0,3	0,3	0,3	0,3	0,3	0,33	0,01
	π	32,4	23,1	19,4	24,0	22,5	22,8	24,03	16,10
	u	29,2	21,0	33,5	18,0	22,9	22,0	24,43	27,73
12	W	50	49,5	38	62	80	34,3	52,30	233,83
	e	0,4	0,3	0	0,4	0,7	0	0,30	0,06
	π	28,0	21,2	0,0	23,2	28,0	0,0	16,73	145,87
	u	26,0	27,5	0,0	38,0	50,0	0,0	23,58	339,87
Average	W	45,13	48,18	46,39	43,45	48,27	45,66	46,18	
	e	0,32	0,23	0,20	0,23	0,31	0,28	0,26	
	π	23,28	15,50	14,01	17,28	20,90	20,16	18,52	
	u	20,67	21,85	18,64	17,36	23,93	22,63	20,85	
σ^2	W	29,41	43,65	116,26	43,34	100,38	102,30		75,43
	e	0,01	0,02	0,02	0,02	0,02	0,01		0,02
	π	63,46	81,57	106,16	99,61	42,90	45,10		83,48
	u	56,24	176,26	263,29	122,54	112,18	137,14		149,74

Table A5 Data RF treatment for pairs of subjects		Iteration						Average	σ^2
		1	2	3	4	5	6		
1	W	50,0	60,0	60,0	50,0	50,0	25,0	49,17	136,81
	e	0,4	0,6	0,5	0,3	0,2	0,1	0,35	0,03
	π	28,0	36,0	30,0	21,0	14,0	9,5	23,08	85,03
	u	26,0	32,0	34,0	28,0	29,0	5,0	25,67	92,22
2	W	29,8	38,0	22,0	25,0	25,0	26,0	27,63	26,74
	e	0,1	0,1	0,0	0,1	0,2	0,0	0,08	0,00
	π	9,0	8,2	0,0	9,5	19,0	0,0	7,62	41,91
	u	9,8	18,0	0,0	5,0	4,0	0,0	6,13	39,22
3	W	50,0	60,0	65,0	60,0	60,0	65,0	60,00	25,00
	e	0,4	0,6	0,6	0,6	0,5	0,1	0,47	0,03
	π	28,0	36,0	33,0	36,0	30,0	5,5	28,08	110,53
	u	26,0	32,0	37,0	32,0	34,0	45,0	34,33	33,56
4	W	50,0	55,0	60,0	55,0	70,0	20,0	51,67	238,89
	e	0,7	0,8	0,7	0,1	0,7	0,2	0,53	0,08
	π	49,0	52,0	42,0	6,5	35,0	20,0	34,08	261,03
	u	20,0	23,0	30,0	35,0	40,0	-1,0	24,50	175,58
5	W	44,9	47,6	50,2	52,0	48,0	45,0	47,95	6,60
	e	0,4	0,4	0,4	0,4	0,4	0,3	0,38	0,00
	π	30,0	29,0	27,9	27,2	28,8	22,5	27,57	5,92
	u	20,9	23,6	26,2	28,0	24,0	23,0	24,28	5,19
6	W	38,0	39,0	36,0	38,5	39,5	42,5	38,92	3,78
	e	0,5	0,3	0,0	0,2	0,3	0,3	0,27	0,02
	π	41,0	24,3	0,0	16,3	24,2	23,3	21,50	147,91
	u	12,0	17,0	0,0	17,5	17,5	20,5	14,08	45,95
7	W	35,0	25,0	30,0	34,5	35,5	27,0	31,17	16,89
	e	0,1	0,3	0,5	0,5	0,0	0,0	0,23	0,05
	π	8,5	28,5	45,0	42,8	0,0	0,0	20,79	357,22
	u	15,0	3,0	4,0	8,5	0,0	0,0	5,08	27,87
8	W	35,5	36,0	36,0	36,0	36,0	35,0	35,75	0,15
	e	0,6	0,7	0,2	0,3	0,0	0,1	0,32	0,06
	π	50,7	58,8	16,8	25,2	0,0	8,5	26,67	458,47
	u	7,5	6,0	15,0	14,0	0,0	15,0	9,58	31,20
9	W	40,0	35,0	50,0	54,3	56,3	60,0	49,27	79,99
	e	0,2	0,0	0,4	0,5	0,6	0,1	0,30	0,05
	π	16,0	0,0	28,0	32,9	38,2	6,0	20,18	195,48
	u	19,0	0,0	26,0	28,3	28,3	40,0	23,60	149,50
10	W	50,0	60,0	50,0	25,0	25,0	40,0	41,67	172,22
	e	0,5	0,4	0,2	0,1	0,5	0,2	0,32	0,02
	π	35,0	24,0	14,0	9,5	47,5	16,0	24,33	174,47
	u	24,0	36,0	29,0	5,0	-1,0	19,0	18,67	168,22
11	W	65,7	50,3	55,2	56,2	50,0	35,8	52,20	80,78
	e	0,4	0,2	0,3	0,2	0,1	0,1	0,22	0,01
	π	21,7	13,9	19,4	12,8	7,0	8,4	13,88	28,46
	u	41,7	29,3	33,2	35,2	30,0	15,8	30,87	61,97
12	W	51,0	61,5	70,5	72,5	77,5	81,5	69,08	103,87
	e	0,4	0,6	0,7	0,7	0,8	0,9	0,68	0,02
	π	27,6	35,1	34,7	33,3	34,0	34,7	33,21	6,64
	u	27,0	33,5	40,5	42,5	45,5	46,5	39,25	47,81
Average	W	44,99	47,28	48,74	46,58	47,73	41,90	46,21	
	e	0,39	0,42	0,38	0,33	0,36	0,20	0,35	
	π	28,72	28,82	24,23	22,73	23,14	12,86	23,42	
	u	20,74	21,12	22,91	23,25	20,94	19,07	21,34	
σ^2	W	88,32	140,46	202,44	197,55	250,40	313,99		203,87
	e	0,03	0,06	0,05	0,04	0,07	0,05		0,05
	π	174,70	258,30	195,90	131,11	215,97	101,54		207,90
	u	79,37	143,14	192,87	150,08	250,40	269,64		182,89

Table A6 Data RR treatment for pairs of subjects		Iteration						Average	σ^2
		1	2	3	4	5	6		
1	W	30,0	44,0	51,0	55,0	46,0	42,0	44,67	61,89
	e	0,0	0,3	0,4	0,4	0,3	0,3	0,28	0,02
	π	0,0	22,8	27,6	26,0	22,2	23,4	20,33	86,22
	u	0,0	22,0	27,0	31,0	24,0	20,0	20,67	97,89
2	W	40,0	30,0	35,0	38,0	42,0	41,0	37,67	16,89
	e	0,5	0,3	0,0	0,3	0,3	0,3	0,28	0,02
	π	40,0	27,0	0,0	24,6	23,4	23,7	23,12	139,52
	u	14,0	8,0	0,0	16,0	20,0	19,0	12,83	48,14
3	W	40,0	38,0	38,0	39,9	49,9	30,2	39,33	33,23
	e	0,3	0,3	0,0	0,3	0,3	0,0	0,20	0,02
	π	24,0	24,6	0,0	24,0	21,0	0,0	15,61	123,14
	u	18,0	16,0	0,0	17,9	27,9	0,0	13,30	102,91
4	W	50,0	51,0	50,0	49,0	51,0	44,0	49,17	5,81
	e	0,4	0,3	0,3	0,3	0,3	0,3	0,32	0,00
	π	28,0	20,7	21,0	21,3	20,7	22,8	22,42	6,74
	u	26,0	29,0	28,0	27,0	29,0	22,0	26,83	5,81
5	W	37,5	29,9	30,0	30,0	31,0	31,6	31,67	7,19
	e	0,3	0,4	0,3	0,3	0,3	0,3	0,32	0,00
	π	24,8	36,0	27,0	27,0	26,7	26,5	28,00	13,51
	u	15,5	5,9	8,0	8,0	9,0	9,6	9,33	8,93
6	W	38,5	30,0	33,0	30,0	31,5	32,5	32,58	8,28
	e	0,3	0,4	0,3	0,4	0,5	0,4	0,38	0,00
	π	24,5	36,0	26,1	36,0	44,3	35,0	33,63	44,48
	u	16,5	6,0	11,0	6,0	5,5	8,5	8,92	15,12
7	W	40,0	44,0	30,0	38,0	36,0	37,5	37,58	17,87
	e	0,3	0,3	0,0	0,3	0,3	0,3	0,25	0,01
	π	24,0	22,8	0,0	24,6	25,2	24,8	20,23	82,38
	u	18,0	22,0	0,0	16,0	14,0	15,5	14,25	46,98
8	W	51,0	44,6	37,0	44,6	35,9	44,6	42,95	26,35
	e	0,3	0,3	0,3	0,3	0,0	0,3	0,25	0,01
	π	20,7	22,6	24,9	22,6	0,0	22,6	18,91	72,99
	u	29,0	22,6	15,0	22,6	0,0	22,6	18,63	85,85
9	W	42,0	41,8	40,1	40,0	44,0	22,0	38,32	55,04
	e	0,3	0,3	0,3	0,3	0,3	0,0	0,25	0,01
	π	23,4	23,5	24,0	24,0	22,8	0,0	19,61	77,03
	u	20,0	19,8	18,1	18,0	22,0	0,0	16,32	55,04
10	W	30,0	35,0	40,0	42,0	40,0	22,0	34,83	48,81
	e	0,0	0,0	0,3	0,3	0,0	0,0	0,10	0,02
	π	0,0	0,0	24,0	23,4	0,0	0,0	7,90	124,85
	u	0,0	0,0	18,0	20,0	0,0	0,0	6,33	80,56
11	W	33,5	33,5	40,0	44,6	33,5	43,0	38,02	22,22
	e	0,3	0,0	0,3	0,3	0,0	0,3	0,20	0,02
	π	26,0	0,0	24,0	22,6	0,0	23,1	15,95	128,20
	u	11,5	0,0	18,0	22,6	0,0	21,0	12,18	86,23
12	W	36,5	35,0	40,0	44,6	36,5	40,0	38,77	10,26
	e	0,3	0,0	0,3	0,3	0,0	0,3	0,20	0,02
	π	25,1	0,0	24,0	22,6	0,0	24,0	15,95	127,62
	u	14,5	0,0	18,0	22,6	0,0	18,0	12,18	79,73
Average	W	39,08	38,07	38,68	41,31	39,78	35,87	38,80	
	e	0,28	0,24	0,23	0,32	0,22	0,23	0,25	
	π	21,69	19,67	18,55	24,90	17,19	18,82	20,14	
	u	15,25	12,61	13,43	18,98	12,62	13,02	14,32	
σ^2	W	39,83	44,23	40,58	46,75	42,91	60,27		48,51
	e	0,02	0,02	0,02	0,00	0,03	0,02		0,02
	π	114,75	151,43	117,29	13,45	182,59	128,25		124,33
	u	68,77	99,58	88,32	46,51	123,04	74,35		88,57

Appendix II

Real Effort, the Use of the Computers and Rewards

This appendix explains the differences between the experiments provided by Falk and Gächter (2002) and the institutional gift exchange game carried out in this thesis' experiments.

Falk and Gächter (2002) begin by determining the occurrence of reciprocity in a baseline treatment which involves ten one-shot games (called the OS treatment). They analyse the importance of reciprocity with a matching scheme which guarantees that a specific couple of participants interact only once.

In their second repeated game treatment (called the RG treatment) each pair of participants play ten repeated versions of the same game. Participants are informed they will play ten times with the same individual using a paper-based version of the experiment. Employer and employees have their own decision sheet and transmit their choices through the experimenter. They record and calculate the income they earn.

At the beginning of each period employers offer a wage between 20 and 120. The higher the level of wage they offer, the lower their income. Employees may accept the wage offer and decide the level of effort, or else reject it. If they accept the wage offer, the lowest level of work they can choose is 0.1 and the highest is 1.0. The higher the quantity of work an employee chooses, the higher his or her work-related cost is and, consequently, the higher the employer's income. The experimenter provides a feasible schedule of work and corresponding work-related costs to workers. Furthermore, employer and employees receive instructions about how to calculate their income in each period when employees accept the wage offer. If the worker does not accept the wage offer, both employer and employees earn nothing in this period.

In the institutional gift-exchange game, when making choices regarding salary or effort level, each player was able to use a computer which enabled them to calculate, in real time, the earnings which could be obtained by means of the various combinations of salary and effort level. Prior to making their salary offer, the employer could calculate the earnings obtainable by both parties based on every possible combination of salary and effort level. The software interface at their disposal requested the input of two values, which could be achieved with striking simplicity. The calculator then returned the earnings of both parties in real time. The worker was equipped with a more complicated interface since, in addition to enabling

the completion of these calculations, it also enabled the inputting of the words. The worker was informed by the computer of the salary offer they had been made. On the basis of this salary, the software allowed them to calculate, in real time, their possible earnings in relation to the various effort levels.

The use of computers achieved a notable increment in the intrinsic value of the experiment compared to the value achievable with paper-based experiments. Paper-based experiments, although far simpler to prepare and implement, do not allow players to fully consider all possible solutions. It should not be forgotten that in economic experiments the participants are asked to make decisions which, even though less complex than those normally faced in reality, nonetheless require brief periods of reflection, involvement and effort. In the real world economic agents make economic decisions with a level of involvement which varies in relation to the issues in question.

This computer-assisted experiment allowed the players to evaluate a great many combinations rapidly and effectively in little time, providing them with a very detailed picture of their options. In this way it was possible to minimise the problem of short-sightedness, which often results from the fact that the participants in the research tend to be of naturally limited rationality. The effects of tiredness and boredom were also prevented by greatly simplifying the numerous calculations which would otherwise have been impossible for participants who, it must be acknowledged, were of limited patience.

In Fehr, Falk and Gächter's experiments (Fehr *et al.*, 1993; Falk and Gächter, 2002) one may cast doubt on whether the participants actually carried out all the calculations necessary to achieve a good understanding of the game, and one may also suspect that the amount of effort participants put into calculating their own earnings was different to the effort put into calculating those of their counterparts. It is also possible that at a certain point the effects of boredom took over or that participants made mistakes in their calculations of the variables.

On the other side of the argument, a computer-assisted experiment could be criticised because it enables a qualitative level of rationality higher than the more limited level actually achievable in reality. However, various factors are in its favour since it becomes possible to control, using experimental methods, an external variable, namely the differing mathematical abilities of the volunteers used in the experiments and, more generally, their I.Q.. As such, these factors are rendered less critical. Therefore, one may consider the appealing possibility of being able to carry

out economic experiments using participants who are not necessarily students, thus improving the quality of the sample and also rendering the contribution of such participants more valuable.

Secondly, computer-based economic experiments can enable the simulation of economic situations of a complexity not feasible using paper-based methods, thus improving the range of research projects the researcher can conceive. In addition, in the experiments conducted by Falk and Gächter (2002), participants make only monetary choices; in the institutional gift exchange game, on the other hand, participants (the workers) are also invited to accomplish actual tasks consisting of work in fixed lists.

For a researcher, the ability to include real tasks radically changes the way in which an experiment is carried out. The first reason for this is the significant increase in the time taken to develop the experiment. Whilst developing the actual working methods to be used, the need to simulate the institutional culture faithfully must be considered as well as the need to avoid exceeding the time which the research volunteers can make themselves available for (i.e. normal study hours). The effects of tiredness must also be taken into account. The time factor was particularly relevant in these experiments because the two groups of volunteers (the workers' group and the employers' group) took turns using a single room equipped with computers. Since the two groups were kept separate to prevent them communicating, it was necessary to wait for every member of each group to complete the tasks of their choice before having them leave the computer room and sending in the other group. Therefore the time required to conclude each session depended on the slowest volunteer in the group. The workers' group obviously took more time, since they had not only to choose which effort level to work at but also to carry out the actual tasks. Therefore, only when the last of the workers, the "slowest", had completed the task could the workers' group be escorted from the computer room and the employers' group brought in.

As such, a researcher who wished to plan an experimental economic project with a series of real tasks comparable to this one would have to forecast the time required not according to the average time required for the tasks but according to the longest time required to complete the tasks amongst all the participants. It is also worth noting that the larger the number of participants, the slower the group as a whole is likely to become. In actual fact, during the course of the experiments it was notable that the higher the number of people involved, the higher was the average time

required to complete each session, and thus the longer the whole experiment lasted. For this reason the number of participants involved in any single experiment was never greater than 28.

Since “real-task” economic experiments necessitate the collaboration of a number of volunteers for considerable periods of time, it is important not to neglect this factor. For example, in the experiments I conducted the participants were students working during normal working hours, and these times obviously had to be respected. It is advisable before initiating a real research programme to run a few pilot programmes to fine tune the game, and make informed estimates of the times required to complete it. For my research two pilot experiments were conducted, the results of which are not included in this report, which enabled us to establish a clearer idea of the mechanisms and timescales of the game. As a result of these trials it was decided to limit the game to six iterations and to abandon the initial intention of carrying out ten iterations.

The introduction of real tasks therefore incurred a drastic reduction in the number of iterations which would otherwise have been possible. To conduct the experiment, including the phase in which the participants were instructed in the rules of the game, took about 4.5 hours on average. The manner in which the required undertaking was presented to the volunteers taking part was of significance. Moreover they offered active participation, and indeed some showed interest in the themes being researched.

An analysis of the data collected shows that there was no constant salary or effort level. The pairs continually varied their choices and there was no apparent convergence. It is possible that the absence of a clear average may have resulted from the limited number of iterations carried out for each experiment. As such the question arises whether an equilibrium would have been reached after a certain number of iterations. Obviously, the question could be resolved by a research project involving a larger number of iterations but the time limits imposed by technology do not permit this.

In more detail, each worker was equipped with three lists: a telephone directory extract consisting of 1655 subscribers from the city of Caltanissetta; a glossary of Japanese words comprising a total of 1000 words extracted from a Japanese-Italian dictionary; and a glossary of acronyms and abbreviations containing a total of 1027 entries extracted from the appendix of an encyclopaedia. These fixed lists were used to carry out the “real tasks”, which consisted of research activities. A sample page from each of these lists follows:

Telephone directory (sample page)

>> GATTO NICOLO' - VL. DELLE ROSE, 0	0934585696
>> GATTUSO GIUSEPPE - V. CASALINO, 46	093423314
>> GATTUSO MICHELE - LG. PAOLO BASILE, 170	093427763
>> GELFO CALOGERO - V. MARIO GATTO, 2	0934566905
>> GENCO SALVINA - V. F. TURATI, 41	0934591505
>> GENNARO CARMEN DANILA - V. LUIGI RIZZO, 23	0934597276
>> GENOVA LOMBARDO M. GEMMA - V. FILIPPO TURATI, 132	0934592697
>> GENOVESE D'ALEO CROCEFISSA - V. NAPOLEONE COLAJANNI, 104	093429559
>> GENTILE ANTONIO - V. FILIPPO PALADINI, 163	093420900
>> GENTILE ROSARIO - CONTR. BORGO PETILIA, 1	0934550126
>> GENZONE GIUSEPPE - V. DEI MILLE, 79	093425517
>> GERACI EMANUELE - V. NAPOLEONE COLAJANNI, 88	0934575377
>> GERACI MARIA - V. RUGGERO SETTIMO, 50	0934565116
>> GERACI VITTORIO - VL. TRIESTE, 157	0934598822
>> GERVASI GASPARE - V. FASCI SICILIANI, 17	0934555127
>> GIABBARRASI GIUSEPPE - V. SILLITTI, 17	093424422
>> GIACONE SALVATORE - V. LEONE XIII, 73	0934556780
>> GIALLOMBARDO GIUSEPPE - V. C. NAVA, 78	093426579
>> GIAMBARRESI FELICE - V. CONCETTO MARCHESI, 3	0934598902
>> GIAMBRA ALESSANDRO - V. F. TURATI, 0	0934595998
>> GIAMBRA GIUSEPPE - V. RE D'ITALIA, 12	0934582025
>> GIAMBRA PASQUALE - V. NISCEMI, 252	093424262
>> GIAMBRI MICHELE - V. CONSULTORE BENINTENDI, 47	093425867
>> GIAMMORCARO ALDO - V. LUIGI RUSSO, 1	0934595316
>> GIAMMORCARO MICHELE - V. ETTORE ROMAGNOLI, 6	0934592886
>> GIAMMUSSO CALOGERO - V. MARSALA, 1	093425180
>> GIAMMUSSO RANIERI - VL. ROCHESTER, 0	0934585574
>> GIAMPORCARO DARIO - VL. TRIESTE, 131	0934554519
>> GIANFORTE CALOGERA - V. FILIPPO PALADINI, 256	093423099
>> GIANGRECO EPIFANIO - V. LEONE XIII, 33	0934599143
>> GIANGRECO MICHELINA - V. CARDINALE DUSMET, 7	0934582952
>> GIANNA VOLA LUIGI - V. BRUNO BUOZZI, 6	0934593179
>> GIANNA VOLA SALVATORE - V. ARIMONDI, 40	093427396
>> GIANNONE ASSUNTA - V. ALCIDE DE GASPERI, 24	093423620
>> GIANNONE GIUSEPPE - V. SALVO D'ACQUISTO, 21	0934552425
>> GIANNONE MICHELE - V. P. EMILIANI GIUDICI, 12	0934584601

>> GIANNOTTA ANGELO - CONTR. TUCARBO, 0	0934598103
>> GIARDINA ANGELO - V. MAZZINI, 70	093421738
>> GIARDINA FILIPPO - V. VOLTURNO, 1	0934575110
>> GIARDINA LIBORIA - V. NISCEMI, 268	093422585
>> GIARDINA ROSA - V. ELENA, 92	0934583909
>> GIARRATANA ANGELO - V. ALDO MORO, 18	0934551606
>> GIARRATANA GABRIELE - V. DELLE CALCARE PALD, 0	0934551026
>> GIARRATANA LUIGI - CONTR. NISCIMA, 0	0934568557
>> GIARRATANA SALVATORE - C. UMBERTO, 64	0934575712
>> GIARRATANO GIUSEPPE - CONTR. MONTONE, 0	0934583486
>> GIARRUSSO CLAUDIO - V. GIOTTO, 0	0934582039
>> GIARRUSSO MICHELE - V. FRANCESCO SALAMONE, 6	093425321
>> GIBELLA ROSARIO - V. L. RIZZO, 3	0934594684
>> GIGANTI CALOGERO GIUSEPPE - V. ANGELO MUSCO, 34	0934584216
>> GIGLIO ALBERTO - V. COLONNELLO EBER, 19	093420487
>> GIGLIO GIOVANNI - V. GALATEA, 26	0934555356
>> GIGLIO LAURA - V. COLONNELLO EBER, 3	093423270
>> GIGLIO RALLO ANTONINA - V. VITTIME DEL IX LUGLIO, 50	0934552457
>> GILIBERTO MICHELE - VL. DELLA REGIONE, 216	0934554284
>> GINEVRA ANTONINO - V. TORTORICI, 51	093420383
>> GINEVRA GIUSEPPE - V. CAR. DUSMET, 37	093424221
>> GINEVRA MICHELE - C. ITALIA, 47	0934566951
>> GINEVRA SETTIMO - V. MALTA, 0	0934593682
>> GIOE' GIOVANNI - V. FILIPPO TURATI, 67	0934598049
>> GIOE' MICHELE - VL. STEFANO CANDURA, 0	093421849
>> GIOE' SALVATRICE - V. LUNETTA, 64	093423757
>> GIOIA MICHELE - V. SAN GIOVANNI BOSCO, 48	093426266
>> GIORDANO ALESSANDRO MARIA GIU - CONTR. CIALAGRA, 0	0934595001
>> GIORDANO CALOGERA - CONTR. FONTANA BIANCA, 0	0934560003
>> GIORDANO FRANCESCO - VL. TRIESTE, 221	0934596215
>> GIORDANO GIUSEPPE - CONTR. PRESTIANNI, 0	0934568675
>> GIORDANO LUCIA - V. POLA, 11	093421535
>> GIORDANO MICHELA - V. FRA' GIARRATANA, 12	093422751
>> GIORDANO MULONE GIOVANNA - V. ALDO MORO, 22	0934598515
>> GIORDANO SALVATORE - V. NAPOLEONE COLAJANNI, 9	093421276
>> GIORGINO GIUSEPPE - V. LEONE XIII, 97	0934553769
>> GIORGIO MARIA - VL. LUIGI MONACO, 48	0934550549
>> GIOVENCO GIUSEPPA - V. G. FALETRA, 19	0934593142

Glossary of Japanese words (sample page)

maneru	imitare
manga	fumetto
mania	mania
manto	mantello
mararia	malaria
marason	maratona
mare	raro
mari	palla
maru	circolo
marude	completamente
marui	rotondo
masi	aumento
massaazi	massaggio
massiro	bianchissimo
masu	diventare grande
masuku	maschera
masuto	albero
matataku	brillare
mati	città
matigai	errore
matigau	sbagliare
matti	fiammifero
matto	stuoia
matu	pino
mau	danzare
mazinai	incanto
mazui	sgradevole
mazusii	povero
mazyo	strega
me	occhio
meate	scopo
medetai	felice
megahon	megafono
megane	occhiali
meguri	giro
mei	nipote
meisi	biglietto da visita
meizin	esperto
mekata	peso
mekura	cieco
memo	nota
men	faccia
menbaa	membro
menzeki	area
merodii	melodia
merodorama	melodramma
meron	melone
messeezi	messaggio
mesu	femmina
metuboo	caduta
mi	corpo
miboozin	vedova
miburi	gesto
midori	verde
migaku	lucidare
migi	destra
migoto	bello
mihon	campione
mikake	apparenza
mikan	mandarino

mikata	amico
mikomi	previsione
mimai	visita
mimi	orecchio
minami	sud
minikui	brutto
minku	visione
minzoku	razza
mioboe	ricordo
mirai	futuro
miren	rimpianto
miru	vedere
misa	messa
misairu	missile
mise	negozio
misemono	mostra
misin	macchina
misu	errore
misuteru	abbandonare
mitasu	riempire
miti	strada
mibiku	condurre
mittu	tre
miya	tempio
miyage	regalo
mizu	acqua fred
mizuumi	lago
modan	moderno
moderu	modello
modosu	restituire
moeru	bruciare
mohoo	copia
mokuteki	scopo
mokuzi	indice
momen	cotone
momo	pesca
mon	cancello
mondai	problema
monku	testo
mono	oggetto
monoomoi	meditazione
monooto	suono
monoroogu	monologo
moodo	modo
moohu	coperta di
mookeru	guadagnare
mooretu	violento
moosu	dire
mootaa	motore
mooteru	motel
moppara	soprattutto
morau	ricevere
mori	foresta
moroi	fragile
moru	filtrare
moruhine	morfina
morumotto	cavia
motiiru	usare
moto	sotto
motomeru	cercare

List of initials, acronyms and abbreviations (sample page)

A.N.B.	Associazione Nazionale Bersaglieri	Ass. Com.	Associazione Comuni
A.N.C.	Alleanza Nazionale dei Cortadini	A.S.E.	Associazione Stampa
A.N.C.A.	Associazione Nazionale Cooperative Agricole	Ass.	Assicurazione
A.N.C.E.	Associazione Nazionale Costuttori Edili	ASSITALIA	Assicurazioni d'Italia
A.N.C.I.	Associazione Nazionale dei Comuni Italiani	ASSOBANCARIA	Associazione Bancari
A.N.C.R.	Associazione Nazionale Combattenti e Reduci	ASSOLOMBARDA	Associazione Industri
A.N.C.U.	Associazione Nazionale Clinici Universitari	A.S.S.T.	Azienda di Stato per i
A.N.D.E.	Associazione Nazionale Donne Elettrici	A.T.	Antico Testamento
A.N.D.S.	Associazione Nazionale Docenti Subalterni	AT	Asti
A.N.D.U.	Associazione Nazionale Docenti Universitari	A.T.A.	Agenzia Telegrafica
A.N.E.A.	Associazione Nazionale fra gli Enti di Assistenza	A.T.I.	Aero Trasporti Italiani
A.N.E.C.	Associazione Nazionale Esercenti Cinema	A.T.M.	Azienda Tramviaria N
A.N.E.I.	Associazione Nazionale Ex Internati	A.U.	Allievo Ufficiale
A.N.E.T.	Associazione Nazionale Esercenti Teatrali	A.U.C.	Allievo Ufficiale di C
A.N.F.I.	Associazione Nazionale Finanziari Italiani	A.U.R.T.	Associazione Utenti F Televisivi
A.N.I.A.	Associazione Nazionale Imprese Assicuratrici	AV	Avellino
A.N.I.C.A.	Associazione Nazionale Industrie Cinematografiche e Affini	A.V.I.S.	Associazione Volontari Sangue
A.N.I.E.	Associazione Nazionale Industrie Elettrotecniche ed Elettroniche	BA	Bari
A.N.I.L.S.	Associazione Nazionale Insegnanti Lingue Straniere	B.A.	Belle Arti
A.N.I.T.A.	Associazione Nazionale dell'Industria dei Trasporti Automobilistici	B.A.R.	Battaglione Addestrat
A.N.M.	Associazione Nazionale dei Magistrati	barr.	barriera
A.N.M.I.	Associazione Nazionale Marinai d'Italia	B.B.C.	British Broadcasting C
A.N.P.D.I.	Associazione Nazionale Paracadutisti d'Italia	b.c.	basso continuo
A.N.P.I.	Associazione Nazionale Partigiani d'Italia	B.C.I.	Banca Commerciale It
A.N.P.O.	Associazione Nazionale Primari Ospedalieri	B.E.I.	Banca Europea per gli
A.N.S.A.	Agenzia Nazionale Stampa Associata	B.F.	Bassa Frequenza
A.N.U.A.	Associazione Nazionale Ufficiali dell'Aeronautica	BG	Bergamo
A.N.V.G.	Associazione Nazionale Volontari di Guerra	BI	Banca d'Italia
AO	Aosta	B.I.C.E.	Banca Internazionale Cooperazione Econom
A.O.	Avanguardia Operaia	B.I.G.E.	Biglietto Individuale C
AP	Ascoli Piceno	BIMU	Biennale della Macch
a.p.c.	a pronta cassa	B.I.N.	Banca di Interesse Na
A.P.I.	Anonima Petroli Italiana	B.I.R.S.	Banca Internazionale Ricostituzione e lo Sv
app.	appendice	BL	Belluno
A.P.S.A.	Amministrazione del Patrimonio della Sede Apostolica	B.L.P.	Busta Lettere Postali
AQ	Aquila	BM	Banca Mondiale
A.R.A.	Autorespiratori ad Aria	B.M.T.	Bollettino Meteo Tele
arc	Arco	BN	Benevento
A.R.C.E.	Associazione per le Relazioni Culturali con l'Estero	BN.L.	Banca Nazionale del I
A.R.C.I.	Associazione Ricreativa Culturale Italiana	BO	Bologna
arcip.	arcipelago	BOT	Buono Ordinario del
arg	argomento	BR	Briandisi
A.R.I.	Associazione Radiotecnici Italiani	B.R.I.	Banca dei Regolamen
ARMIR	Armata Italiana in Russia	BS	Brescia
A.R.O.	Autorespiratore a Ossigeno	B.T.	Bassa Tensione
A.R.S.I.	Associazione per la Ricerca Scientifica Italiana	btg	battaglione
art.	articolo	B.T.N.	Buono del Tesoro No
A.S.	Allievo Sottoufficiale	B.T.O.	Buono del Tesoro Or
A.S.C.A.	Agenzia Stampa Cattolica Associata	B.T.P.	Buono del Tesoro Pol
A.S.C.I.	Associazione Scoutistica Cattolica Italiana	B.T.Q.	Buono del Tesoro Qu
		B.U.	Bollettino Ufficiale
		B.V.	Beata Vergine
		B.V.M.	Beata Vergine Maria
		BZ	Bolzano
		CA	Cagliari
		c.a.	corrente anno
		cad.	cadavere
		C.A.F.	Commissione d'Appe
		C.A.I.	Club Alpino Italiano
		C.A.N.	Commissione Arbitri
		Can.	canale
		C.A.P.	Codice di Avviament
		cap.	capitolo
		C.A.R.	Centro Addestrament
		C.A.S.	Comitato di Assistenz
		Casc.	Cascata
		C.A.S.M.	Centro Alti Studi Mili
		C.C.	Comitato Centrale
		Cast.	Castello
		C.C.G.	Consiglio di Coopera
		C.C.I.	Camera di Commerci

In the experiments conducted by Fehr and Gächter (2002), the worker has to choose an effort level, and this has a cost which grows proportionally. The reason for this is to replicate, in monetary terms, the psychological and physical exertion of human work, consistent with the fact that each hour of work is always tougher than the previous one.

In a research study constructed in this way the psychological element of work is lacking – the importance of which the experiment’s psychological elements aim to investigate. This idea is based upon the experimental results: there were indeed refusals of one-shot offers of work accompanied by low salaries, which would nevertheless have guaranteed workers positive, although modest, earnings. The purely economic prediction, based on considerations of perfect rationality, would in contrast have predicted definite acceptance. Therefore, the refusals cannot be explained by anything other than psychological motives. This leads one to wonder why current research paradigms do not consider the omission of psychological considerations to be sacrilegious, and furthermore that the introduction of “actual tasks” would allow a far more accurate reproduction of work situations.

In order to simulate the different method of working, the institutional gift exchange game provides the difference between flexible and rigid treatments. In the flexible and discretionary method of working, the worker can choose which research tasks to carry out. In other words, they can decide whether to search only for telephone numbers in the telephone directory, only for the Italian words which correspond to their Japanese equivalent, or only the meanings corresponding to the specific acronyms and abbreviations. Furthermore, the participant has the freedom to choose how much research to carry out in all three areas, thereby being able to create a combination which best suited them. In contrast, in the rigid and specific method of working, the computer randomly presented a list of ten tasks, mixing the various types and thus containing telephone lists, Japanese words and acronyms. The worker had to begin with the task indicated on the monitor and, if they wished to continue, had to follow the order imposed.

In the case of both the flexible and rigid treatments, the worker had the right to choose how much to work, a choice which was enacted on the basis of the calculations which the software allowed them to make. The factor which changed, in accordance with the rules of the game, was the quantity of work. The hypothesis of this research was that different institutional cultures can influence working relations, even for psychological reasons.

There follows some screenshots of the software used for the experiment. The first screenshots shown are those of the main menu screens. The most important features of the interface are shown in detailed screenshots along with a discussion of the specific details.



Software configuration

Gioco del lavoro

Impostazioni:

Postazione
4

Three stage game

Function-centred rules

Task-centred rules

One shot

Numero di iterazioni
6

Elenco dummy

Protezione dalla chiusura del programma

Possibilità di turni con impegno imposto

Ok



Above is the start up screen which is used exclusively by the experimenter to set certain game parameters. It enables selection of the gaming mode (flexible work culture) or task (rigid culture) and whether the experiment will be one-shot or repeated. Thus the various combinations available are: one-shot function (one-shot negotiation / flexible), one-shot task (one-shot negotiation / rigid), repeated function (repeated negotiation / flexible) and repeated task (repeated negotiation / rigid).

The number of iterations (in other words the number of times the employer and the worker will meet each other via the computer in which the programme is installed) can be selected via this screen. In the experiments conducted, the number of iterations was always set to six.

Choosing the option “Protezione dalla chiusura del programma” (“Protection from application shutdown”) activates a function which prevents the participants in the experiment from inadvertently closing down the application during play. An attempt to shut down the programme brings up a dialogue box prompting the user to insert a password to complete the operation, a password known only to the experimenters (the password is 1234).

The “Elenco dummy” (“Dummy directory”) option allows substitution of the telephone directory with a fictitious directory in which, rather than listing the subscriber name (e.g. Mario Rossi) and telephone number (e.g. 555123) there is, instead, a column in which a number is written in words (e.g. four, five hundred, one thousand five hundred and seventy) and beside it the same number in digits (e.g. 4, 15, 1570). This dummy list was only used in the debugging and testing phase in order to save time in the completion of sample tasks.

Other options appear titled “Three stage game” and “Possibilità di turni con impegno imposto” (“Option of turn with pre-selected tasks”), but these relate to functions of the software which are not yet developed and which were not used in the experiments described in this research.

Employer's interface in the function game

Gioco del lavoro - One Shot Game - Function Centred Rules - Postazione 4

Turno 1/6

ISTRUZIONI
 Ti è stato assegnato un lavoratore al quale poter offrire un contratto di lavoro. Il contratto prevede che il lavoratore esegua per te 10 compiti, consistenti nell'effettuazione di ricerche da elenchi di cui il tuo lavoratore è provvisto. Queste ricerche sono di 3 categorie: trovare numeri di abbonati telefonici, il significato di parole giapponesi e il significato di sigle o abbreviazioni.
 Nell'esecuzione di tali compiti il lavoratore avrà discrezionalità di scegliere quali eseguire da un numero insieme che gli verrà proposto dal computer. Avrà anche discrezionalità di scegliere in quale ordine eseguirli.
 Devi decidere quale salario offrire. Deve essere compreso tra 20 e 120 Monete. 20 Monete è il salario minimo a partire dal quale il lavoratore ha la possibilità di ottenere un guadagno accettando la tua offerta.
 Tieni presente che:
 - Il lavoratore potrà comunque decidere se accettare o non accettare la tua offerta.
 - Se rifiuterà, guadagnerete entrambi 0 Monete per questo turno
 - Se accetterà, il lavoratore potrà lavorare con un livello di impegno variabile, in quanto non avrai modo di vigilare sul suo operato. Accettando sarà però obbligato ad eseguire almeno 1 compito (livello di impegno del 10%).
 - A maggiori livelli di impegno da lui sostenuti corrispondono per te maggiori guadagni.
 - Lavorare rappresenta per lui un costo che cresce con il livello di impegno. Tale costo è spiegato nella tabella sotto.
 - Oltre al costo dell'impegno dovrà sopportare anche un costo fisso di 20 Monete, pari alla spesa necessaria per recarsi al posto di lavoro.
 - Le formule del tuo guadagno e di quello del tuo lavoratore sono illustrate sotto.
 - Una volta effettuata questa offerta non avrai mai più modo di effettuarne un'altra con questo stesso lavoratore.

Livello impegno	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Costo impegno	0	1	2	4	6	8	10	12	15	18

La formula del tuo guadagno è:
 $(120 - \text{Salario}) \times \text{Impegno del \% lavoratore}$

La formula del guadagno del tuo lavoratore è:
 $\text{Salario} - 20 - \text{Costo dell'impegno}$

Fai la tua offerta di salario per questo turno. Deve essere compresa tra 20 e 120:

◀◀ ◀ 54.0 ▶ ▶▶

Offrendo questo salario, se il tuo lavoratore dovesse accettare con un livello di impegno:

◀ 40% ▶

cioè eseguendo per te 4 compiti, il tuo guadagno sarebbe di 26.4 Monete, mentre il guadagno del tuo lavoratore sarebbe di 30.0 Monete.

Ok

The employer's interface shows, at the top details of the current turn and, underneath, the game instructions (the instructions shown in this example are for the one-shot game) and the formulae for the profit in relation to the worker and the employer with the table of the cost of the effort level. Below this the salary can be selected and the profits relating to the various salary-effort combinations can be calculated.

The "OK" button activates the salary offer selected.



Employer's interface in the task game

Gioco del lavoro - One Shot Game - Task Centred Rules - Postazione 4

Turno 1/6

ISTRUZIONI

Ti è stato assegnato un lavoratore al quale poter offrire un contratto di lavoro. Il contratto prevede che il lavoratore esegua per te 10 compiti, consistenti nell'effettuazione di ricerche da elenchi di cui il tuo lavoratore è provvisto. Queste ricerche sono di 3 categorie: trovare numeri di abbonati telefonici, il significato di parole giapponesi e il significato di sigle o abbreviazioni.

Nell'esecuzione di tali compiti il lavoratore non avrà discrezionalità di scegliere quali compiti eseguire. Il computer gli imporrà un dettaglio insieme di compiti che dovrà eseguire nell'ordine con il quale compaiono.

Devi decidere quale salario offrire. Deve essere compreso tra 22 e 120 Monete. 22 Monete è il salario minimo a partire dal quale il lavoratore ha la possibilità di ottenere un guadagno accettando la tua offerta.

Tieni presente che:

- Il lavoratore potrà comunque decidere se accettare o non accettare la tua offerta.
- Se rifiuterà, guadagnerete entrambi 0 Monete per questo turno
- Se accetterà, il lavoratore potrà lavorare con un livello di impegno variabile, in quanto non avrai modo di vigilare sul suo operato. Accettando sarà però obbligato ad eseguire almeno 3 compiti (livello di impegno del 30%).
- A maggiori livelli di impegno da lui sostenuti corrispondono per te maggiori guadagni.
- Lavorare rappresenta per lui un costo che cresce con il livello di impegno. Tale costo è spiegato nella tabella sotto.
- Oltre al costo dell'impegno dovrà sopportare anche un costo fisso di 20 Monete, pari alla spesa necessaria per recarsi al posto di lavoro.
- Le formule del tuo guadagno e di quello del tuo lavoratore sono illustrate sotto.
- Una volta effettuata questa offerta non avrai mai più modo di effettuarne un'altra con questo stesso lavoratore.

La formula del tuo guadagno è:

$$(120 - \text{Salario}) \times \text{Impegno del \% lavoratore}$$

La formula del guadagno del tuo lavoratore è:

$$\text{Salario} - 20 - \text{Costo dell'impegno}$$

Livello impegno	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Costo impegno	0	1	2	4	6	8	10	12	15	18

Fai la tua offerta di salario per questo turno. Deve essere compresa tra 22 e 120:

54.0



Offrendo questo salario, se il tuo lavoratore dovesse accettare con un livello di impegno:

80%

cioè eseguendo per te 8 compiti, il tuo guadagno sarebbe di 52.8 Monete, mentre il guadagno del tuo lavoratore sarebbe di 22.0 Monete.

Ok



The employer's interface in the task game is similar in every respect to the function game interface, although clearly the instructions are different. The fundamental differences are in the salary range, which spans from 22 to 120, and in the effort level, which can be made to vary between 30% and 100%.



Worker's interface in the function game

Gioco del lavoro - One Shot Game - Function Centred Rules - Postazione 4

Turno 1/3

Il datore di lavoro dal quale sei stato contattato per questo turno ti ha offerto un contratto di lavoro con un salario di 54.0 Monete. Il contratto prevede che tu esegua 10 compiti. Tuttavia, una volta accettato il contratto, il tuo datore di lavoro non avrà la possibilità di obbligarti ad eseguire tutti e 10 i compiti previsti. Per poter accettare il contratto, e quindi percepire il salario, è necessario eseguire almeno 1 compito. Nell'esecuzione del contratto potrai svolgere discrezionalmente i compiti che preferisci, cioè senza che ti vengano indicati quali esegui in quale ordine. Scegli quindi liberamente se cercare numeri di telefono, il significato delle parole giapponesi o quello delle sigle serviti 3 browser che compaiono sullo schermo.

Tieni presente che:

- Se non accetti, per questo turno il tuo guadagno e quello del tuo datore di lavoro sarà di 0 Monete.
- Per poter accettare l'offerta e percepire il salario devi eseguire almeno un compito.
- Lavorare rappresenta per te un costo che cresce con il livello di impegno. Tale costo è spiegato nella tabella sotto.
- Tale impegno dipende dalla quantità di compiti eseguiti. Più precisamente esso cresce di un 10% per ogni compito eseguito.
- Accettando l'offerta di lavoro dovrai sopportare un costo di 20 Monete per spostarti da casa tua al posto di lavoro.
- A maggiori livelli di impegno corrispondono maggiori guadagni per il tuo datore di lavoro.
- Le formule del tuo guadagno e di quello del tuo datore di lavoro sono illustrate sotto.
- Nei prossimi turni non sarai più contattato da questo stesso datore di lavoro.

La formula del guadagno del tuo datore di lavoro è:	La formula del tuo guadagno è:	Livello impegno	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
$(120 - \text{Salario}) \times \text{Impegno del lavoratore} \%$	$\text{Salario} - 20 - \text{Costo dell'impegno}$	Costo impegno	0	1	2	4	6	8	10	12	15	18

Il tuo livello di impegno fino a questo momento:

Compiti eseguiti: 2

Salario offerto: 54.0 Monete

ATTENZIONE:
Il contratto ti impone un impegno minimo del 10%. Per poter accettare l'offerta e percepire il salario devi eseguire almeno 1 compito.

Se smetti di lavorare adesso, il tuo guadagno sarà di:

Salario	54.0 -
Costo del viaggio	20.0 -
Costo dell'impegno	1.0 =
Guadagno	33.0

Il guadagno potenziale del tuo datore di lavoro sarebbe: 33.0

Il guadagno del tuo datore di lavoro sarebbe: 13.2

Rifiuta offerta Fine lavoro

Abbonati telefonici

ABATE ANGELO - VL. STEFANO CANDURA, 50
 ABATE MICHELA - V. PADRE ANGELICO LIPANI, 6
 ABBATE ALFONSO - V. KENNEDY, 30
 ABBATE MARIO - V. ALCIDE DE GASPERI, 17
 ABBATE SALVATORE FRANCESCO - V. CARLO PISACANE, 12
 ACCIDENTI FRANCESCA - V. CARLO PISACANE, 77
 ACQUAVIVA VINCENZO - V. ROSMINI, 3

Nome: ABBATE ALFONSO - V. KENNEDY, 30 Telefono: 0934 Ok

Parole giapponesi

aite
 aizu
 aka
 akai
 akanboo
 akari
 akarui

Giapponese: Italiano: Ok

Sigle

A1
 A2
 A3
 A4
 A5
 A6
 A7

Sigla: Significato: Ok

Frans

The interface available to the worker is noticeably more complex than the employer's. At the top, the number of the current iteration is indicated. Below this are the instructions, accompanied by earnings formulae and the table of the costs of the effort levels.

The central section contains the tools for calculating the payoffs and to carry out the acceptance or refusal of the offers. It also contains an indication of the level of effort actually made.

The lower part is used to carry out the actual tasks. In the function version the worker can organise their work at their own discretion, in the sense that they can choose which tasks to carry out amongst those listed in the three separate scroll boxes. Thus there are three separate lists of tasks and three separate text boxes to insert the results. Once the search result relating to the name, Japanese word or acronym has been typed in this can then be confirmed by clicking on the "OK" button to the right. The computer checks that the text inserted is correct and, if so, assigns an additional 10% of effort.



Worker's interface in the task game

Gioco del lavoro - One Shot Game - Task Centred Rules - Postazione 4

Turno 1/6

Il datore di lavoro dal quale sei stato contattato per questo turno ti ha offerto un contratto di lavoro con un salario di 54.0 Monete. Il contratto prevede che tu esegua 10 compiti. Tuttavia, una volta accettato il contratto, il tuo datore di lavoro non avrà la possibilità di obbligarti ad eseguire tutti e 10 i compiti previsti.

Nell'esecuzione del contratto dovrai svolgere i compiti che ti sono stati esplicitamente richiesti e nell'ordine con il quale compaiono sullo schermo. Nelle caselle di testo in basso trovi indicati i compiti, che possono consistere, di volta in volta, in cercare numeri di telefono, cercare il significato di parole giapponesi o cercare il significato di sigle e abbreviazioni.

Tieni presente che:

- Se non accetti, per questo turno il tuo guadagno e quello del tuo datore di lavoro sarà di 0 Monete.
- Per poter accettare l'offerta e percepire il salario devi eseguire almeno i primi 3 compiti, cioè devi dare almeno un impegno del 30%.
- Lavorare rappresenta per te un costo che cresce con il livello di impegno. Tale costo è spiegato nella tabella sotto.
- Tale impegno dipende dalla quantità di compiti eseguiti. Più precisamente esso cresce di un 10% per ogni compito eseguito.
- Accettando l'offerta di lavoro dovrai sopportare un costo di 20 Monete per spostarti da casa tua al posto di lavoro.
- A maggiori livelli di impegno corrispondono maggiori guadagni per il tuo datore di lavoro.
- Le formule del tuo guadagno e di quello del tuo datore di lavoro sono illustrate sotto.
- Nei prossimi turni non sarai più contattato da questo stesso datore di lavoro.

La formula del guadagno del tuo datore di lavoro è:	La formula del tuo guadagno è:	Livello impegno	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
$(120 - \text{Salario}) \times \text{Impegno del \% lavoratore}$	$\text{Salario} - 20 - \text{Costo dell'impegno}$	Costo impegno	0	1	2	4	6	8	10	12	15	18

Il tuo livello di impegno fino a questo momento:

Compiti eseguiti: 4

Salario offerto: 54.0 Monete

ATTENZIONE:
Il contratto ti impone un impegno minimo del 30%.
Per poter accettare l'offerta e percepire il salario devi eseguire almeno i primi 3 compiti.

Rifiuta offerta Fine lavoro

Se smetti di lavorare adesso, il tuo guadagno sarà di:

Salario	54.0	-
Costo del viaggio	20.0	-
Costo dell'impegno	4.0	=
Guadagno	30.0	

Il guadagno del tuo datore di lavoro sarebbe: 26.4

Il tuo guadagno sarebbe:

Salario	54.0	-
Costo del viaggio	20.0	-
Costo dell'impegno	8.0	=
Guadagno potenziale	26.0	

Il guadagno potenziale del tuo datore di lavoro sarebbe: 39.6

Giapponese Italiano

taisoo ginnastica Ok

Sigla Significato

L.I.D. lega italiana per il divorzio Ok

Nome Telefono

PILATO CARMELO - V. BORREMANS, 64 0934554105 Ok

Sigla Significato

A.C.C.S. associazione commercio cereali e semi Ok

Giapponese Italiano

ane Ok

Giapponese Italiano

baaten Ok

Giapponese Italiano

yasumi Ok

Nome Telefono

CORTESE ROSA - V. DUE FONTANE, 21 Ok

Nome Telefono

LA PUGLIA SEBASTIANO - V. ETTORE ROMAGNOLI, 27 Ok

Nome Telefono

RUSSELLO CARMELO - V. DEI MILLE, 12 Ok




The worker's interface for the task game has two main differences from that for the function game. The effort level can be altered from 30% to 100% so that, in order to accept the offer of work the worker must perform at least three tasks, whilst in the function version a single task is sufficient. The second difference concerns the way in which the worker has to work. Here the tasks are pre-set and have to be carried out in a fixed order. The computer produces a random selection at each iteration, mixing tasks which involve searching for telephone numbers in the directory, looking up the meaning of Japanese words and finding the meanings of initials.

Salary offer [detail]

Fai la tua offerta di salario per questo turno. Deve essere compresa tra 20 e 120:

← **1**

 Offrendo questo salario, se il tuo lavoratore dovesse accettare con un livello di impegno:

← **2**

cioè eseguendo per te 4 compiti, il guadagno sarebbe di 26.4 Monete, mentre il guadagno del tuo lavoratore sarebbe di 30.0 Monete.

← **3**



Here the employer can calculate and choose the salary they intend to offer. For each combination of salary and effort level the computer calculates in real time the employer's and the worker's profits, thus giving valuable assistance in the decision-making process.

1

This slider enables the employer to choose the salary to give his employee. This salary varies between 20 and 120 in the function game and 22 and 120 in the task game. The interface does not allow values outside these ranges. Salaries can be varied by decimal fractions, which work on a sliding scale internally but in the GUI are varied in unit increments.

2

In this section of the interface, enclosed in an area indicated with a calculator icon, the employer can calculate his profits and his worker's profits as a function of the effort level and the salary. Obviously the employer has to make hypotheses and these help him make his choices. Essentially the employer has to vary the salary (item 1 in the interface) and the effort level (within item 2 in the interface). By varying these two values the computer communicates in real time the earnings of both parties. The effort level can vary from 10% to 100% in the function version and from 30% to 100% in the task version.

3

The "OK" button allows the choice to be activated. After clicking OK a dialogue box appears in which the employer is asked to confirm his choice and asked to call the experimenter to inform him that the choice has been made and to enable him to make a note of the choice. In any case the computer saves the employer and the employee's choices to a text file.

Payoff calculation in the worker's interface [detail]

Dato il salario offerto di 54.0 Monete, con un livello di impegno pari a:

50%

Il tuo guadagno sarebbe:

Salario	54.0	-
Costo del viaggio	20.0	-
Costo dell'impegno	6.0	=
Guadagno potenziale	28.0	

Il guadagno potenziale del tuo datore di lavoro sarebbe:

33.0

Il tuo livello di impegno: 0% 10% 20% 30%

Compiti eseguiti: 2

Salario offerto: 54.0

ATTENZIONE:
Il contratto ti impone un impegno di almeno 1 compito.

Rifiuta

This section of the interface, enclosed in a box indicated by a calculator icon, allows the worker to calculate his earnings and his employer's earnings as a function of each possible effort level. By sliding the effort level the worker can see what earnings they and their counterpart would attain.

The worker can slide the effort level within the permitted range in order to calculate his, and his employer's, potential earnings. In the function game this can be varied from 10% to 100%, whilst in the task version it can vary from 30% to 100%. The computer calculates each party's earnings automatically.

The worker's potential earnings as a function of the salary received and the effort level muted are displayed. The value is shown as a function of the worker's payoff formula, thus also indicating the effort cost in the variant of the effort level chosen.

The employer's profit, given the salary received and the effort level offered is shown.



Effort level and acceptance or refusal [detail]



In this section of the interface the worker can monitor the effort level inserted up to that point, see the salary they have been offered and proceed to refuse or accept the offer. A warning box explains that the contract imposes a minimum effort level of 10% in order to accept. In the task game they are advised that this level is 30%.

1

The effort level bar indicates the effort level actually inserted up until this point. As the number of tasks carried out grows, the bar increases.

2

Displays the number of tasks carried out.

3

Displays the salary offered by the employer.

4

By clicking on this button the worker can refuse the offer received. The button is disabled when the minimum effort level requested to be able to accept the offer is entered (10% in the function game and 30% in the task game).

5

By clicking on this button the worker accepts the salary offer with the effort level entered at that moment. Initially, the button is disabled and is not activated until the minimum effort level required to accept the job is reached (10% in the function game and 30% in the task game).


► **Actual earnings seen by the worker [detail]**

Se smetti di lavorare adesso, il tuo guadagno sarà di:

Salario	54.0	-
Costo del viaggio	20.0	-
Costo dell'impegno	1.0	=
<hr/>		
Guadagno	33.0	← 1

Il guadagno del tuo datore di lavoro sarebbe:

13.2 ← 2

	<p>This part of the interface shows the worker their earnings and their employer's earnings relative to the salary they have received, as well as the effort level keyed in up to that point.</p>
<p>1</p>	<p>The worker's effective earnings, that is, what they could obtain by accepting the salary offer with the effort level entered up to that point and clicking on the "End work" button. The earnings obtainable thus far are calculated using the earnings algorithm.</p>
<p>2</p>	<p>The employer's earnings, that is, what they could obtain if the worker decided to accept the salary offer with the effort level entered up to that point.</p>

Insertion of work - function [detail]

Abbonati telefonici

ABATE ANGELO - VL. STEFANO CANDURA, 50
ABATE MICHELA - V. PADRE ANGELICO LIPANI, 6
ABBATE ALFONSO - V. KENNEDY, 30 ← 1
ABBATE MARIO - V. ALCIDE DE GASPERI, 17
ABBATE SALVATORE FRANCESCO - V. CARLO PISACANE, 12
ACCIDENTI FRANCESCA - V. CARLO PISACANE, 77
ACQUAVIVA VINCENZO - V. ROSMINI, 3

Nome Telefono

ABBATE ALFONSO - V. KENNEDY, 30 ← 2 0934 ← 3

Parole giapponesi

aite
aizu
aka
akai ← 1
akanboo
akari
akarui

Giapponese Italiano

← 2 ← 3

Sigle

A1
A2
A3
A4 ← 1
A5
A6
A7

Sigla Significato

← 2 ← 3

In the function game the worker can decide which tasks to carry out. There are three lists made available from which they can choose research tasks to carry out: telephone directory, glossary of Japanese words, acronyms. The worker can choose whether to carry out research from just one list, or from more than one list and without a predetermined order.

Telephone directory / Japanese words / acronyms. From these lists the user can choose which research task to perform by simply clicking on a word. Following the click the task will appear in field 2 and it will then be possible to insert the result in field 3. The searches already carried out cannot be repeated and are greyed out (see for example the word “aka” in the glossary of Japanese words).

In the text boxes the worker keys in the results of the searches.

Clicking on the “OK” button shows whether the result entered is correct. If the response is correct the effort level is increased; if not, the computer will give an error message. Once the maximum effort level is reached it is not possible to insert further words.



Insertion of work – task [detail]

Giapponese daitai	← 1	Italiano in generale	← 2	3 →	Ok
Giapponese isiki		Italiano conoscenza			Ok
Sigla O.M.S.		Significato			Ok
Nome VALENZA SALVATORE - V. DUE FONTANE, 0		Telefono			Ok
Giapponese remon		Italiano			Ok
Sigla ns.		Significato			Ok
Nome GIALLOMBARDO GIUSEPPE - V. C. NAVA, 78		Telefono			Ok
Nome AMORE CRISTOFORO - V. FILIPPO TURATI, 172		Telefono			Ok
Nome COLLI ANTONINA - V. LAZIO, 19		Telefono			Ok
Giapponese hanareru		Italiano			Ok



When entering the effort in the task game, the computer selects at random a list of ten tasks and they have to be carried out in the order in which they are given. The difference between this and the function game is that here the worker has a specific list of tasks and whilst they can choose which ones to carry out, they cannot choose how many.

1

The task which is specifically indicated by the computer, chosen randomly from the three lists in its memory. The tasks must be carried out incrementally in the order indicated on the screen (working from top to bottom).

2

The field, in which the worker must insert the correct answer (telephone number, Italian meaning of the Japanese word, meaning of the acronym).

3

The “OK” button confirms the answer inserted. The computer checks the answer and assigns a 10% increment to the effort level only if the answer is correct.

The software developed for the experiment was written in C++ by Giovanni Lo Magno (my research assistant) under my instruction. The development environment used was Dev C++. For the graphic interface the FLTK libraries were used (www.fltk.org). It should be emphasised that all the instruments used to create the software are free, and can freely be downloaded from the Internet. Thus no copyright was violated and the financial cost of the software was nil.

Since the FLTK libraries were used, the software developed falls, for the purpose of licensing, into the category of *open source* software. As a result it can freely be distributed, but if requested a copy of the sources must also be provided to permit modification. This restriction should not be considered limiting since any improvements in the software affected by other programmers may only be considered positive contributions and nobody may assert ownership in the case of further distribution.

It was not feasible to obtain the participants' involvement without offering them some form of reward for taking part in the game. To achieve this, prizes of modest yet sufficient value were offered in order to attract interest and inspire them to behave as if they were in a genuine economic situation. The virtual money of the game (henceforth called "Money") was thus converted into real rewards. The prizes consisted of stamps for collecting points with a well known vendor of petrol and blank CDs. It was borne in mind that the prizes had to be as divisible into small enough units to correspond to hypothetical increments in profit.

Participants were welcomed with a brief description of the research, followed by an explanation of the way the game worked and the rules of play. This phase lasted about an hour on average. An explanation of microeconomic details was opportunely avoided as this could have influenced the behaviour of the players and thus affected the outcome of the experiment. Emphasis was placed on getting participants interested and involved in the experience, which was presented to them as an educational activity, encouraging them to take part in the game and underlining the fact that prizes were available. The experimenters assumed cordial and fairly informal attitudes, encouraging questions and checking that the rules had been correctly understood. It was made clear that understanding the game was a prerequisite for starting the real phase of the experiment.

In the experiments undertaken by Falk and Gächter (2002), each of the

participants was also randomly assigned to one of the several groups. The random division of the participants into employers and workers was then also made in the institutional gift exchange game. In cases where an uneven number of people were involved, couples were formed in which the employer was one of the experimenters, a pair which naturally was not taken into account in the research data.

The two groups were kept separate (like the two partners in the prisoner game) to avoid possible collaboration. Upon first entering the computer room the group was instructed on how to use the software. The first iterations were always the longest ones because this was the first encounter with the software and the first time playing the actual game for real. The software always worked correctly. It wrote the data relating to the selections made to the hard disk, thus providing a technical backup.

The experimenter checked that participants were using the software correctly. In performing this task the experimenter always maintained the detachment necessary to avoid influencing individual choices. At the end of the experimental session economic explanations of the experience were made, to complete the educational activity of which the experiment formed a part. At the end of the experiments, discussions were also held with the participants to help them better understand the motivation behind their behaviour during the course of the game. This allowed a better understanding of the participants' rationale and provided much food for thought. In these discussions certain terms emerged, such as "reciprocity", "trust" and "indicators", reassuring me that my idea of the behavioural model which I had theoretically incorporated into the game was correct.

Appendix III

Isoeffort Line, Isowage Line and the Maximum Workplace Welfare Achievable with Equal Payoff

Isoeffort lines describe the combination of all the players' possible gains where the effort levels \bar{e} are the same. The equation of the isoeffort line may be obtained by replacing the general level e of the payoff functions with a constant level of effort \bar{e} . In general, the payoff functions with a constant level of effort may be defined in the following way:

$$\pi = (120 - w)\bar{e} = 120\bar{e} - w\bar{e} \quad [1]$$

$$w = u + 20 + c(\bar{e}) \quad [2]$$

If we combine equation [2] with equation [1] we obtain:

$$\pi = -\bar{e}u + 100\bar{e} - c(\bar{e})\bar{e} \quad [3]$$

Equation 3 is a downward sloping line, where $-\bar{e}$ is the gradient coefficient and $100\bar{e} - c(\bar{e})\bar{e}$ is the vertical intercept. As stated above, this is called the isoeffort line and identifies all the payoffs which may be associated with a constant level of effort.

The employer's gain is negatively correlated with the wage: given \bar{e} , its minimum gain coincides with its maximum wage, and its maximum gain coincides with its minimum wage. Thus:

$$\pi_{\min}(\bar{e}) = (120 - w_{\max})\bar{e} = (120 - 120)\bar{e} = 0$$

$$\pi_{\max}(\bar{e}) = (120 - w_{\min})\bar{e} = (120 - 20)\bar{e} = 100\bar{e}$$

While π_{\min} is always 0 for each level of \bar{e} , π_{\max} is always greater than zero and it is positively correlated with \bar{e} . The employee's gain is positively correlated with his wage: given \bar{e} , its minimum gain coincides with its minimum wage, and its maximum gain coincides with its maximum wage. Thus:

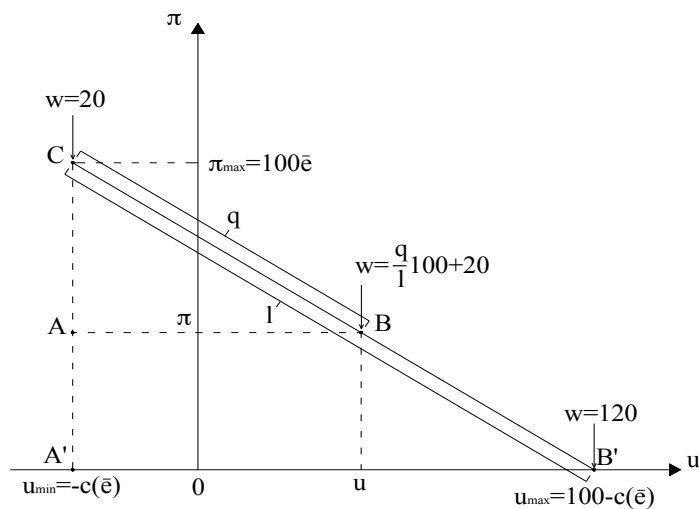
$$u_{\min}(\bar{e}) = w_{\min} - 20 - c(\bar{e}) = 20 - 20 - c(\bar{e}) = -c(\bar{e})$$

$$u_{\max}(\bar{e}) = w_{\max} - 20 - c(\bar{e}) = 120 - 20 - c(\bar{e}) = 100 - c(\bar{e})$$

While u_{\min} is always negative and negatively correlated with the effort level (\bar{e}), u_{\max} , on the other hand, is always positive but also positively correlated with the effort level \bar{e} . Since the worker's minimum gain coincides with the employer's maximum gain and *vice versa*, the following coordinates identify the limits (extremes) of the isoeffort lines: $(u_{\min}(\bar{e}); \pi_{\max}(\bar{e}))$ e $(u_{\max}(\bar{e}); \pi_{\min}(\bar{e}))$.

The isowage curves describe the combination of all the players' gains among which the wage levels (\bar{w}) are the same. One can demonstrate the presence of a geometric property, which can help derive the set of isowage curves. One can see that the extreme left of the segment corresponds to the payoff couple for which, given the effort level \bar{e} , the worker's profit is the minimum and that of the employer is the maximum, and the salary corresponding to that minimum is $w = 20$. At the extreme right, the opposite values hold: one maximises profit for the worker and minimises that of the employer, and for the payoff pair the maximum salary is $w = 120$.

Figure A.1 Isoeffort lines and salary levels



Moving to the segment on the extreme left and the extreme right, we find payoff couples which have far higher associated salary levels. At the halfway point of the segment, we find the salary which corresponds to $\frac{1}{2}$ of the range within which the salary can vary, at three quarters of the segment we find the salary which corresponds to $\frac{3}{4}$ of the range and so on. If l is the length of the isoeffort segment and q is the part of the segment which goes from the extreme left to the point corresponding to a given pair $(u; \pi)$, one can demonstrate that

$$w = \frac{q}{l} \cdot range + w_{\min} = \frac{q}{l} 100 + 20.$$

This formula comes from the fact that the range in which the salary varies is

$$range = w_{\max} - w_{\min} = 120 - 20 = 100$$

and the departing value is $w_{\min} = 20$.

To demonstrate the formula, let us observe the graph and consider, on an isoeffort segment for $e = \bar{e}$, a generic pair $(u; \pi)$ with which the segment q is associated, corresponding to \overline{CB} . The entire isoeffort line is instead called l and corresponds to $\overline{CB'}$. To calculate the relationship between $\frac{q}{l}$ one can make use of the relationship between the triangles $\hat{A}BC$ and $\hat{A'B'C}$, as these are equivalent.

Thus the proportion is

$$\overline{CB} : \overline{CB'} = \overline{AB} : \overline{A'B'}.$$

We can calculate the relationship $\frac{q}{l}$ by calculating the relationship $\frac{\overline{AB}}{\overline{A'B'}}$.

We reach

$$\overline{AB} = u - [-c(\bar{e})] = u + c(\bar{e}) \text{ and } \overline{A'B'} = 100 - c(\bar{e}) - [-c(\bar{e})] = 100,$$

$$\text{and thus } \frac{q}{l} = \frac{u + c(\bar{e})}{100}.$$

The salary should be

$$w = \frac{u + c(\bar{e})}{100} 100 + 20 = u + c(\bar{e}) + 20.$$

Remembering the worker's payoff formula

$$u = w - 20 - c(e),$$

one can easily verify the accuracy of the original hypothesis, which we aimed to demonstrate.

Since the employer can choose which salary to offer from a defined range, one may note that not all the points on this line are achievable. The obtainable payoffs correspond to a finite group of points belonging to a segment of the isoeffort line. Let us define these points as *isoeffort points*.

We can plot the group of payoffs corresponding to the same level of the salary \bar{w} . To do this we exploit the geometric property demonstrated earlier and we calculate the couples (u, π) on each level of the isoeffort line which correspond to the subdivisions $0, \frac{1}{4}, \frac{1}{2}$ and $\frac{3}{4}$, corresponding to the salaries

$$20 = 0 \cdot 100 + 20,$$

$$45 = \frac{1}{4} 100 + 20,$$

$$70 = \frac{1}{2} 100 + 20$$

$$\text{and } 95 = \frac{3}{4} 100 + 20.$$

In this way we obtain the isosalary curves relative to $\bar{w} = 20$, $\bar{w} = 45$, $\bar{w} = 70$ and $\bar{w} = 95$. Thus, taking into account the geometric properties, we have the topographic points necessary, given a point (u, π) on the map, to discern the relative salary.

It is possible to demonstrate that by using a good adaptation index, the isosalary curve can be approximated to one branch of a parabola with the concave side facing down. Since demonstrating this is laborious, we do not recount it here, considering it sufficient to mention the fact that this mathematical adaptation exists. We must, however, emphasise that calling this “a curve” is not really appropriate since in reality it is a group of ten points, which are joined in the graph to form an approximation for a quicker visual reading of the data.

Furthermore, the bisector of equal payoffs is the point corresponding to equal payoffs between employer and employ that is $u = \pi$. The payoff frontier is the geometric location of points which correspond to optimal payoffs. The intersection between the frontier and the bisector, indicated in the graph by E, represents the *maximum workplace welfare achievable with equal payoffs for employer and employee*. Since it is a point in the frontier, it is an efficient point. We deduce further that this point lies in correspondence to the intersection between the isoeffort line $\bar{e} = 1 = e_{\max}$ and the bisector. The equation of the isoeffort line $\bar{e} = 1$ is:

$$\pi = -u + 82$$

Whilst the equation of the bisector is:

$$\pi = u$$

Plotting an intersect between the two lines we obtain $u = \pi = 41$, for which we can confirm that the point E has coordinates (41; 41).

From the map in the graph we see that the salary corresponding to E must lie between 70 and 95. To find the salary it is sufficient to resolve the following equation:

$$41 = w - 20 - c(1) \Rightarrow 41 = w - 20 - 18 \Rightarrow 41 = w - 38$$

From which we see that $w = 79$.

Using this salary the maximum effort level to calculate the worker’s payoff, we obtain:

$$\pi = (120 - 79) \cdot 1 = 41$$

Which is the same profit as the worker.

Summarising everything demonstrated so far, we can state that: the maximum equity payoff corresponds to the point $E(41;41)$; point E is given by the intersection between the bisector and the frontier; being a point on the frontier it is also an efficient point; it corresponds to the choices $w = 79$ and $e = e_{\max} = 1$.

References

- Akerlof, G. (1982) "Labor Contracts as Partial Gift Exchange", *Quarterly Journal of Economics*, 114, 1243-1284.
- Akerlof, G. and Yellen J. (1990) "The fair Wage-effort Hypothesis and Unemployment" *Quarterly Journal of Economics* 105, 255-283.
- Aldrich, H., Hodgson G.M., Hull D.L., Knudsen T., Mokyr J. and Vanberg V.J. (2008) "In Defence of Generalized Darwinism", *Journal of Evolutionary Economics*, **18**(5), October, pp. 577-96.
- Alexander, R. D. (1987) "*The Biology of Moral Systems*", New York: Aldine de Grueter.
- Andreoni, J. (1989) "Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence". *Journal of Political Economy* 97(6), December, 1447-58.
- Andreoni, J. (1990) "Impure Altruism and Donations to Public Goods: A Theory of Warm- Glow Giving". *Economic Journal* 100(401), June, 464-77.
- Andreoni, J. and Miller, J.H. (2002) "Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism" *Econometrica* 70(2), March, 737-53.
- Appelbaum, E.; Bailey, T.; Berg, P. and Kalleberg, A. L. (2000) "Manufacturing Advantage. Why High-Performance Work Systems Pay Off" Ithaca, NY: ILR Press.
- Aristotle (1979) "*Etica Nicomachea*", Rusconi, Mulino.
- Ashraf, N., I. Bohnet, and N. Piankov (2006) "Deconomposing Trust and Trustworthiness". *Experimental Economics* 9(3): 193-208.

Auquier Mie and James G. March (fall, 2001) "Conflict of Interest in Theories of Organisation: Herbert A. Simon and Olivier E. Williamson", *Journal of Management and Governance*.

Axelrod, R. and W.D. Hamilton (1981) The evolution of cooperation. *Science*, CCXI, p. 1390-1396.

Axelrod R. (1984) "*The Evolution of Cooperation*", Basic Books, New York.

Axelrod, R. (1986) "An Evolutionary Approach to Norms". *American Political Science Review* 80(4): 1095-1111.

Barber, B. (1983) "*The Logic and Limits of Trust*", New Brunswick, NJ: Rutgers University Press.

Benedict, R. (1934) *Patterns of Culture*. Boston: Houghton Mifflin.

Benoit, J.-P. and Krishna, V. (1985) "Finitely Repeated Games", *Econometrica* 53, 905-922.

Berg, J., Dickaut, J. and McCabe K., (1995) "Trust, Reciprocity and Social History", *Games and Economic Behavior*, 10, 122-42.

Bewley, T. (1995) "A Depressed Labor Market as Explained by Participants". *American Economic Review*, Papers and Proceedings 85, 250-254.

Blau, P. (1964) "*Exchange and Power in Social Life*", New York: John Wiley and Sons.

Blau, P. (1994) "*Structural Contexts of Opportunities*", Chicago: University of Chicago Press.

Bollen, K.A. and R.H. Hoyle (1990) "Perceived cohesion: a conceptual and empirical examination", *Social Forces*, **69** (2), 479-504.

Bowles, S. (1998) “Endogenous Preferences: The Cultural Consequences of Markets and Other Economic Institutions”, *Journal of Economic Literature*, **36**(1), March, pp. 75-111.

Bowles, S. (2004) *Microeconomics: Behavior, Institutions, and Evolution*, Princeton, NJ and New York: Princeton University Press and Russell Sage Foundation.

Bowles, S. and Gintis, H. (eds) (2005) *Moral Sentiments and Material Interests: The Foundations of Cooperation in Economic Life*, Cambridge, MA: MIT Press.

Bowles, S. and Gintis, H. (2011) *A Cooperative Species: Human Reciprocity and its Evolution*, Princeton, NJ: Princeton University Press.

Boyd, R. and Richerson, P. J. (1985) “*Culture and the Evolutionary Process*”, Chicago: University of Chicago Press.

Brewer, M.B. and W. Gardner (1996) “Who is this “we”? Levels of collective identity and self representations”, *Journal of Personality and Social Psychology*, **71** (1), 83-93.

Bruni, L. (2006) “*Reciprocità: Dinamiche di cooperazione economia e società civile*”, Mondatori, Milano.

Camerer, C., and R. Thaler (1995) “Ultimatums, Dictators, and Manners,” *Journal of Economic Perspectives*, IX, 209–219.

Camerer, C. F. and Fehr, E. (2006) “When Does “Economic Man” Dominate Social Behavior?”, *Science*, **311**, 6 January, pp. 47-52.

Charness, G. and Rabin, M. (2002) “Understanding Social Preferences with Simple Tests”, *Quarterly Journal of Economics*, **117**, 817-869.

Clark, M.S. and J. Mills (1979) "Interpersonal attraction in exchange and communal relationships", *Journal of Personality and Social Psychology*, **37** (1), 12-24.

Clark, M.S. (1981), "Noncomparability of benefits given and received: a cue to the existence of friendship" *Social Psychology Quarterly*, **44** (4), 375-81.

Clark, M.S. (1984) "Record keeping in two types of relationship", *Journal of Personality and Social Psychology*, **47** (3), 549-57.

Clark, M.S., R. Oulette, M.C. Powell and S. Milberg (1987) "Recipient's mood, relationship type, and helping", *Journal of Personality and Social Psychology*, **53** (1), 94-103.

Chance, M.R.A. (1988) "Introduction", in M.R.A. Chance (ed.), *Social Fabrics of the Mind*, London: Erlbaum, pp. 1-35.

Cialdini, R.B., S.L. Brown, B.P. Lewis, C. Luce and S.L. Neuberg (1997), "Reinterpreting the empathy-altruism relationship: when one into one equals oneness", *Journal of Personality and Social Psychology*, **73** (3), 481-94.

Coase, R. (1937) "The nature of the firm", *Economica*, 4, 386-405.

Coleman, J. (1990) "*Foundations of Social Theory*". Cambridge, Mass: Harvard University Press.

Cosmides, L. and J. Tooby (1992) "Cognitive adaptations for social exchange", in J.H. Barkow, L. Cosmides and J. Tooby (eds), *The Adapted Mind. Evolutionary Psychology and the Generation of Culture*, Oxford: Oxford University Press, pp. 163-228.

Croson, R. (1996) "Partners and Strangers Revisited", *Economics Letters* 53, 25-32.

Darwin, C. R. (1871) *“The Descent of Man, and Selection in Relation to Sex”*, 2 vols, London: Murray and New York: Hill.

Dasgupta, P. (1988) “Trust as a Commodity.” In *Trust; Making and Breaking Cooperative Relations*, D. Gambetta, ed., 49-72. Oxford: Basil Blackwell.

Davis, L.E. (1971) “The coming crisis for production management: technology and organisation”. *International Journal of Production Research*, 9, pp. 65-82.

Dawkins, R. (1976) *“The Selfish Gene”*, Oxford: Oxford University Press.

Dawkins, R. (1979). “Twelve misunderstandings of kin selection,” *Z. Tierpsychol.* 51:184–200.

Deutsch, M. (1975), “Equity, equality, and need: what determines which value will be used as the basis of distributive justice?”, Clark, M.S. and J. Mills (1979), “ Interpersonal attraction in exchange and communal relationships”, *Journal of Social Issue*, **31**, 137-49.

De Vos, H. And Wielers R. (2003) “Calculativeness, trust and the reciprocity complex: is the market the domain of cynicism?” in Nooteboom, B. And Six, F. (eds) *The trust Process in Organizations: Empirical Studies of the Determinants and the Process of Trust Development*” Cheltenham: Elgar.

De Waal, F. B. M. (1989) “Food sharing and reciprocal obligations among chimpanzees” *Journal of Human Evolution* 18:433-459.

De Waal, F. B. M. (1996) *“Good Natured: The Origin of Right and Wrong in Humans and Other Animals”* (Cambridge, MA: Harvard University Press).

De Waal, F. B. M. (2006) *“Primates and Philosophers: How Morality Evolved”*, Princeton: Princeton University Press.

Dufwenberg M. and Kirchsteiger G. (2004) “A theory of sequential reciprocity”, *Games and Economic Behavior* 47, 268-298.

- Durkheim, E. (1951). “*Suicide, a Study in Sociology*”. New York: Free Press.
- Engelman, D. and Fischbacher, U. (2009) “Indirect Reciprocity and Strategic Reputation Building in an Experimental Helping Gam”, *Games and Economic Behavior*, **67**(2), November, pp. 399-407.
- Falk A. and Gächter, S. (2002) “Reputation and Reciprocity: Consequences for the labour Relation”, *Scandinavian Journal of Economics* 104, 1-26
- Falk, A. and Fischbacher, U. (2006). “A theory of reciprocity”, *Games and Economic Behavior*, vol. 54(2), pp. 293–315.
- Fehr, E., Kirchsteiger, G. and Riedl, A. (1993) “Does Fairness Prevent Market Clearing? An Experimental Investigation”, *Quarterly Journal of Economics* 108, 437-460.
- Fehr, E., Gächter, S. and Kirchsteiger, G. (1997) “Reciprocity as a contract enforcement device: experimental evidence”, *Econometrica* vol. 65 n. 4 833-860.
- Fehr, E. and Falk, A. (1999) “Wage Rigidity in a Competitive Incomplete Contract Market”, *Journal of Political Economy* 107, 106-134.
- Fehr, E. and Schmidt, K. M. (1999) “A Theory of Fairness, Competition and Co- operation.” *Quarterly Journal of Economics* 114, 817-868.
- Fehr, E. and Gächter, S. (2000) ‘Fairness and retaliation: the economics of reciprocity’. *Journal of Economic Perspectives*, 14, 159-181.
- Fehr, E., Klein, A. and Schmidt, K. M., (2001a) “Fairness, Incentives and Contractual Incompleteness”, Institute for Empirical Research in Economics, *Working Paper* No. 72, University of Zurich.

Fehr, E. and Schmidt, K., (2001b) “Theories of Fairness and Reciprocity – Evidence and Economic Applications”. Forthcoming in: M. Dewatripont, L.Hansen and St. Turnovsky (Eds.), “*Advances in Economics and Econometrics*” - 8th World Congress, Econometric Society Monographs.

Fehr, E. and Fischbacher, U. (2002) “Why Do Social Preferences Matter – The Impact of Non-Selfish Motives on Competition, Cooperation and Incentives”, *Economic Journal*, **112**, March, pp. C1-C33.

Fehr, E. and Fischbacher, U. (2003) “The Nature of Human Altruism.” *Nature*, **425** (6960), pp. 785–91

Fehr, E. and Gächter, S. (2002) ‘Fairness in the labour Market, A survey of Experimental Results’ in *Survey in Experimental Economics*, F.Bolle and M. Lehmann-Waffenschmidt (eds), 95-137 Physica-Verlag.

Fehr, E. and Camerer, C. F. (2007) ‘Social Neuroeconomics: The Neural Circuitry of Social Preferences’, *Trends in Cognitive Science*, **11**(1), pp. 419-27.

Field, A. J. (1981) “The problem with neoclassical institutional economics: a critique with special reference to the North/Tomas model of pre-1500 Europe”, *Explorations in Economic History*, vol. 18 no 2, April, 174-98.

Field, A. J. (2001) “*Altruistically Inclined? The Behavioral Sciences, Evolutionary Theory, and the Origins of Reciprocity*”, Ann Arbor: University of Michigan Press.

Field, A. J. (2007) “Beyond Foraging: Evolutionary Theory, Institutional Variation, and Economic Performance”, *Journal of Institutional Economics*, **3**(3), December, pp. 265-291.

Field, A. J. (2008) “Why Multilevel Selection Matters”, *Journal of Bioeconomics*, **10**(3), December, pp. 203-28.

Fox, A. (1974) "*Beyond Contract: Work Power and Trust Relations*", London: Faber & Faber.

Fox, A. (1985) *Man Mismanagement*, 2nd ed. London: Hutchinson.

Friedlander, F. (1970). "The Primacy of Trust as a Facilitator of Further Group Accomplishment." *Journal of Applied Behavioral Science* 6(4):387-400.

Frank, R. H. (1988) "*Passions Within Reason: The Strategic Role of the Emotions*" (New York: Norton).

Friedman, J. (1971) "A Non cooperative Equilibrium for Supergames", *Review of Economic Studies* 38: 1-12.

Friedman, D. and Sunder, S. (1994) "*Experimental methods: a primer for economists*", Cambridge [England] ; New York : Cambridge University Press.

Fudenberg, D. and Maskin, G. (1986) "The Folk Theorem in Repeated Games with Discounting and Incomplete information", *Econometrica*, 54.

Gabarro, J.J. (1978) "The development of Trust, Influence, and Expectations" In *Interpersonal Behaviour: Communication and Understanding in Relationships*, A.G. Athos and J.J. Gabarro, eds. 290-303. Englewood Cliffs, NJ: Prentice-Hall.

Gadagkar, R. (2010). Sociobiology in turmoil again. *Current Science*, 99(8), 1036.

Gambetta, D. (1988). "*Trust: Making and Breaking Cooperative Relations*". Oxford, Blackwell.

Gambetta, D. (2000). "Can We Trust Trust?" in: D. Gambetta (ed.) "*Trust: Making and Breaking Cooperative Relations*", Oxford: University Press.

Gintis, H. (2007) "A Framework for the Integration of the Behavioral

Sciences”, *Behavioral and Brain Sciences*, **30**(1), pp. 1-16.

Gintis, H., Henrich, J., Bowles S., Boyd, R. and Fehr E. (2008) “Strong Reciprocity and the Roots of Human Morality”, *Soc Just Res.*

Gintis, H. (2009) “*The Bounds of Reason: Game Theory and the Unification of the Behavioral Sciences*”, Princeton NJ: Princeton University Press.

Gouldner, A.W., (1954) “*Industrial Bureaucracy*”, New York: Free Press.

Gouldner, A.W., (1960) “The norm of reciprocity: a preliminary statement”, *American Sociological Review*, **25** (2), 161-78.

Greene, J. D. and Haidt, J. (2002) “How (and Where) Does Moral Judgement Work?” *Trends in Cognitive Sciences*, **6**(12), pp. 517-23.

Grusec, J. E. and Kuczynski, L. (1997). “*Parenting and Children’s Internalization of Values: A Handbook of Contemporary Theory*”. New York: John Wiley & Sons.

Guth, W., Klose, W., Konigstein, M. and Schwalbach, J. (1998) “An Experimental Study of a Dynamic Principal -Agent Relationship”, *Managerial and Decision Economics* 19, 327-341.

Hamilton, W. D. (1964) “The Genetical Evolution of Social Behavior”, *Journal of Theoretical Biology*, 7(1), July, pp. 1-32.

Hardin, R. (2006). “*Trust and trustworthiness*”. New York: Russell Sage Foundation.

Hays, R.B. (1985) “A longitudinal study of friendship development”, *Journal of Personality and Social Psychology*, **48** (4), 909-24.

Henrich, J. (2000). “Does Culture Matter in Economic Behavior? Ultimatum Game Bargaining Among the Machiguenga of the Peruvian Amazon.” *American Economic Review*. 90, 973–979.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., and McElreath, R. (2001). "In search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies." *AER Papers and Proceedings*. 91, 73–78.

Henrich, J. (2004) "Cultural Group Selection, Coevolutionary Processes and Large-Scale Cooperation", *Journal of Economic Behavior and Organization*, **53**(1), February, pp. 3-35.

Hodgson, G.M. (1988) "*Economics and Institutions: A Manifesto for a Modern Institutional Economics*", Polity Press and University of Pennsylvania Press: Cambridge and Philadelphia.

Hodgson, G.M. (1997) "The ubiquity of habits and rules", *Cambridge Journal of Economics*, 21, 663-684

Hodgson, G. M. (2002) "Reconstitutive downward causation: Social structure and the development of individual agency". In E. Fullbrook (Ed.), *Intersubjectivity in economics: Agents and structures* (pp. 159–180). London and New York: Routledge.

Hodgson, G.M. (2003) "The hidden persuaders: institutions and individuals in economic theory" *Cambridge Journal of Economics* 2003, 27, 159-175.

Hodgson, G.M. (2004a) "Veblen and Darwinism", *Institutional Review of Sociology*, 27, 159-175.

Hodgson, G.M., (2004b) "Reclaiming habit for institutional economics", *Journal of Economic Psychology*, 25, (2004) 651-660

Hodgson, G.M., (2012) "*From Pleasure Machines to Moral Communities: An Evolutionary Economics without Homo Economicus*", University of Chicago Press.

Hull, D. L. (1988) "*Science as a Process: An Evolutionary Account of the Social and Conceptual Development of Science*", Chicago: University of Chicago Press.

Hume D. (1978 (1740)) “*A treatise of Human Nature*”, Oxford University Press, Oxford.

Joyce, R. (2006) “*The Evolution of Morality*”, Cambridge, MA: MIT Press.

Karasek, R. A. (1979) “Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign.” *Administrative Science Quarterly* 24 (June) 285-308.

Keser, C. and van Winden, F. (2000) “Conditional Cooperation and Voluntary Contributions to Public Goods”, *Scandinavian Journal of Economics* 102, 23-39.

Koike, K. and Inoki, T. (eds). (1990) “*Skill Formation in Japan and Southeast Asia*”, University of Tokyo Press, Tokyo.

Kolm S., (1994) “The theory of Reciprocity and the choice of Economic Systems: an introduction”, *Investigaciones economicas*, 18 pp. 67-95.

Kreps, D., Milgrom, P., Roberts, J. and Wilson, R. (1982) “Rational Cooperation in the Finitely Repeated Prisoners Dilemma”, *Journal of Economic Theory* 27, 245-252.

Kreps, D.M. (1988) “Corporate Culture and Economic Theory” In *Perspectives on Positive Political Economy*, J.E. Alt and K.A. Shepsle, eds. 90-143. Cambridge: Cambridge University Press.

Kreps D.M. (1990) “Corporate Culture and Economic Theory”. In *Perspectives on Positive Political Economy*, J.E. Alt and K. Shepsle (eds) 90-143 Cambridge: Cambridge University Press.

Lane, C. and R Bachmann (eds.) (1998). “*Trust Within and Between Organisations*”, Oxford: Oxford University Press.

Lawler, E.E. III (1994) “From job-based competency-based organisations”. *Journal of Organisational Behaviour*, 15 (3), pp.3-15.

Lee, R.M. and S.B. Robbins (1995) "Measuring belongingness: the social connectedness and the social assurance scales", *Journal of Counseling Psychology*, **42** (2), 232-41.

Luhmann, N. (1979) "*Trust and Power*". Cirencester: Wiley.

Luhmann, N. (1988) "Familiarity, Confidence, Trust: Problems and Alternatives", in Diego Gambetta (ed.), *Trust, Making and Breaking Cooperative Relations*, Oxford: Blackwell, pp. 94-108.

Luhmann, N. (1995) "*Social systems*". Stanford: Stanford University Press.

Macaulay S. (1963) "Non-contractual relations in Business: A preliminary Study", *American sociological Review* 28: 55-66.

Mackie, J. L. (1977) "*Ethics: Inventing Right and Wrong*", Harmondsworth: Penguin.

Marsden, D., (1999) "*A theory of Employment System: Micro-Foundations of Societal Diversity*". Oxford University Press

Mayer R. C., Davis J. H. and Schoorman F. D. (1995) "An Integrative model of organisational trust". *Academy of Management Review* 20: 709-734.

Maynard Smith J. (1964) "Group selection and kin selection" *Nature* 201:145-47

Maynard Smith, J. (1982) "*Evolution and the Theory of Games*", Cambridge University Press, Cambridge.

McKnight, D., and Chervany, N. (2001) "Trust and distrust definitions: One bite at a time" In: R. Falcone, M. Singh & Y.-H. Tan (Eds.), "*Trust in cyber-societies: Integrating the human and artificial perspectives*" (pp. 27-54). Berlin: Springer Verlag.

Mead, M. (1963). *“Sex and Temperament in Three Primitive Societies”*. New York: Morrow.

Milgrom, P. e J. Roberts (1988) “An economic approach to influence activities in organisations”, *American Journal of Sociology* 94 S154-S179.

Milgrom, P. e J. Roberts (1992) *“Economics, Organisations and Management”*. Englewood Cliffs, NJ.: Prentice-Hall.

Milinski, M., Semmann, D. and Krambeck, H.-J. (2002) ‘Reputation Helps Solve the “Tragedy of the Commons”’, *Nature*, **415**, 224-6.

Mill J. S. (1909 [1848]) *“Principles of Political Economy”*, London: Longmans, Green, and Co.

Nagel Thomas, 1970 *The possibility of Altruism*. Oxford: Clarendon Press.

Noorderhaven, N.G. (1996) “Opportunism and Trust in Transaction Cost Economics” in *Transaction Cost Economics and Beyond*, John Groenewegen (ed.), 105-128. Boston/Dordrecht/ London: Kuwer Accademic Publishers.

Nooteboom B., (1996) “Towards a Learning Based Model of Transactions” in *Transaction Cost Economics and Beyond*, John Groenewegen (ed.), 225-247. Boston/Dordrecht/ London: Kuwer Accademic Publishers.

Nootebom, B. (2000), *‘Learning and Innovation in Organisations and Economics’*, Oxford University Press: Oxford and New York.

Nooteboom, B. (2002) *“Trust: forms, foundations, functions, failures, and figures”*. Cheltenham, UK: Edward Elgar.

North, D. C. (1990) *“Institutions, Institutional Change and Economic Performance”*, Cambridge University Press, Cambridge.

Nowak, M.A., and Sigmund, K. (1998) “Evolution of indirect reciprocity by image scoring”. *Nature* **393**, 573–577.

Nowak, M. A. and Sigmund, K. (2005) “Evolution of Indirect Reprocity”, *Nature*, **437**, 27 October, pp. 1291-8.

Nowak, M. A. (2006) “Five Rules for the Evolution of Cooperation”, *Science*, **314**, no. 5805, 8 December, pp. 1560–1563.

O’Connell, L. (1984), “An exploration of exchange in three social relationships: Kinship, friendship and the marketplace”, *Journal of Social and Personal Relationships*, **1**, 333-45.

Ouchi W.G. (1980) “Markets, Bureaucracies and Clans”, *Administrative Science Quarterly*, **25**: 129-41.

Panchanathan, K. and Boyd, R. (2003) “A Tale of Two Defectors: The Importance of Standing for Evolution of Indirect Reciprocity”, *Journal of Theoretical Biology*, **224**(1), September, pp. 115-26.

Panchanathan, K. and Boyd, R. (2004) “Indirect Reciprocity Can Stabilize Cooperation Without the Second-Order Free Rider Problem”, *Nature*, **432**, 25 November, pp. 499–502.

Parker, S. K. and Wall, T. (1998) “*Job Design and Work Design: Organizing Work to Promote Well-Being and Effectiveness*” Thousand Oaks, CA: Sage.

Parker, S. K. (2003) “Longitudinal Effects of Lean Production on Employee Outcomes and the Mediating Role of Work Characteristics”, *Journal of Applied Psychology* **88** (August): 620-634

Parsons, T. (1964). “Evolutionary Universals in Society”, *American Sociological Review* **29**,3: 339-357.

Plott, Ch. (1991) ‘Will Economics Become an Experimental Science?’, *Southern Economic Journal*, **57**, 4, 901-919

Powell, Walter W. (1996) “Trust-based forms of governance” in *Trust in organisations: frontiers of theory and research*. R. Kramer and T. Tyler (eds.), 51-67.

Price, G., (1970) Selection and covariance. *Nature* **227**, 520–521.

Price, G., (1972) "Extensions of covariance selection mathematics" *Annals of Human Genetics* 35, 485–490.

Rabin, M. (1993) "Incorporating Fairness into Game Theory and Economics", *American Economic Review*, 83(5), 1281-1302.

Reed, M. (2001) "Organisation, Trust and Control: a Realist Analysis", *Organisation Studies* 22 (2), pp. 201-228.

Rempel, J. K, Holmes, J.G., & Zanna M.D. (1985) "Trust in close relationships. *Journal of Personality and Social Psychology*, 49:95-112.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998) "Not so different after all: A cross-discipline view of trust". *Academy of Management Review*, 23, 393–404.

Roth, A.E., Prasnikar, V., Okuno-Fujiware, M., and Zamir, S. (1991). "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh and Tokyo: An Experimental Study." *American Economic Review*. 81, 1068–1095.

Roth, A. E. (1995) "Bargaining Experiments," in J. Kagel and A. Roth, eds., *Handbook of Experimental Economics*, Princeton: Princeton University Press.

Rotter, J.B. (1980) "Interpersonal Trust, Trustworthiness, and Gullibility", *American Psychologist* 35, 1-7.

Rubinstein, A. (1979) "Equilibrium in Supergames with the Overtaking Criterion", *Journal of Economic Theory* 21, 1-19.

Schwartz, B. (1967), "The social psychology of the gift", *American Journal of Sociology*, 73, 1-11.

Seligman, A. B. (1997) "*The Problem of Trust*", Princeton: Princeton University Press.

Sen, Amartya K. (1987) 'Rational behaviour', in Eatwell, J., Milgate, M. and Newman, P. (eds) (1987) *The New Palgrave Dictionary of Economics*, London: Macmillan, vol. 4, pp. 68-76.

Selten, R. (1978) "The Chain Store Paradox", *Theory and Decision* 9, 127-159.

Selten, R. and Stoecker, R. (1986) "End Behaviour in Sequences of Finite Prisoner's Dilemma Supergames. A Learning Theory Approach" *Journal of Economic Behaviour and Organisation* 7, 47-70.

Shapiro, S. (1987) "The Social Control of Impersonal Trust" *American Journal of Sociology* 93, 623-658.

Sheppard, B. H. and Sherman, Dana M. Scott, W. Richard 1995 *Institutions and organizations*. Thousand Oaks: Sage.1998 'The grammars of trust: A model and general implications'. *Academy of Management Review*, 23: 422-437.

Simon H. (1951) "A formal Theory of the Employment Relationship", *Econometrica* 19:293-305.

Simon, H. A. (1990) "A Mechanism for Social Selection and Successful Altruism", *Science*, 250, 21 December, pp. 1665-8.

Simon H.S. (1991) "Organisations and Markets", *Journal of Economic Perspectives* 5: 25-44.

Singh, J.(2000) "Performance Productivity and Quality of Frontline Employees in Service Organizations." *Journal of Marketing* 64 April 15-34.

Sitkin, S.B. and N.L. Roth. (1993) "Explaining the Limited Effectiveness of Legalistic: "Remedies" for Trust/Distrust", *Organisation Science* 4, 367-392.

Smith, V. (1982) "Microeconomic systems as an experimental science", *The American Economic Review*, pp. 923-955

Smith, V. (1991) *“Papers in Experimental Economics”*, Cambridge, Cambridge University press

Smith, V. (1994) “Economics in the Laboratory”, *The Journal of Economic Perspectives*, Vol. 8, No.1, pp. 113-131

Smith, V. (2002) “Method in Experiment: Rhetoric and Reality”, *Experimental Economics*, 5 (2), pp. 91-110

Sobel, J. (1985) “A theory of Credibility” *Review of Economic Studies* 52(4):557-573.

Sobel, J. (2001) *“Social Preferences and Reciprocity, mimeo”*, University of California, San Diego.

Sugden R. (1984) “Reciprocity – The supply of Public Goods through Voluntary Contributions”, *Economic Journal*, vol. XCIV, 772-787.

Sugden, R. (1986) *“The Economics of Rights, Co-operation and Welfare”*, Oxford: Basil Blackwell.

Sugden, R. (1989) “Spontaneous Order”, *Journal of Economic Perspectives*, 3: 85- 97.

Sugden R. (1993) “Thinking As a Team: Toward an Explanation of Nonselfish Behaviour”, *Social Philosophy and Policy*, vol. X, 69-89.

Sugden R. (2000) “Team Preferences”, *Economics and Philosophy* 2 , vo. XVI, pp. 175-204.

Sztompka, P. (1999). *“Trust: A Sociological Theory”*, Cambridge: Cambridge University Press.

Tankersley D, Stowe CJ, Huettel SA (2007) “Altruism is associated with an increased neural response to agency”, *Nature Neuroscience* 10:150 –151.

Tancredi, Laurence (2005) *“Hardwired Behavior: What Neuroscience Reveals about Morality”*, Cambridge and New York: Cambridge University Press.

Trivers, R. L. (1971) “The Evolution of Reciprocal Altruism”, *Quarterly Review of Biology*, **46**(1), pp. 35-57.

Uchida, S. and Sigmund, K. (2009) “The Competition of Assessment Rules for Indirect Reciprocity”, *Journal of Theoretical Biology*, online, doi:10.1016/j.jtbi.2009.11.013

Uehara, E.S. (1995), “Reciprocity reconsidered: Gouldner’s “moral norm of reciprocity” and social support”, *Journal of Social and Personal Relationships* **12** (4), 483-502.

Van Tilburg, T. (1992), “Support networks before and after retirement”, *Journal of Social and Personal Relationships*, **9**, 433-45.

Vercoe, M. and Zak, P. J. (2010) “Inductive Modeling using Causal Studies in Neuroeconomics: Brains on Drugs”, *Journal of Economic Methodology*, **17**(2), June, pp. 133-46.

Vivenza G. (2004) “Per una teoria dell’interpretazione del concetto di reciprocità”, *“Etica ed Economia”*, 2, 73-100

Webley, P. and S.E.G. Lea (1993), “The partial unacceptability of money in repayment for neighborly help”, *Human Relations*, **46** (1), 65-76.

Wedekind, C., Milinsky, M. (2000) “Cooperation Through Image Scoring in Humans”. *Science* 288, 850-852.

Williams, G. C. (1966) *“Adaptation and Natural Selection”* , Princeton, NJ; Princeton University Press.

Williamson, O.E. (1975) *“Markets and Hierarchies”*, New York: Free Press.

Williamson, O.E. (1979) “Transaction cost- economics: the governance of contractual relations”, *Journal of Law and Economics*, **22**, 233-261.

Williamson, O.E. (1985) “*The economic Institutions of Capitalism: Firms, Markets and Relational Contracting*”, London: Macmillan.

Williamson, O.E. (1993) “Calculativeness, Trust and Economic Organisation”, *Journal of Law & Economics* 36, 453-486.

Williamson, O.E. (1996) “Efficiency, Power, Authority and Economic Organisation” in *Transaction Cost Economics and Beyond*, John Groenewegen (ed.), 105-128. Boston/Dordrecht/ London: Kuwer Academic Publishers.

Williamson, O.E. (1995) “Transaction Cost Economics and Organization Theory” in Williamson, O.E (ed.) “*Organization Theory: From Chester Barnard to the Present and Beyond*”. Oxford University Press.

Williamson, O.E. (1999) “Strategy research: governance and competence perspectives”, *Strategic Management Journal*, 20, 1087-1108.

Wilson, D.S., (1980) “*The Natural Selection of Populations and Communities*”, Benjamin/Cummings, Menlo Park, CA.

Wittex, R. (1999) “*Interdependence and Informal Control in Organisations*”, Amsterdam: Thela Thesis.

Zak, P. J. (2004) “Neuroeconomics”, *Philosophical Transactions of the Royal Society of London*, **B**, **359**, pp. 1737-48.

Zand D.E. (1972) “Trust and Managerial Problem Solving”, *Administrative Science Quarterly* 17, 229-239.

Zucker, L. (1986) “Production of Trust: Institutional Sources of Economic Structure, 1849-1920”, *Research in Organisational Behaviour*, B.M. Staw and L.L. Cummings, (eds). 8, 53-111.