ECONOMIC PERSPECTIVES ON CULTURAL EVOLUTION: ECONOMIC INSTITUTIONS AND EVOLUTION OF SOCIAL NORMS

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Abstract

Recent game theoretical studies illustrate that mutual trust among people is what a society needs to be able to sustain a market order on a long-term basis and at reasonable transaction costs. In this context, social norms play a crucial role in the evolution of the economic structure. On the other hand, the evolution of the market structure and other economic institutions means something more than simply a change in the ways of allocation of goods and resources and has a profound effect on social norms and values that form our preferences. In this paper, by drawing on the game theory literature, we first explore the role played by social norms and generalized morality in the expansion of markets. Secondly, by using the endogenous preferences model, we discuss how these social norms can be influenced by the evolution of the economic structure. The last part of the paper is a case study on conversion to Islam in Sub Saharan Africa, in which we test the relevance of our theoretical arguments.

Özet

Son dönemdeki oyun teorisi çalışmaları toplumun düşük işlem maliyetli bir piyasa düzenini uzun vadede sürdürebilmek için bireyler arasındaki karşılıklı güven ilişkisine ihtiyaç duyduğuna işaret eder. Bu bağlamda, sosyal normlar iktisadi yapının evriminde belirleyicidirler. Diğer yandan, piyasanın ve diğer iktisadi kurumların dönüşümü sadece malların ve kaynakların tahsisinden öte tercihlerimizi şekillendiren sosyal normlar ve değerler üzerinde belirleyici rol oynar. Bu makalede, oyun teorisi literatürü üzerinden örneklerle, öncelikle sosyal normlarin ve genel ahlak yapısının piyasalarin gelişmesindeki rolünü inceleyeceğiz. İkinci olarak, endojen tercihler modeli üzerinden sosyal normlarin iktisadi yapının evrim sürecinde nasıl değişebileceğini tartışacağız. Son bölümde ise Sahara Altı Afrikasmda Müslümanlığa geçiş süreci üzerine yapılan çalışmalar üzerinden teorik argümanlarımızın geçerliliğini sınayacağız.

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1. Introduction

The mutual relationship between social norms and economic behavior has usually been overlooked in the mainstream economic literature. In one of his works, Thomas Hobbes had said *"[Let us] ...return again to the state of nature, and consider men as if but even now sprung out of the earth, and suddenly (like mushrooms), come to full maturity, without any kind of engagement with each other"* (Hobbes, [1651] 1949:100). For a long time economists followed Hobbes' mushroom metaphor and chose to "take the individuals as they are" by abstracting them from the ways the society shapes the development of its members.

Recent game theoretical studies illustrate that mutual trust among people is what a society needs to be able to sustain a market order on a long-term basis and at reasonable transaction costs. In this sense, social norms play a crucial role in the evolution of the economic structure. On the other hand, the evolution of the market structure and other economic institutions means something more than simply a change in the ways of allocation of goods and resources. Evolution of the economic structure has a profound effect on social norms and values that form our preferences. Hence, both economic structure and social structure evolve in a dialectical relationship.

In this paper we will first emphasize the role played by social norms and a generalized morality in the expansion of markets. Secondly, we will analyze how these social norms can be influenced by the evolution of the economic structure. The last part of the paper is a case on conversion to Islam in Africa, in which we will test the relevance of our theoretical arguments.

2. The Role of Generalized Morality in the Expansion of Markets

Weber defines the market community as "the most impersonal relationship of practical life into which humans can enter with one another". He continues to explain "this is not due to potentiality of struggle among the interested parties which is inherent in the market relationship.... The reason for the impersonality of the market is its matter-of-factness, its orientation to the commodity and only to that" (Weber, [1922] 1978:636). This definition of market society is in total accordance with the assumptions of neoclassical economics in the sense that "in complete contracting world of Walrasian

economics there is little reason for an economic actor to be concerned about his exchange partners psychological makeup or moral commitments; moreover there is no way that these personal traits could be affected if one were so concerned" (Bowies, 1998:78).

However, where contracts are incompletely specified or costly to enforce the ex-post bargaining process gains importance. Opportunist actors tend to reappear in the world of incomplete contracts where the exchange depends on the normative commitments and psychological makeup of the parties. Hence, mutual trust among people becomes a crucial factor to sustain a market order on a long-term basis and at reasonable transaction costs.

At this point we can employ simple game theoretical models to deepen this argument. Our first case is a classical one-shot Prisoner's Dilemma in which there are two opportunists facing each other. In this model we assume that there is anonymity in the market and cheating does not result in the loss of reputation since the records of the individuals' past are not known by anyone. The terms defect **(D)** and cooperate **(C)** are used to represent honesty (non-cheat) and cheat respectively and each agent chooses between these strategies simultaneously. For each player expected payoff of defection is higher than cooperation so both players have a dominant strategy to defect and mutual defection **(DD)** is the unique Nash equilibrium of this game.

Table 1: Prisoner's Dilemma

		Player 2 (Opportunist)	
		C	**D**
Player 1	**C**	**12,12**	**5,15(-6)**
(Opportunist)	**D**	**15(-6), 5**	**10(-6), 10(-6)**

In the societies where the individuals have an incentive to violate the rules unilaterally as in this case, fraud and deceit will be widespread. This widespread violation of rules will result in the mutual defection equilibrium, which is Pareto inferior to mutual cooperation **(CC)**.

Under these conditions, a totalitarian state that can impose sanctions on the cheaters may have a considerable support among the citizens. Now, let us assume that cheaters are punished when detected and have to pay a fee of 6

units. If we recalculate the payoffs of defection by subtracting the fee (–6) from the previous payoffs, we see that cooperation (**C**) becomes the dominant strategy, and PD turns in to a fully privileged game with a unique equilibrium of mutual cooperation (**CC**).

Based on this simple illustration can we conclude by saying that a strong state can be the solution to our problem? Obviously our real life problems are much more complicated and there are several other factors that should be taken into account before coming to such a conclusion. Detection of the cheaters and the implementation of sanctions can be very costly in terms of both the material resources and loss of individual freedoms. As noted by Buchanan *"life in society, as we know it, would probably be intolerable if formal rules should be required for each and every area where interpersonal conflict may arise"* (Buchanan, 1975:118-119). On the other hand, due to imperfect information, this costly solution can also be largely ineffective. State cannot avoid making errors in detecting the violators and it can impose sanctions on honest people as well. If the margin of error gets very high, this policy may even result in creating an incentive to cheat for the individuals.

As pointed out by North, the pervasive presence of generalized morality in a society can prevent enforcement costs of the rules to be excessively high (North 1981:45). In this sense, moral norms act as a substitute for, or a reinforcement of, state engineered rules or control mechanisms. Mutual trust among people is a critical factor for a society to be capable of sustaining a market order on a long-term basis and at reasonable transaction costs. Following Dasgupta's definition we can define trust *"as correct expectations about the actions of other people that have a bearing on one's own choice of action"* (Dasgupta, 1988:51).

To illustrate the importance of trust we will now change the pay-off structure of the classical prisoners dilemma game (Platteau, 1994:759). In the second case (the assurance game) we assume that actors now have a predisposition toward cooperation (honesty) in the sense that they derive a positive utility from it. So the second model includes not only the material payoffs but non-material payoffs as well. Cooperator is someone who possibly through intensive cultural conditioning, has enhanced a genetically endowed capacity to experience a moral sentiment that predisposes him to cooperate. On

the other hand a defector is someone who either lacks this capacity or failed to develop it (Frank, 1988:57).

Table 2: Assurance Game

		Player 2 (Honest) C	D
Player 1	C	**20,20**	**5,15**
(Honest)	**D**	15,5	**10,10**

As can be seen in Table 2, this time the game has multiple equilibria **(CC)** and **(DD)** and the Pareto-optimal outcome **(CC)** is one of them. In this context, assurance game provides an escape from the counter intuitive result where free riding is the only possible equilibrium. An important feature of this game is, if both players have assurance game structure as illustrated above and if they are aware of each other's predisposition towards honesty the players might choose to make sequential instead of simultaneous moves. Knowing the other player's payoff structure, one may take the initiative of honest acting and the other one follows after observing the first move.

However, since the records of the individuals' past are not known by anyone the honest player can never be sure about the second player's identity. Therefore we should also consider the presence of opportunists who are ready to exploit all opportunities of profit regardless of social norms or moral values. In this case the honest player (player 1) cannot know whether he is facing an honest player or an opportunist one. What he knows is, if the player 2 is an opportunist than he has a dominant strategy to cheat regardless of his strategy choice. In this case the strategy choice of the honest player would be based on his degree of trust on the player 2.

To deepen our argument let us first assign probabilities to the strategy choices of the players. P is the probability that the player 2 will be honest and choose the cooperative strategy **(C)**, and 1-p is the probability that the player 2 will cheat and choose **(D)**. With the given payoffs, player 1 will be indifferent between two strategies **[20p+5(1-p) = 15p+10(1-p)]** when the probability of facing an honest player is equal to 0.5 **(p=0.5)**. On the other hand, if player 1 thinks that the player 2 will choose the cooperative strategy with **p>0.5** he'll

cooperate and if $p<0.5$ then he will defect and cheating will be the universal practice in the society (Platteau ,1994:760).

As seen from the illustration above, mutual expectations play a crucial role in this game. In order to cooperate people must feel confident to a certain extent that the others share their honesty. In this context, p value can be defined as the degree of trust needed to yield cooperation and it is inversely related with the expected payoff from the cooperative strategy. For instance if the player gets 30 instead of 20 from mutual cooperation, $p>0.25$ will be sufficient for the player to choose the cooperative strategy. Thus, another important implication of the model is that if there are many would- be honest agents who however believe that many people around them are not similarly given to honest urges no honest equilibrium will arise. This brings us to the role of ideology on the strategy choices of the individual. Individuals choose a certain path out of several competing rationalizations or ideologies to reach normative judgments on different issues in different spheres of social life. Ideology is closely interrelated with moral and ethical judgments about the fairness of the world, as the individuals perceive.

An experiment conducted in Cornell University would be useful to show how the individuals' perception of the world the may influence the strategy choices of the individuals and promote or inhibit cooperative behavior. Frank, Gilovich and Regan (1993) held a survey among the first year undergraduate students in Cornell University to assess whether the economics training inhibits cooperation.

In this experiment, subjects divided into three different groups (A, B and C) were asked to complete the questionnaire on two occasions: first during the initial week of classes and then during the final week of classes in December. Students from Group A and group B were first year economics students. Group A was taking introductory microeconomics from a mainstream economist who placed heavy emphasis on prisoner's dilemma and its strategic assumptions based on self-interest. On the other hand, the other group B was taking the same class from a different instructor who was a specialist in economic development in Maoist China. The second instructor had also assigned a mainstream introductory text, so the students were familiar to the basic concepts of game theory but he did not emphasize such material to the same degree. The third group, C was a non-economist control group chosen among first year astronomy

students. Another important point is that all students were more or less at the same age so age difference can be eliminated as a possible effect on their strategies.

The questionnaire had four questions based on a pair of ethical dilemmas. In one of the dilemmas, the owner of a small business is shipped ten microcomputers although he is billed for only nine of them. Based on this case subjects were asked to estimate first the likelihood of the owner to inform the company of the error and then to indicate how likely they would point out the error if they were the owner. The other dilemma was about a lost envelope containing $100 and the bearers name and address on it. Again the subjects are asked to estimate the likelihood of a stranger returning the money and then to estimate their own likelihood of returning the money if they were the one finding the envelope. So the questionnaire had the following four questions:

Question 1: Does owner report billing error?

Question 2: Do you report billing error?

Question 3: Does stranger return your lost $100?

Question 4: Do you return stranger's lost $ 100?

For each of the four questions, the student was coded as being "more honest" if the probability of honest behavior estimated for that question rose at the end of the semester; "less honest" if the probability fell during the semester and "no change" if the probability remained the same over time.

One may think that knowing the ideological reputations of the two professors, a disproportionate number of less cynical students could choose to take the class from the instructor B and this could totally change the interpretation of the survey results. However, the average values of initial responses to the four questions were the same for both groups. Moreover, since the figure shows not the level of cynicism but the change in that level for a particular group, even if the students in Group A were more cynical at the beginning of the semester it does not hide the fact that they became more so during the semester.

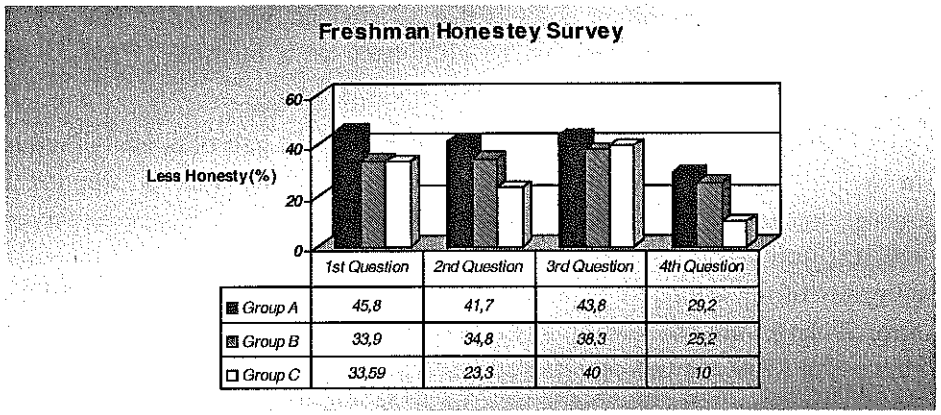

Figure 1: Freshmen honesty survey results

Source: Frank, Gilovich and Regan, 1993.

The results for two groups of economists (group A and B) plus the group of non-economists (group C) are summarized in the figure above. The graphic shows the proportion of each class reporting a "less honest" result at the end of the semester than at the beginning. As indicated by the graphic, subjects who took the economics class from a mainstream economist (group A) showed greater movement toward less honest responses than the ones taking the class from another instructor and the astronomy students. Group B, in turn, showed a greater movement toward less honest responses compared to the astronomy students. To sum up the evidence suggests that the level of exposure to neo-classical economics and its assumptions inhibits cooperative behavior.

An important conclusion that can be drawn out from this survey is the relationship between the individuals' worldview and their strategy choices. Answers to the first and third questions show the individuals' perception of the society as honest or not. As can be observed from the results, change in the individuals' perception of the outside world (their expectations regarding the rest of the society) is closely related with the change in their strategy choices (answers to the second and fourth questions).

A variety of studies suggest a large difference in the extent to which economists and noneconomists behave self interestedly (Marwell and Amews 1981, Yezer, Goldfarb and Poppen 1996, Frank, Gilovich and Regan 1993). In another experiment conducted by the same scholars (Frank, Gilovich and

Regan) a group of subjects involving both economics majors and non-majors were coupled to play a one-shot prisoner's dilemma game. In different forms of the game the results always confirmed the prediction that the percentage of cooperation among economists would be considerably lower than non-economists.

Mainstream economics training portrays a world consisting of individuals pursuing nothing else but their self-interest. In this conceptual world there is no room for ethical beliefs or social norms, which play a significant role in real life interactions. Being subject to the economics training many economics students develop a similar worldview where maximizing their material wealth regardless of any other criteria is of crucial importance for survival. In this sense maximizing self-interest is a matter of being a good player in a game where no ethical rules apply.

3. Explaining the Determinants of Cultural Evolution: Cultural Equilibrium Model

One major flaw of game theoretical models is placing too much emphasis on the material interests in explaining the evolution of the social norms and disregarding the internal dynamics of cultural evolution. As suggested by Bowles:

> *"Evolutionary game theoretical models typically abstract entirely from the process of cultural evolution, representing [material] payoffs associated with particular traits as if they were the only influences on the replication of trait"*
>
> (Bowles, 1988: 82).

While building a model, we cannot take the individual *per se* as isolated from the society. We should also consider the social dynamics that play a significant role on the individual's decisions. In contrast to homo economicus, real life men are social animals deriving social comfort from the other members of the society. As the individuals deviate from dominant norms of the society, they may lose their social status and endure rejection. On the other hand, society is also a source of physical comfort. Through participation in the social system, individuals may gain access to goods and services that they could not acquire on their own.

In this context, understanding the dynamics of conformism would be helpful to explain how a particular trait, which is more advantaged in terms of replication may diffuse in a population even if the economic benefits associated with this trait are inferior compared to alternative cultural traits.

3.1. Conformism as a Determinant of Cultural Evolution

The dominance of a trait in a population may enhance the replication propensity of each representative of that trait, independently of the payoff to those exhibiting the trait. This process is named as "conformist transmission" (Bowles, 1988:83). Studies that aim to explain conformism concentrate on two main points:

1- Imitation may be advantageous when the investigation of relevant payoffs (learning) is costly. As pointed out by Boyd and Richerson (Boyd and Richardson, 1985) under quite general conditions where learning is very costly, conformist transmission may be efficient in the sense that an individual who adopts particular traits by simply imitating the others will do better than those who engage in costly investigation of the relevant payoffs.

2- The problem may be too complex for an individual to solve by himself so the conformism may emerge as an individual effort to escape from the limitations of ones own senses.

Sharing this second approach Solomon Ash hypothesized that facing simple problems where the individuals can rely on his own judgments they would be immune to group pressures. Ash conducted an experiment in 1940's to test this argument and ended up disproving his own hypothesis.

In the experiment subjects were asked to match the length of a given line with one of the other three lines. However, all but one of the members was instructed to provide unanimously wrong answers and the remaining member was unaware of this prearrangement. Hearing other subjects respond unanimously with answers contradicting his own judgments in 32 percent of the trials he goes along with the wrong view of the majority. On the other hand when the subjects are asked to judge individually the rate of wrong answers falls

to less than 1 percent. The power of group pressure can be easily understood from the differences in the rates of wrong answers (Kuran, 1995:26-27).

As Kuran notes "in daily life deviants are routinely made to feel uncomfortable, so among strangers people consider dissent imprudent. Justified or not, they feel pressured to fit in, lest they be pushed out" (Kuran, 1995:26). Studies on conformism show that to increase the explanatory power of the models more emphasis should be placed on the social costs of the deviant behavior. Ash experiment also points out that causes of conformism is partly rooted in human psychology,

An historical example quoted by Axelrod clearly illustrates how the conformism effect may offset the material gains from an alternative trait and cause an individual to choose a strategy that in no way can be explained with the assumptions of rationality (Axelrod, 1997).

In 1804 Aaron Burr challenged Alexander Hamilton to a duel. Hamilton sat down the night before the duel was to take place and wrote down his thoughts. He gave five reasons against accepting the duel: his principles were against shedding blood in a private combat forbidden by law; he had a wife and children; he felt a sense of obligation toward his creditors; he bore no ill against colonel Burr; and he would hazard much and gain little. Moreover he was reluctant to set a bad example by accepting a duel. Yet he did accept, "because the ability to be useful, whether in resisting mischief or effecting good, in those crises of our public affairs which seem likely to happen, would probably be inseparable from a conformity with public prejudice in this particular" (Axelrod, 1997:44-45).

The prospect of sanctions imposed by the general public in support of dueling caused Hamilton to risk, and ultimately to lose his life. Considering high social costs accompanied with alternative traits, we could easily say that conformism had a huge impact on the evolvement of this norm. However, this argument by itself is not enough to explain how certain social norms, which dominated the societies for centuries, tend to disappear overtime. For a better understanding of cultural evolution it would be useful to construct a model including the payoff effect and the conformism effect for alternative traits.

3.2. Cultural equilibrium: Conformism versus Material Gains

In his work titled "Endogenous Preferences", Bowles introduced a cultural equilibrium model to explain the conformist transmission (Bowles, 1998). Cultural equilibrium can be defined as the frequency of cultural traits within a society. The basic intuition of this model is that "the distribution of cultural traits in a population is determined as the equilibrium of a system whose exogenous elements are subject to long-term influence of markets and other economic institutions" (Bowles,1998:83). As in the evolutionary game theoretical models, economic institutions affect the evolution of preferences by changing these exogenous determinants of cultural equilibrium. However, economic structure is not the only determinant of cultural evolution, cultural structure also has its own internal dynamics and the conformism effect may enhance the replication propensity of a certain trait independent of the payoff structure.

In this model we begin by assuming the existence of two mutually exclusive cultural traits x and y where $\mathbf{r_x}$ and $\mathbf{r_y}$ are the replication propensities of each trait. Each individual is a cultural model himself and r can also be defined as the number of copies of each model that the individuals make at the end of each period, possibly a generation.

Members of the population are paired to play a two-person game. Agents choose the strategy dictated by their trait (x or y), where the payoffs are denoted as π (x,y) showing the payoff of playing trait x against the trait y. The game can be based on the exchange of goods or any other kind of economic interaction. For any population frequency, $\mathbf{p \in [0,1]}$, of the x trait, $\mu_{xy}(\mathbf{p;\delta})$ can be defined as the probability of being paired with a y player (playing the y trait) conditional on being an x player where $\delta \in [0,1]$ "is a measure of the exogenously determined extent to which pairing is nonrandom". If pairing is completely random, then $\delta=0$, and the probability of meeting an x player is simply p regardless of one's own type: $\mu_{xx} = \mu_{yx} = p$. On the other hand, sometimes the frequency of a particular trait may depend on the geographic location (residence), occupation, class identity, ethnic identity or religious identity, in this case in different social groups or in different places the probability of one's meeting a certain type may exceed that given by the population frequency: $\delta>0$.

Based on these definitions the expected payoffs of traits x and y can be formulated as:

$\mathbf{b_x(p;\delta)= \mu_{xx}\pi\ (x,x)+ p_{xy}\pi(x,y)}$

$\mathbf{b_y(p;\delta)=\mu_{yx}\pi\ (y,x)+ \mu_{yy}\pi(y,y)}$,

where $\mathbf{b_x}$ and $\mathbf{b_y}$ are the expected payoffs of playing x and y respectively.

To detect the effect of frequency dependent conformist biases we should add a conformist bias function to our model: $\boldsymbol{\alpha(p)}$ which can be written as $\boldsymbol{\sigma_x(p-k)}$ and $\boldsymbol{\sigma_y(k-p)}$,where $\mathbf{k \in [0,1]}$ is the value of $\mathbf{p}$ for which no bias operates. For practical reasons we will assume that $\boldsymbol{\sigma_x = \sigma_y \equiv \sigma>0}$, and further we will define $\boldsymbol{\alpha \in [0,1]}$, the degree of conformism, as the weight placed on $\boldsymbol{\sigma(p)}$. Thus, the replication propensities for each trait can be formulated as below:

$\mathbf{r_x= \alpha\sigma(p-k)+(1-\alpha)[b_x(p;\delta)-b_y(p;\delta)]+1}$

$\mathbf{r_y= \alpha\sigma(k-p)+(1-\alpha)[b_y(p;\delta)-b_x(p;\delta)]+1}$

If $\mathbf{p = k}$, or $\boldsymbol{\alpha = 0}$ conformist transmission does not operate so the replication of traits depend solely on payoffs, as in conventional evolutionary game theoretic models. In the model, cultural equilibrium is defined by $\mathbf{dp/dt = 0}$, which for $\mathbf{p \in [0,1]}$ requires that the effects of conformist transmission offset the effects of unequal game outcomes so that $\mathbf{r_x=r_y=1}$, or $\boldsymbol{\alpha\alpha(p-k)/(1-\alpha)= b_y(p;\delta)-b_x(p;\delta)}$

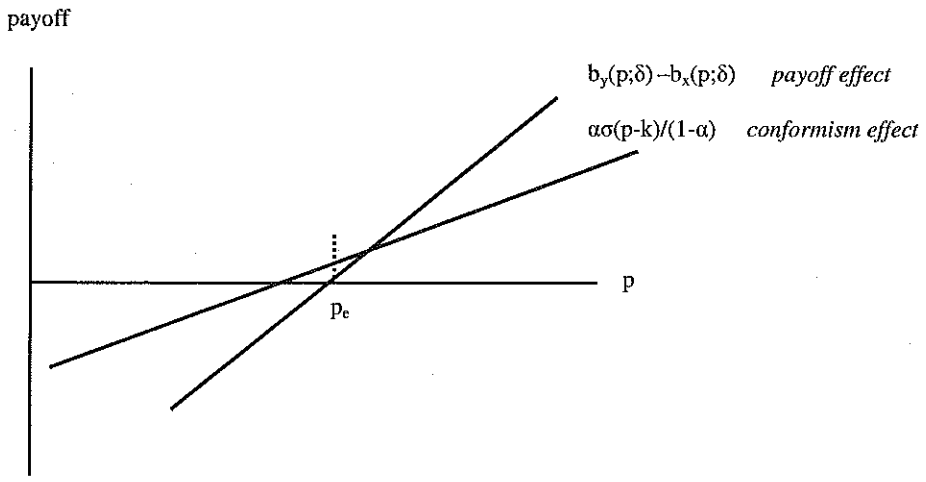

Figure 2: Cultural Equilibrium model

The cultural equilibrium illustrated above can also be defined as a stable interior equilibrium. It is stable in the sense that if $p>p_e$, then payoff effect is greater than the conformism effect $[\alpha o(p-k)/(1-\alpha) < b_y(p;\delta) - b_x(p;\delta)]$ so $r_y > r_x$. In this case p tends to fall $(dp/dt<0)$ until $p=p_e$. On the other hand if $p<p_e$, then $\alpha o(p-k)/(1-\alpha) > b_y(p;\delta) - b_x(p;\delta)$ so $r_x > r_y$ and $(dp/dt>0)$. In this sense disturbances of p will be self-correcting.

On the other hand, institutional changes can affect the distribution of cultural traits in the population by influencing the exogenous variables in the following ways:

1- The payoff structure of the model is subject to change depending on the frequency of interaction between the agents and the costs of recognition of the types. Institutional change can also alter the rules governing who interacts with whom, shown by the $\mu_{xy}(p;\delta)$ function measuring the extent of nonrandom pairing and the degree of segmentation into distinct social networks which again brings a change in the payoff structure. For instance, as the extent of non-random pairing grows detection and the exclusion of the cheaters becomes easier. A direct consequence of this change is an increase in the expected benefits from cooperation. Increase in the frequency of interaction and lower costs of detection would also motivate corporative behavior.

2- Institutional change can also alter the level of conformism and its determinants: **α, o** and **k**. Any change in the slope of the conformism function would result in a new cultural equilibrium with the given payoff structure. For instance urbanization reorganizes the society in a way that social pressure may have less influence on the individuals' decision making process. Thus the weight placed on conformist bias function tends to be lower.

4. The Role of Economic Institutions in the Evolution of Social Norms: A Case Study on the Conversion to Islam in Africa

In this part of the paper I will discuss the relevance of our theoretical arguments to the case of conversion to Islam in Africa. Historical and anthropological studies illustrate that during the expansion of Islam in Africa in the eleventh century there were relatively few military or political conversions.

This fact implies that conversion to Islam in Africa was primarily voluntary and individuals found it in their interest to convert. Obviously, a complete analysis of this conversion should account for different non-material interests as well as the material ones. Superiority of one belief system over the preexisting one in different spheres of life, and various other cultural or moral arguments would yield great explanatory strength to any case study focusing on this process. However, since our aim is restricted to detect the role of economic institutions on cultural evolution, we will leave most of these arguments aside and focus on the economic incentives as the primary motive (as opposed to conformism effect) behind this conversion process. In context, we will place the tension between the conformism effect and the payoff effect at the very center of our analysis.

4.1. Historical Background

Africa has been a focus of attention for many studies focusing on religious conversion. The main reason for its attractiveness was the existence of hundreds of different indigenous belief systems most of which were exposed to Islam or Christianity and were converted. Most scholars sought to explain conversion by looking at the compatibility of the indigenous belief systems and rituals behaviors with those of the great proselytizing world religions, especially Islam and Christianity.

Horton's "Intellectualist Theory" is a good example of these studies (Horton, 1975). According to Horton most indigenous religious systems had a two-tier cosmology including both the lesser spirits and a supreme being. The lesser spirits were involved more with the local community, while the supreme being was more involved with the world as a whole. Consequently, lesser spirits were more important for the societies with little involvement with the outside world. At this point Horton claims that, as societies were drawn in to relations with the outside world, supreme being became more and more important. For Horton, long distance trade played an important role in this process by linking these societies to the outside world (Horton, 1975: 387). However, while he accounts for the association between conversion to Islam and long distance trade he ignores the economics of trade. In short, the theory avoids bringing any economic explanation to the expansion of trade, takes it as an exogenous variable and then restricts the role played by trade to serving as a link between

societies. Another major weakness of this theory is its inability to predict conversion to Islam as opposed to Christianity.

Since both religions were more or less equally accessible at the time and that both emphasize the same supreme deity, why do people choose one but not the other. In our case, our focus will be restricted to Islamic conversion in Africa, and in contrast to former studies we will seek to explain this conversion process pointing the economic advantages offered by Islam in spite of its striking differences from the previously existing indigenous belief systems.

Most scholars agree that Islamic conversion in African history can be analyzed as three distinct periods. First one is the conversion of North Africa in the seventh century, which can be seen as a military (involuntary) conversion, a direct result of several successive Jihads (holy wars) that took place in this century. Similarly, the conversion that occurred all across Africa in the nineteenth century can be considered as a result of Jihads of the time (Ensminger, 1997:8). However, as our aim is restricted to analyze the voluntary conversions, we will be analyzing the period beginning from the eleventh century, a period of mass conversions that took place in whole West Africa and in most parts of East Africa.

4.2. The Advantages Islam Offered to Trade in Africa

An important fact acknowledged by various different studies on this issue is that it was long distance traders who did much of the converting and expansion of Islam tended to follow the trade routes. To participate in the moral community of other traders and benefit from the advantages this community could provide to its members was an important motive behind the conversion of indigenous traders in Africa. Emphasizing the significant role played by the economic incentives during the adoption of Islam does not mean that these conversions were insincere, since expediency and sincerity does not necessarily exclude each other.

To explain the dynamics of a cultural evolution first we should detect the pre-existing set of values or social norms that have been replaced by the new ones. As noted by Ensminger, anthropological studies detected the following indigenous practices (all of which are inconsistent with Islamic tradition) in large number of African societies that ultimately converted: "matrilineal descent, prominence of women in public/production arena, widespread use of

alcohol in central cultural and social activities, polygyny rates exceeding the maximum Islamic rule of four wives, patrilineal inheritance that excludes women, primogeniture, ancestor worship at the cost of neglecting the deity, absence of divorce, sanctioned pre- and extra-marital sexual relations and the consumption of blood and pork" (Ensminger, 1997:5). Also in Tringham (1962), we can find several characteristics that are not necessarily proscribed by Islam but can be argued to be incompatible with Islamic practice such as statelessness and clan exogamy.

From this perspective, by converting to Islam, an individual would be imposing restrictions on himself because he would have to give up his cultural habits that used to be a huge part of his daily life. At this point one might ask "what Islam had to offer that was so attractive that people adapted it in spite of the high social and cultural costs involved, such as abstinence from alcohol and pre- and extra-marital sex, modification of inheritance systems, descent reckoning, and marriage systems" (Ensminger, 1997:5). One of the possible answers would be the benefits Islam offered for exchange particularly long-distance trade, and especially to those who were not privileged under the pre-existing system.

Expansion of Islam throughout the region brought a fundamental change in the institutional structure that fostered the expansion of trade. "Islam provided an intermediate link to the commercial centers of North Africa and via them to the rest of the world. Islam brought a common language of trade (Arabic), a monetary system, an accounting system, and a legal code to adjudicate financial contracts and disputes" (Ensminger, 1997:7). In short, Islam provided an improved institutional structure in which hade could take place, particularly for the long distance trade.

There is also significant amount of literature suggesting that the long distance trade (especially in West Africa) predated the arrival of Islam. This argument has been supported by convincing archeological evidences from Timbutku and Jenne (Clarke, 1982:8) . However, this evidence does not necessarily conflict with our argument that Islam facilitated the intensification of long distance trade to a substantial degree. The main reason is that pre-Islamic trade was largely based on direct exchange and it did not involve credit therefore it was very insignificant compared to its later growth following the expansion of Islam in the continent (Ensminger,1987:8).

With the expansion of Islam, "commenda" (along with other Islamic credit systems) started to be widely used in Africa, and had a profound effect upon the increasing volume of trade in this region. Commenda was a contract, which regulated the use of capital, trading skills and labor for mutual profit. It enabled an investor to entrust capital to an agent-manager, who traded with it and returned the principal and a previously agreed share of profit to the investor. Credit contract and partnerships such as the commenda facilitated the expansion of trade in to new areas. As the trade expanded it became harder for the long distance traders to deal with their own business in different regions, which generated a need for agents who could deal with their businesses on their behalf.

Analyzing the expansion of trade in Africa, Last emphasizes the importance of another concept: "friends". "Friends", in the daily use of Muslim traders meant those who give goods to each other on credit. Obviously the size of this circle of friends is the main determinant of the magnitude of the trade networks. The more creditors one has, the greater the turnovers and of course greater the profit of the creditors. As stated by Last, "growth depends on the number of trading friends, not on the cheapness, necessarily, of one's wares and the number of new costumers one can thus attract" (Last,1979:239). Islam provided a strong institutional framework that served to backup these contracts. However, it is also important to note that for these institutions to work they should also be supported by a generalized set of moral values acting as a commitment mechanism. In the case of Islam, true believers had a non-material interest in holding to the terms of the contracts even if the material payoffs associated with the honest behavior tend to shrink. This brings lower transaction costs associated with doing business among fellow Muslims. As noted by Perinbam (Perinbam,1980:464) credit was sometimes given for a year, without collateral witnesses, or any other written statement and if the credit never returned it was mostly because of the wars or die insecurity of the trade routes rather than dishonesty. Even if the debtor died it was a moral obligation for his relatives to honor his debts.

4.3. Cultural Equilibrium Model and the Dynamics of Conversion

To explain the dynamics of the expansion of Islam in Africa by employing the cultural equilibrium model, we should first summarize the change in the exogenous variables of the model. With the expansion of the

Islamic trade networks, the degree of segmentation and the extent of nonrandom pairing [$\mu_{xy}(p;\delta)$] began to increase. Being a Muslim was the primary condition of being included to these networks so this process also meant the exclusion of non-Muslims and "potential cheaters" from the expanding trade networks. As we explained before, Muslim identity was also an indicator of commitment to honesty, so this process motivated the cooperative behavior and generated a positive payoff effect for the Muslims that outperformed the benefits of conformism, which initially worked in favor of the preexisting belief system.

Considering the theoretical framework of the cultural equilibrium model we could suggest a two-step conversion process in this case. The first step was the conversion of the traders (including their families) for whom the payoff effects of conversion dominated the conformism effect. The second step was the widespread conversion, which resulted in the total abandonment of the preexisting belief system in certain areas. The crucial point about this period is, in this step conformism effect began to work in favor of the Muslim traits. Traders could be considered as the wealthiest segment that had great influence on the rest of the society and their conversion to Islam created pressure on the others who had no material interest in conversion.

Another important aspect of Islam was the mechanisms built for the exclusion of free riders. As we emphasized earlier, trust played a very important role in Muslim trade networks. Without any exclusion mechanism one could easily fake as a Muslim and enter into these networks to exploit several opportunities offered by this network of trust. And of course, as the proportion of these fake Muslims grows the possibility of reaching a non-cooperative equilibrium (**D, D**) would get higher.

As we have seen in the previous example of assurance game, to avoid this outcome it is essential for the players (traders) to build reputations for "honesty" and "trustworthiness". In our case, a major way of building a reputation is for the players to show that they are true adherents to the faith (true Muslims) upon which these institutions rested. In Islam one could find various means of commitment serving as a reputation building mechanism such as praying five times a day, avoiding alcohol, sacrificing at least once a year and fasting during Ramadan. Another mechanism emphasized by Last (Last,1979:241) is reputation through pilgrimage: "To mark his entry or as often to make his claim to entry into a bigger network, the trader is likely to go on the pilgrimage, an investment of at least $200". Money spent on pilgrimage serves as a membership fee to a club that controls a trader's credit rating. Last also notes that as more and more traders begin to claim the title of Alhaji (pilgrim), further

acts of piety such as building mosques or funding other's pilgrimages may be required for an individual to keep his credit rating at the same level.

At this point, Iannacone's work on high initiation costs would be useful to deepen our argument. As the costs of participation to the network (Muslim community) gets higher, more free riders will be excluded from the community. This would increase the probability of choosing a honest strategy and bring down the transaction costs.

> "Apparently unproductive costs, such as dietary restrictions, painful initiations, and grooming requirements, can overcome free-rider problems associated with collective action. The costs can screen out people whose participation otherwise would be marginal, while at the same time increasing participation among those who remain. The indirect gains from screening and increased participation can more than offset the direct costs of the behavioral restrictions so that net group utility increases" (Iannocone, 1992: 289).

According to Iannocone, these costs are not the ideal solution because by taxing alternative activities they penalize all entrants. If they could simply exclude the uncommitted ones they would not need to impose any costs on their members. But, since detection of the uncommitted opportunists is our main problem in this particular case, the best possible solution is to impose unproductive costs on their members to detect their level of commitment to the group. Groups of perfectly "rational" people may thus embrace bizarre behavioral standards. These behaviors can be observed in non-religious collectives as well. One good example to this argument is the embarrassing initiations employed by the fraternities.

5. Conclusion

Throughout the paper we tried to explore different mechanisms by which the economic structure and the social norms evolve in a dialectical relationship. On the one hand, the evolution of social norms can reshape the payoff structures of the individuals in the economic sphere and motivate cooperative behavior; on the other hand, new institutional arrangements and emerging incentives in the economic sphere can be the primary motive behind the cultural transformation of the society.

In analyzing the economic aspects of cultural transformation, game theoretical models provide a great insight to the role of individual incentives in

the transformation process. However, we should also note that evolutionary game theoretical models oversimplify the process of cultural evolution by placing too much emphasis on the material payoffs associated with particular traits as if they were the only influences on the replication of the traits. In this sense, the cultural equilibrium model extends the limits of the evolutionary game theory by accounting for the tension between the payoff effect and the conformism effect for alternative traits.

Lastly, in the case study on conversion to Islam in Africa we sought to provide an economic explanation for a macro-social phenomenon by employing the cultural equilibrium model. Historical studies focusing on this subject show that it was long distance traders who did much of the converting and the economic incentives offered by Islam played a significant role in this conversion process. Indigenous traders in Africa converted to Islam partly because they sought to participate in the moral community of other traders and benefit from the advantages this community could provide to its members.

As a final point, to avoid reductionism, it is important to emphasize that what we aimed to explain is only certain (economic) dynamics of the cultural transformation. Although beliefs lie at the core of every religion, we sought to illustrate that economics can still offer explanations about the formation of belief systems and religious values. However, this does not mean that economic incentives are the sole dynamics of cultural change.

REFERENCES

Ames Ruth and Gerald Marweli. 1981. "Economists Free Ride. Does Anyone Else?" *Journal of Public Economics* 15: 295-310.

Axelrod, Robert. 1997. *The Complexity of Cooperation.* Princeton, New Jersey: Princeton University Press.

Bowles, Samuel. 1998. "Endogenous Preferences: Cultural Consequences of Markets and Other Economic Institutions." *Journal of Economic Literature*, 36: 75-111.

Bowles, Samuel. 2000. "Individual Interactions, Group Conflicts and the Evolution of Preferences" in *Social Dynamics*, Steven Durlauf and Peyton Young (ed), Cambridge: MIT Press.

Boyd, Robert and Peter J. Richerson. 1985. *Culture and the Evolutionary Process.* Chicago and London: University of Chicago Press.

Buchanan, James M. 1975. *The Limits of Liberty*. Chicago: University of Chicago Press,.

Clarke, Peter B. 1982. *West Africa and Islam*. London: Arnold.

Dasgupta, Partha. 1988. "Trust as a Commodity", in *Trust: Making and Breaking Cooperative Relations*, Gambetta, D (ed.), Oxford: Basil Blackwell.

Ensminger, Jean. 1997. "Transaction Costs and Islam: Explaining Conversion in Africa", *Journal of Institutional and Theoretical Economics*, 153: 4-29.

Frank, Robert H. 1988. *Passions within Reason*. New York and London: WW. Norton.

Frank, Robert H., Thomas D. Gilovich and Dennis T. Regan. 1993. "Does Studying Economics Inhibit Cooperation?" *Journal of Economic Perspectives* 7:159-171.

Frank, Robert H., Thomas D. Gilovich and Dennis T. Regan. 1996. "Do Economists Make Bad Citizens?" *Journal of Economic Perspectives* 10: 177-186.

Hobbes, Thomas. 1949. *De Cive or the Citizen*. New York: Appleton-Century-Crofts Inc.

Horton, Robin. 1971. "African Conversion", *Africa* 41: 85-108.

Horton, Robin. 1975. "On the Rationality of Conversion", *Africa* 45: 220-235.

Iannaccone, Laurence. 1992. "Sacrifice and Stigma: Reducing Free-Riding in Cults, Communes and Other Collectives." *Journal of Political Economy* 100: 271-91.

Iannaccone, Laurence. 1998. "Introduction to Economics of Religion." *Journal of Economic Literature* 36:1465-1496.

Kuran, Timur. 1995. *Private Truths, Public Lies: Social Consequences of Preference Falsification*. Massachusetts, London: Harvard University Press.

Kuran, Timur. 1997. "Islam and Underdevelopment: An Old Puzzle Revisited." *Journal of Institutional and Theoretical Economics* 153: 41-71.

Last, Murray. 1979. "Some Economic Aspects of Conversion in Hausaland." in *Conversion to Islam*. N. Levtzion (ed), New York: Holmes & Meier, 236-246.

North, Douglass C. 1981. *Structure and Change in Economic History*. New York and London: WW. Norton.

Perinbam, Marie B. 1980. "The Julas in Western Sudanese History: Long distance Traders and Developers of Resources". in *West African Culture Dynamics: Archaeological and Historical Perspectives*, B.K. Swartz, Jr. and Raymond E. Dummett (ed),The Hague: Mouton, 455-76 .

Platteau, Jean-Phillipe. "Behind the Market Stage Where Real Societies Exist-Part II: The Role of Moral Norms." *Journal of Development Studies*, 30: 753-817.

Trimingham, John S. 1962. *History of Islam in West Africa*. Oxford University Press, London.

Weber, Max. [1922] 1978. *Economy and Society: An Outline of Interpretive Sociology*. Berkeley: University of California Press.

Yezer, Anthony M., Robert Goldfarb, and Paul J Poppen. 1996. "Does Studying Economics Discourage Cooperation? Watch What We Do, Not What We Say or How We Play." *Journal of Economic Perspectives* 10: 1776-186.