

DOES COMPETITION FOSTER TRUSTWORTHINESS? AN ESSAY ON THE  
EMERGENCE OF TRUST IN A THEORETICAL AND HISTORICAL PERSPECTIVE

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**DOES COMPETITION FOSTER TRUSTWORTHINESS? AN  
ESSAY ON THE EMERGENCE OF TRUST IN A THEORETICAL  
AND HISTORICAL PERSPECTIVE<sup>^</sup>**

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**Abstract.** Recent experimental studies argue that competition yields higher levels of buyer trust and seller trustworthiness, with this having obvious desirable consequences on market efficiency. The setting analysed in these studies basically resembles the classical trust game, with the first mover (the buyer) deciding whether to purchase an item, and the second mover (the seller) deciding whether to cheat (by providing a good of a quality different from the one promised or by not shipping the good). Experimental evidence suggests that introducing competition together with some information about sellers' past choices, enhances market efficiency, given that sellers who behave dishonestly can be traced and punished with this creating strong incentives for sellers to be trustworthy (and for buyers to trust). In the first part of the paper we sketch a model to highlight the circumstances under which competition can plausibly foster trustworthiness. Differently from previous theoretical contributions we directly emphasize the time horizon of sellers as the key variable and highlight the dynamics which can lead to what we call a *trustworthy equilibrium*. The view that competition fosters trustworthiness is however made under critical scrutiny in the second part of the paper. Here we argue that technological changes have made competition neither a necessary nor a sufficient condition for trustworthiness. Historically this has opened the room to public regulation, investments in brand names and Corporate Social Responsibility (CSR).

JEL Codes: L14, L15, M37, M38.

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## **Introduction**

A wide literature has emerged, also in economics, that study the role of social capital in societies. This by now familiar (but still unsettled) concept to many social scientist is known to be broadly correlated with variables such as per-capita income (e.g. Paldam, 2000). Hence, a crucial question is in understanding what are the origins of social capital, so that policy actions can be taken in order to raise welfare. One variable that is commonly considered to proxy social capital is a measure of trust. As the argument goes, a higher level of trust in a society should be a proxy for a higher social capital.

There is ample evidence, however, that trust is a difficult concept to measure, and even more difficult to explain. As for measurement issues, researchers usually rely on survey data, but there are formidable difficulties in assessing the meaning of these questionnaire based interviews. Data from the World Values Survey are the most commonly used, and shows striking differences across world countries in the share of people that state most fellows in a society can be trusted. For instance, taking the 2000 wave of the WVS, the most “trustworthy” societies appear to be Sweden and Denmark, but also Iran, with more than 65% people trusting others; at the opposite extreme, one can find Tanzania and Uganda, with less than 10%. How can we interpret these data? What does exactly mean “trusting others”? Regression analysis e.g. by Paldam (2007) suggests a correlation between trust and a measure of income distribution, life satisfaction, and corruption, all variables strongly correlated with per capita income. Berggren and Jordahl (2005) add to these variables an index of economic freedom, but also religious fractionalization and the presence of a hierarchical religion (like Catholicism, Christian Ortodox, or Islam). All these studies however fail to account for a convincing theoretical explanation of the link between these variables and trust, so that empirical findings are to be thought as mere correlations more than causal linkages. One problem is the measure of trust itself, which is plagued with measurement errors (again Paldam, 2007). The point is that trust in others can be declined with several different meanings. For instance one can think to others acting in very different institutions, from priests in religious organisations to politicians in government or parliament, from managers in very large companies to physicians in public hospitals. According to available data, a survey across 46 countries, there are striking differences in trust across different institutions, with large corporations and parliament scoring at the lowest rank (World Economic Forum quoted in Banez and Decena, 2005). But there is also variability across countries in assessing trust in institutions: government and media are

much trusted in China, whereas they score last in Europe; on the contrary Chinese do not trust businesses very much, contrary to Brazil, Canada, and U.S. (Edelman Annual Trust Barometer quoted in Banez and Decena, 2005). Of course, these variability across institutions and countries renders the measure of trust very sensitive to scandals discovered in different settings, and this – in turn - should make readers rather sceptical about the meaning of cross-country studies based on point estimates of the general level of trust.

One way to overcome the problem of comparing different countries is to consider a more narrow definition of trust. As far as the economic development is concerned, an important dimension of trust is *trust in trading relationships*. On the one hand, buyers need to trust sellers about the quality, safety, and shipping of products; on the other hand, sellers need to trust buyers that they will pay the products purchased, by honouring their promises. From an historical perspective, this peculiar definition of trust bring us to the origin of modern market economies. Before the industrial revolution took place, and specialisation in production was pursued, household production did not pose any problem of “generalised” trust (i.e. of trust involving potentially all the people one may trade with), simply because market exchanges were limited to professional traders, embedded in network relationships in which reputation played a crucial role. On the contrary, the drop in household production and the emergence of market exchanges took the problem of trust at the forefront of a well-working society. How did trust emerge?

In this paper we argue that the emergence of trust was favoured by competition in product markets, which allowed consumers to punish dishonest producers by changing trading partners. However, as economies moved to more concentrated industries and mass production, the competitive mechanism has been proved insufficient to foster trust, so that other mechanisms needed to be adopted, like public regulation and investments in brand names. These institutions needed to be rethought in the successive era, in which ownership and control were separated, and large multinational corporations appeared. We argue that the recent focus on Corporate Social Responsibility (CSR) and self-regulation by firms is a sign of this process.

The remainder of the paper is structured as follows. In Section 1 we outline a model of a local trade economy, and define a trustworthy economy, in order to interpret the role of competition in early market development. We define a “trustworthy economy” as an economy in which sellers always deliver high-quality commodities, and buyers trust sellers always to deliver the high quality type of commodity. We show under what

circumstances competition is a sufficient condition for a trustworthy economy to come about. A discussion is also provided to support the argument that in highly complex economies, competition alone cannot support a trustworthy equilibrium. In Section 2 we discuss the passage to more concentrated industries, while in Section 3 we consider the problem of the separation of ownership from control and discuss the role that this separation opens to CSR. Conclusions follow.

## **1. A simple model of a local trade economy**

Recent experimental studies (Bolton et al., 2007; Huck et al., 2007) argue that competition yields higher levels of buyer trust and seller trustworthiness, with this having obvious desirable consequences on market efficiency. The setting analysed in these studies basically resembles the classical trust game, with the first mover (the buyer) deciding whether to purchase an item, and the second mover (the seller) deciding whether to cheat (by providing a good of a quality different from the one promised or by not shipping the good). The efficient outcome is supposed to be the one in which the buyer trusts the seller and this in turn repays trust with trustworthiness. Both studies compare a no competition treatment, where the buyer is constrained to play the game with a seller randomly matched with her, with a competition treatment, where the buyer has the option of choosing among different sellers on the basis of their reputation, represented by the list of actions made in previous periods. Experimental evidence then suggests that introducing competition (to be meant as the presence of different sellers among which the buyer can choose) together with some information about sellers' past choices, enhances market efficiency, given that sellers who behave dishonestly can be traced and punished (buyers can avoid to deal with them in the future), with this creating strong incentives for sellers to be trustworthy (and for buyers to trust).

The argument that competition fosters trustworthiness dates back to Adam Smith (1763 [1978]) whose insights in the formal game theory terminology were first developed by Tullock (1985). As Smith (1763 [1978]) points out in his *Lectures on Jurisprudence*:

Whenever commerce is introduced into any country probity and punctuality always accompany it. These virtues in a rude and barbarous society are almost unknown. Of the nations of Europe, the Dutch, the most commercial, are the most faithful to their word. The English are more so than the Scotch, but much inferior to the Dutch, and in some remote parts of this country they are far less so than in the more commercial parts of it. This is not at all to be imputed to national character, as some pretend .... It is far more reducible to

selfinterest, that general principle which regulates the actions of every man, and which leads men to act in a certain manner from views of advantage, and is as deeply implanted in an Englishman as a Dutchman. A dealer is afraid of losing his character, and is scrupulous in performing every engagement. When a person makes perhaps 20 contracts in a day, he cannot gain so much by endeavouring to impose on his neighbours, as the very appearance of a cheat would make him lose. Where people seldom deal with one another, we find that they are somewhat disposed to cheat, because they can gain more by a smart trick than they can lose by the injury which it does their character.

Grounding on this argument, in this section we sketch a simple model to show how competition can foster trustworthiness in cases in which, as in Klein and Leffler (1981), buyers have the chance of choosing the set of sellers they are willing to transact with, updating this set on the basis of their past experience. Klein and Leffler show that there exists a price premium that, given the discount factor, leads firms to behave honestly, and that this price premium lowers along with concern for future transactions. In our paper we directly emphasize the time horizon of sellers as the key variable and highlight the dynamics which can possibly lead to what we call a *trustworthy equilibrium*. The model also aims at making clear the assumptions (often implicit), which have to be made to support the view that competition enhances trustworthiness and trust; this will serve as the basis for a critical discussion of the view. As it will become clear later when discussing the issue from an historical point of view, competition can be considered as fostering trust in the early stages of economic development, but not later on, when technological changes both favoured a geographical concentration of production (see Krugman (1991), for a discussion concerning U.S.) and made product quality difficult to assess even after consumption (think for example at the long-run effects on health of drugs, food or even clothing). As we shall argue, technological changes make competition neither a necessary nor a sufficient condition for trustworthiness.

### 1.1. The baseline framework

We consider a very simple exchange economy, with a finite set of buyers  $B = \{b_1, \dots, b_N\}$ ,  $\#B = N$ , and a finite set of sellers  $S = \{s_1, \dots, s_M\}$ ,  $\#S = M$ , with  $N > M$ . At the beginning of each period  $t = 0, \dots$ , every buyer ( $b^i$ ), chooses a subset  $\Theta_t^{b^i} \in \wp(S)$  of sellers ( $s^j$ ), where  $\wp(S)$  is the power set of  $S$ , with which she is willing to transact; then she is randomly matched, with equal probability, with one of the sellers belonging to  $\Theta_t^{b^i}$ . We will refer to  $\Theta_t^{b^i}$  as the *matching set* of buyer  $b^i$  at time  $t$ .

The probability that at time  $t$ ,  $b^i$  is matched with a given  $s^j \in \Theta_t^{b^i}$ , is therefore

$$Pr\{\mu(b^i, t) = s^j \in \Theta_t^{b^i}\} = (1/\#\Theta_t^{b^i}),$$

where  $\mu$  is the matching function. We suppose that  $\Theta_0^{b^i} = S$ ,  $\forall i$ .

To simplify matters we assume that there exists only one commodity in the economy ( $q$ ); this assumption is not crucial for the results to follow. Commodity  $q$  can be either of low ( $L$ ) or high ( $H$ ) quality. Quality is not observable by buyers before consuming  $q$ , and this opens the room to opportunistic behaviour by sellers<sup>1</sup>. These can deliver a quality lower than the one expected at the ongoing market price, exploiting buyers<sup>2</sup>.

At each period of time  $t$ , any buyer  $b^i$  purchases one unit of commodity from the seller  $s^j$  she is matched with, paying a price  $p_t(M_t)$ , which is decreasing in the number  $M_t$  of sellers which are active at time  $t$ , with  $M_t \leq \#S$ . A seller  $s^j$  is active if there exists a  $b^i$  such that  $s^j \in \Theta_t^{b^i}$ , that is if the seller belongs to at least one's buyer matching set (i.e. there exists at least one consumer willing to trade with it). The buyer then consumes the commodity and finds out its quality<sup>3</sup>. If the good is revealed to be of low quality, from the next period on,  $s^j \notin \Theta_t^{b^i}$ , therefore, from the next period on  $s^j$  does not belong to the set of sellers  $b^i$  is willing to be matched with (which becomes the largest set not including  $s^j$ ).

Sellers decide the quality of the commodity they want to provide. We suppose that at any  $t = m$ , each seller  $s^j$  chooses an action  $a_m^j \in \{H, L\}$

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<sup>1</sup> For instance, one can think to commodity  $q$  as a cake. In a simple local economy, consumers know where the flour, the eggs, and the butter come from, so that the quality relies on the work by the baker and the quality of ingredients she can decide to use. Notice that – in the early stage of economic development – the absence of any chemical preservatives made the detection of quality *after* consumption easy for consumers. In this sense, our commodity  $q$  can be thought as an “experience good” in the sense of Nelson (1970). For a discussion on this point see below, Sec. 2.1.

<sup>2</sup> Shapiro (1983) considers a set of heterogeneous buyers, each of them having a different taste for quality. In equilibrium, each buyer may get the desirable quality level (provided that this is higher than the minimum enforced quality standard) paying a premium (given by the difference between the price paid and the cost of production) which is increasing in the quality level. In our model we assume that all consumers have the same preferences and only prefer the good of the highest quality.

<sup>3</sup> We relax this assumption later in the paper. Indeed, one can think of certain goods or services for which consumers are not able to assess quality even after consumption takes place.

knowing the history  $\Omega(m) = (\omega_t)_{t=0}^{m-1}$  of the game, where  $\omega_t = (a_t^j)_{j=1}^{M_t}$  is the action profile at  $t = 0, \dots, m - 1$ .

If at  $t = m$ , a seller  $s^j$  decides to sell a commodity of quality  $v = (H, L)$ , its expected payoff at that time is given by:

$$\pi_m^j = E^j(b | \Omega(m))(p_t(M_t) - c(q^v)) \quad (1)$$

where  $E^j(b | \Omega(m))$  is the expected number of buyers faced at  $t = m$  by a seller  $s^j$  given  $\Omega(m)$ ,  $c(q^v)$  is the average variable cost of providing one unit of commodity of quality  $v$ , and  $p_t(\#S) > c(q^H) > c(q^L)$ <sup>4</sup>. Throughout the paper we assume that  $c(q^v)$  is constant, that is, it does not depend on the number of buyers being served by the firm.

A seller  $s^j$ 's payoff is the discounted sum of its stage payoffs:

$$\pi_j = \sum_t E^j(b | \Omega(t))(p_t(M_t) - c(q^v))(\delta^j)^t \quad (2)$$

where  $\delta^j$  is a draw from a random variable distributed according to some  $f(\cdot)$  with supports  $[\theta_1, \theta_2]$ , with  $0 \leq \theta_1 < \theta_2 \leq 1$ . This latter assumption catches the fact that sellers do not discount the future at the same rate. In other words, they can be distinguished on the length of their time horizon. Therefore, in our model buyers are homogeneous but sellers are heterogeneous.

A strategy for seller  $s^j$  is simply a function  $\gamma^j : \Omega(t) \rightarrow a_t^j \in \{H, L\}$ . A seller  $s^j$ 's best strategy, is a strategy  $\gamma^{j*}$  that maximizes its payoff given

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<sup>4</sup> The number of buyers each seller faces will possibly vary over time. In fact, suppose that at time  $t = m - 1$  all the sellers but  $s^k$  supply an high quality commodity, and that no seller has delivered  $q^L$  before. The expected number of buyers matched with  $s^k$  at time  $t = m - 1$  is therefore  $E^k(b | \Omega(m - 1)) = N/M$ . If  $s^k$  cheats, at time  $t = m$  it will face a number of buyers equal to:

$$E^k(b | \Omega(m)) = \frac{N - (N/M)}{M}$$

because those buyers who got the commodity from it at time  $t = m - 1$  will no longer want to trade with it. Note that this corresponds to an increase in the expected number of buyers matched with any other seller  $s^j \neq s^k$  at time  $t = m$ . In fact, suppose that all the sellers supply an high quality commodity up to time  $m - 1$ , and that at this time, only seller  $s^k$  supplies a low quality commodity. At time  $t = m$ , the expected number of buyers matched with any seller  $s^j \neq s^k$  is therefore given by:

$$E^j(b | \Omega(m)) = \frac{(N - (N/M))}{M} + \frac{(N/M)}{M - 1} > N/M.$$

In more general terms it is straightforward to realize that for any trustworthy seller  $s^j$ , the expected number of buyers is non-decreasing in time,  $E^j(b | \Omega(m)) \geq E^j(b | \Omega(m - 1))$ , with this latter expression holding with equality only when all the sellers are trustworthy.

the strategies  $\gamma^{-j}$  of the other sellers. A set of strategies  $(\gamma^*)_{j=1}^{M_t} \equiv (\gamma^{-j^*}, \gamma^{j^*})$  is an equilibrium if each seller plays its best strategy.

It should be clear that under the assumptions of the model, the expected number of buyers matched with a seller is non-decreasing over time as long as it supplies high quality commodities (it is increasing as long as at least one seller supplying low quality commodities does exist). Henceforth, as  $E^j(b|\Omega(t))$  is non-decreasing over time as far as at each  $t$ ,  $\gamma^j(\cdot) = H$ , whereas it is non-increasing over time as far as at each  $t$ ,  $\gamma^j(\cdot) = L$ , in non-discounted terms the profits every trustworthy seller makes at every stage  $t$  are non-decreasing, and the profits of sellers supplying low quality commodities are non-increasing.

**Equilibria.** As any repeated game, also the present one endows the agents with an infinite number of strategies. Being interested in studying whether competition fosters trustworthiness we propose the following:

**Definition.**  $(\gamma^{j^*})_{j=1}^{M_t}$  is an equilibrium if, for each  $j$ ,  $\pi_j(\gamma^{-j^*}, \gamma^{j^*}) > \pi_j(\gamma^{-j^*}, \gamma^j)$ . It is a trustworthy equilibrium if, for each  $j$ ,  $\gamma^{j^*}(\Omega(t)) = H$  for each  $t$ .

A set of strategies constitute a trustworthy equilibrium if, given the strategies of the others, each player plays its profit maximizing strategy  $(\gamma^{j^*})$ , which requires it to play  $H$  at each stage of the game.

**Lemma 1.** Suppose that  $(\gamma^{-j}, \gamma^j)$  are the strategies being played, then  $\exists \delta^{j^*} \in (0,1)$ , such that, if  $\delta^j > \delta^{j^*}$ ,  $\gamma^j$  cannot be optimal if it requires  $s^j$  to play  $L$  at some  $t$ .

**Proof.** Given  $\gamma^{-j}$ , a seller's  $s^j$ 's optimal strategy requires it to play  $L$  either never or a finite number of times  $z > 0$ . First consider the case in which  $\gamma^{-j}$  require to play  $H$  at each  $t$ , and suppose that, according with  $\gamma^j$ ,  $s^j$  has already played  $L$  a number  $z-1$  of times, with  $\gamma^j$  requiring it to play  $L$  again at  $t = m \geq z - 1$ . If  $s^j$  behaves accordingly, for any buyer cheated it gets  $[(p(S) - c(q^H)) + (c(q^H) - c(q^L))](\delta^j)^m$ . Yet it would be possible for  $s^j$  to play an alternative strategy,  $\gamma^{j'}$ , which differs from  $\gamma^j$  only in the behaviour it requires from  $t = m$  on, that is  $\gamma^{j'}(\cdot)_{t=m}^\infty = H$ . Adopting  $\gamma^{j'}$ , a buyer not cheated at  $t = m$  will be willing to keep on trading in subsequent periods, ensuring to  $s^j$  a payoff of

$$\frac{\sigma(p(S) - c(q^H))}{1 - \delta^j} (\delta^j)^{m+1},$$

where  $\sigma = (1/S)$  is the probability of being matched at  $t > m$  with one of those buyers that  $s^j$  could have cheated at  $t = m$  and did not. For player  $s^j$  not to play  $L$  at  $t = m$  it is therefore required that

$$\frac{\sigma(p(S) - c(q^H))}{1 - \delta^j} (\delta^j)^{m+1} > (c(q^H) - c(q^L)) (\delta^j)^m$$

or

$$\sigma(p(S) - c(q^H))g(\delta^j) > (c(q^H) - c(q^L)) \quad (3),$$

where  $g(\delta^j) = (\delta^j / (1 - \delta^j))$  is continuous and increasing in  $\delta^j$ , with  $\lim_{\delta^j \rightarrow 1} g(\delta^j) = \infty$ . If  $\delta^j$  is sufficiently high, i.e. above a certain threshold  $\delta_z$ , playing  $L$  at  $t = m \geq z - 1$  cannot be optimal, therefore the optimal strategy cannot imply to play  $L$  a number  $z$  of times. Suppose therefore that  $\gamma^j$  requires  $s^j$  to play  $L$  a number  $z-1$  of times. With identical reasoning it is possible to show that if  $\delta^j > \delta_{z-1} = \delta_z$ , (3) holds; then  $\gamma^j$  cannot be optimal. The reasoning applies to any number of times  $\gamma^j$  requires  $s^j$  to play  $L$ . We can therefore conclude that  $\exists \delta^{j*} = \delta_z = \delta_{z-1} = \dots = \delta_0 : \forall \delta^j > \delta^{j*}$  if  $\gamma^j(\Omega(m)) = L$  at some  $t$ , then  $\gamma^j \neq \gamma^{j*}$ : the optimal strategy can never imply to play  $L$ . Suppose now that  $\gamma^{-j}$  is a profile of arbitrary strategies. This implies, everything equal, that  $\sigma'$ , the probability of being matched in subsequent periods with one of those buyers  $s^j$  could have cheated at a certain  $t$ , is not smaller than in the previous case,  $\sigma' \geq \sigma$ , because the average number of sellers belonging to the matching sets of those buyers matched with  $s^j$  at  $t$  cannot be greater than  $S$ ; by the same token, the price paid for the good, at each  $t$ , is not smaller,  $p(M_t) \geq p(S)$ . Therefore the conclusion that  $\exists \delta^{j*} \in (0,1)$ , such that, if  $\delta^j > \delta^{j*}$ ,  $\gamma^j$  cannot be optimal if it requires  $s^j$  to play  $L$  at some  $t$ , applies. ■

By the previous lemma, the way through which the strategies of the other players affect player  $s^j$ 's behaviour is both through the probability of future interaction of seller  $s^j$  with those buyers it decides not to cheat, and through the market price. Notice that the expected gains from future

interaction are smaller when the number of trustworthy players is higher. Hence, *for a given discount factor and for a given choice of all the other producers*, it is more likely that a player is trustworthy when the others are not than when the others are trustworthy.

In the following proposition we emphasize the conditions for a trustworthy equilibrium to come about.

**Proposition 1.** For  $(\gamma^{j*})_{j=1}^{M_t}$  to be a trustworthy equilibrium there must be a  $\delta^* < \theta_2$  such that  $\delta^j > \delta^*$  for any active  $j$ .

*Proof.* According with the definition given above, for  $(\gamma^{j*})_{j=1}^{M_t}$  to be a trustworthy equilibrium each seller has to play  $H$  at each  $t$ . Since players are equal in all but the way they discount the future, by lemma 1 it is possible to find a value of  $\delta$ , call it  $\delta^*$ , such that if  $\delta^j > \delta^*$  for any  $s^j$ , the optimal strategies never imply to play  $L$ . Hence, for a trustworthy equilibrium to come about,  $\delta^*$  must lie within or below the interval  $[\theta_1, \theta_2]$  on which  $\delta$  is distributed. ■

In proposition 1 we have highlighted the conditions for a trustworthy equilibrium to come about. However, the probability that a trustworthy equilibrium is established from time  $t = 0$ , may be very low. Though, the dynamic mechanism outlined above may induce that from a certain time  $t=m$  on, only sellers which provide high quality commodities are active.

## 2. Discussion and Extension

### 2.1. *The historical interpretation*

What kind of economic environment is able to describe the simple exchange economy we modelled in the previous section? We believe the question is crucial, and less simple than it appears at first glance. If we think at today's markets, we should recognise that a model as such is unable to describe reality. Take the commodity  $q$ , that we interpreted before as a cake: even for very simple goods such a cake, the hypothesis of quality unknown since consumption takes place is not tenable in today's economies<sup>5</sup>. What the consumers can find out – at least in some cases - after eating the cake is

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<sup>5</sup> Notice that problems are even more severe for credence goods. Market institutions that have developed to face problems with credence goods are discussed e.g. in Dulleck and Kerschbamer (2006).

whether or not the consumption caused a bellyache. But they do not know, for instance, whether the flour is obtained from genetically modified grains, whether preservatives different from those indicated on the package have been used, whether the cake has been correctly conserved, and so on. The costs to find answers to these questions are huge, and in some cases answers are even impossible to obtain. Why then we trust producers and buy such difficult-to-evaluate goods? The answer seems to be: because a plethora of different institutions (directly originated from the markets itself or originated from public intervention) addressed the problem. We will tackle these issues in what follows, to sustain the argument that competition per se is incapable of resolving the problem of trust today. In this section we interpret historically the model described above.

According to most historians (e.g., Chandler, 1977), at the end of XVIII century the economies were dominated by all-purpose merchants. These individuals supply inputs to local manufacturer (generally speaking, small artisans) and sell goods to other merchants located in distant cities. These figures are close in nature to microeconomic-textbook suppliers, that write short-term contracts to hire inputs required for production. Notice that *the greatest share of trading was made up of local exchanges*. In other words, consumers and suppliers know each other; and the mechanism described in our model can explain the emergence of a trustworthy economy in this framework: all one needs is that there exist producers who discount the future at a sufficiently high rate.

Clearly enough, not all inputs were produced and traded in a narrow local area. Also for these exchanges – though the minority of the economic activity – one need to explain how trust evolved. The mechanism in this case was *direct control* through a representative of the family or a reliable captain of the ship involved in transportation (Chandler, 1977). Indeed, all-purpose merchants were responsible also of financing local economic activities and of transporting and distributing goods.

## 2.2. Information Transmission

In the previous section we supposed that each buyer gets the commodity from a seller and can avoid to further buy from her if the seller cheats. Doing this, we have implicitly assumed that there is no information transmission among agents (or that the information transmitted is not considered reliable). After having experienced a bad outcome a buyer simply eliminates that particular seller from the set of sellers it is willing to trade with and this does not have any other effect on the reputation of that seller. In fact each buyer is willing to trade with any seller who has never

cheated her before, paying no attention at whether she cheated anyone else in previous periods. If the number of sellers is high and therefore any of them serves in each period only a small fraction of the buyers, untrustworthy sellers are made inactive in an extremely slow way, with the consequence that for a trustworthy equilibrium to come about very forward-looking sellers are required.

The hypothesis of no information transmission among buyers is however an extreme one. Markets are in fact embedded in social networks, and networks are nothing but a means to allow information transmission. This was especially true in the case of early market development, when living in small communities made information transmission about ordinary goods very effective<sup>6</sup>.

The crucial question is how much information travels among individuals participating in the network and what is its degree of reliability. At one extreme there is the case emphasized in the previous paragraph in which no information about sellers' past behaviour is made public. At the other extreme the case in which all information about sellers' past behaviour is without cost made available to all the buyers (as in Klein and Leffler (1981) and Shapiro (1983)). In terms of the notation previously used, in this latter case we have that each buyer *matching set* is given by the intersection of the *matching sets* of all the buyers,  $\bigcap_{i=1}^N \Theta_i^{b^i}$ . In other words all the buyers share the available information about sellers' past behaviour. Clearly the punishment for cheating is in this case much more effective, and, everything constant, the value of  $\delta^*$  which ensures that a trustworthy equilibrium takes place is much smaller than before<sup>7</sup>. Apart from these two extreme cases, there is the more likely case in which a given buyer share its available information only with a subset  $B' \subset B$  of buyers. Again, all this has

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<sup>6</sup> The usual assumption however is that if a particular buyer has been cheated by a seller at time  $t = m - 1$ , all the other buyers who this fact come to be known to, are willing to cancel it from their matching sets. One could however wonder why the fact that a seller has cheated buyer  $b^i$  should induce  $b^k$  to believe that it will be cheated from it in subsequent periods.

<sup>7</sup> To make ideas clear, let us suppose that in equilibrium  $\gamma^{j*}$  requires  $s^j$  to play  $L$  always whereas an alternative strategy  $\gamma^{j'}$  requires  $s^j$  to play  $H$  always. This means that, being the optimal strategy,  $\gamma^{j*}$  must ensure to  $s^j$  a payoff at least as high as  $\gamma^{j'}$ :

$$\sum_{t=0}^{\infty} E^j(b | \gamma^{-j*}, \gamma^{j*})(p(M_t) - c(q^L))(\delta^j)^t \geq \sum_{t=0}^{\infty} E^j(b | \gamma^{j*}, \gamma^{j'})(p(M_t) - c(q^H))(\delta^j)^t$$

If information is public, we have that the payoff of  $s^j$  under  $\gamma^{j*}$ , reduces to

$$E^j(b | \gamma^{-j*}, \gamma^{j*})(p(M_t) - c(q^L))(\delta^j)^0 = N/M(p(M_t) - c(q^L)),$$

because from  $t = 1$  on  $s^j$  is made inactive.

effect on the speed with which sellers providing low quality commodities are punished, and therefore on the probability that a trustworthy equilibrium emerges.

The result in Proposition 1 then suggests that under some conditions each seller will always deliver the high quality good, because it is in her best interest to do so. Hence, buyers will trust sellers to always deliver  $q^H$ .

But: is it competition in itself which favours the emergence of a trustworthy equilibrium? In which sense does competition actually fuel trustworthiness? In our model, a trustworthy equilibrium comes about only when a subset of sellers are sufficiently forward-looking<sup>8</sup>.

Under the emphasized conditions, competition would not be sufficient to ensure trustworthiness. Suppose in fact that buyers do not have exit options. If there is only one seller, knowing that buyers do not have any chance except buying from it, it would have a very powerful incentive to cheat. However, if in the market there is a new entrant who behaves trustworthily, the first seller would lose buyers. This seems very obvious. The point however is: why should the new entrant have an incentive to behave trustworthily? The answer is: because it is forward looking. Therefore: competition fosters trustworthiness if conditions are given such that more sellers means a higher probability that a subset of them has an incentive to behave trustworthily, that is, has an incentive to build a reputation for trustworthiness.

### 2.3 Free entry with positive profits

In the previous section we have assumed that the ongoing market price for high quality goods is higher than cost. This implies the existence of profits higher than normal in equilibrium. The presence of such profits is possible because we have assumed no free entry. However, as long as profits are positive, if entry is allowed, new sellers may join the market<sup>9</sup>.

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<sup>8</sup> To see why, let us suppose that given the discount factor of each player, the equilibrium strategies require any seller to play  $L$  at each stage of the game. It would be possible to compute a value of  $\delta$ , call it  $\delta^*$ , such that if a player had a discount factor greater than  $\delta^*$  would have an incentive to change its strategy. However, suppose that  $f(\cdot)$  is such that  $pr\{\delta > \delta^*\} = 0$ . This implies that also new entrants in the game would play  $L$  at each stage of the game.

<sup>9</sup> As it has been emphasized in the literature, however, the long-run competitive equilibrium cannot imply  $p_t = c(q^H) > c(q^L)$ . In fact, in this case, no seller would have incentives to provide the high quality good. Consumers will rationally anticipate this and would prefer not to buy the good (if they have the chance of doing so). Hence the existence of asymmetric information about the true quality of the good being sold, prevents the price to

Klein and Leffler (1981) suggest several mechanism that firms may adopt to dissipate profits (advertisements, for example). Shapiro (1983) supposes that to acquire reputation firms have to face an initial cost (they sell the good at a price lower than cost) which can be recovered in the future (initial cost equals the value of future profits). It is interesting to note that Shapiro (1983) explicitly assumes that the initial cost does not constitute a barrier to entry for other firms. Indeed, the point raised by Klein and Leffler for example, is that firms may dissipate profits by making expenditures which signal high price premiums and therefore a convenience for honesty. However we suggest that if building a reputation for honesty requires an initial investment, this could constitute a barrier to entry in the market.

To make things simple, we expose the argument here quite informally. Consider the set of sellers  $S = \{s_1, \dots, s_M\}$ , and suppose that each of them, to be recognized as an honest seller, has to make an investment in brand name equal to  $F$ . Suppose that buyers are willing to be matched only with those sellers which make such an investment.

Let us suppose that at  $t = 0$ , only  $s$  trustworthy sellers, those with the highest value of  $\delta$ , are active, and that  $p(s) > c(q^H)$ . Suppose that the number of active sellers,  $s$ , is such that all of them keep on providing the high quality good even after the entrance of another seller.

$$\delta^1 < \dots < \delta^k < \underbrace{\delta^l < \dots < \delta^M}_{s \text{ active firms}}$$

If the active firms make an investment sufficiently high, then no other firm will enter the market. To prove this, let  $\delta^*(s)$  be the value of  $\delta$  over which firms have an incentive to supply high quality goods; by hypothesis  $\delta^j > \delta^*(s)$ ,  $j = l, \dots, M$ . Consider a potential entrant  $k$  such that  $\delta^k \leq \delta^*(s)$ . It must be that  $\pi^j - \pi^k = F^j > 0$ <sup>10</sup>. Suppose therefore that each active firm at  $t =$

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be the one which gets established in competitive markets where information is perfect. The existence of a price premium is a necessary condition for firms to provide high quality good.

<sup>10</sup> To prove this, take a seller  $j$  and note that if  $j$  mimics  $k$  by providing the low quality good, its profit must be lower (otherwise it would not keep on providing the high quality good after  $k$ 's entry), therefore

$$\pi^{jk} = \sum_t E^j(b | \Omega(t))_t (p_t(M_t) - c(q^L)) (\delta^j)^t <$$

0 makes an investment  $F = \pi^{k*}$ , where  $\pi^{k*}$  would be the profit of a firm with discount factor equal to  $\delta^*(s)$  if it entered the market. Cheaters do not enter the market. However, since profits are positive, other firms with a discount factor greater  $\delta^*(s)$  could enter the market. Consider among the  $s$  active firms, the one which has the lowest discount factor,  $\delta^l$ . If  $F$  is raised such that it equals the positive profits of such firm, the other  $s - 1$  are making positive profits and no other firm, with a discount factor smaller than  $\delta^l$  can enter the market.

We are explicitly referring to *Green Beard* models (Fehr and Fischbacher, 2005; Frank, 1988, 2005; Jansen and van Baalen, 2006; Nowak, 2006; Sobel, 2005; Sugden, 2004). Green Beard models are grounded on the assumption that some agents are labelled with a generally recognizable and publicly visible signal which carries valuable information about their willingness to cooperate with others. Much discussion has been made about the validity of such models. What is generally held to be as the most prominent shortcoming is that opportunists may mimic the signal gaining an advantage. There are however examples (especially in biology) showing that in many cases imitating the signal is too costly for opportunists. It seems to us that historically, honest firms have invested much of their resources to try to get this publicly visible signal (a green beard, but in our context it would be better to talk of a green brand!). This is what firms try to get from advertising, CSR and so on. The main point is that trying to get a green beard must be prohibitively costly for firms which try to imitate.

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$$\pi^j = \sum_t E^j(b | \Omega(t))_t (p_t(M_t) - c(q^H)) (\delta^j)^t \quad (4)$$

where  $\pi^j$  is the profit of firm  $j$  when providing the high quality good and  $\pi^{jk}$  is its profit when it mimics  $k$  by providing the low quality good. Further note that also the following holds

$$\begin{aligned} \pi^k &= \sum_t E^k(b | \Omega(t))_t (p_t(M_t) - c(q^L)) (\delta^k)^t \\ &< \\ \pi^{jk} &= \sum_t E^j(b | \Omega(t))_t (p_t(M_t) - c(q^L)) (\delta^j)^t \end{aligned} \quad (5)$$

in fact the above expressions are equal except for the discount factor, and  $\delta^j > \delta^k$ . Taken together, (4) and (5) imply  $\pi^k < \pi^{jk} < \pi^j$ , that is  $\pi^j > \pi^k$ .

## **2. From a *local trade economy* to *family capitalism*: the separation of consumers from producers**

We assumed so far that quality is not observable by buyers before actually consuming  $q$ , but after consumption takes place consumers are *always* able to recognise whether  $q$  was of high or low quality. While this can be a good approximation of real world in small communities at the early stage of industrialisation, it can be a difficult hypothesis to sustain when production processes take place far away from where consumers live, and are in the hands of people that consumers do not know.

Economic historians share the view that two driving forces changed the economies at the end of XIX century (Chandler, 1977; Holtfreter et al., 2006): on the one hand, technological advancements in producing goods increased the minimum efficient scale, i.e. they made economically inefficient small scale local producers; on the other hand, technological advancements in the flow of information and in the transportation of goods lowered the costs of separating “consumers from producers” (in this sense, also Coase, 1937, p. 397). These two forces caused an increased in the size of firms and a concentration of supply (hence a reduction in the number of producers, so that now consumers have less options than before). They also caused a development of a new organization, namely the corporation, the ownership of which can be easily traded and transferred. Corporation substituted the partnership, i.e. an organisation with unlimited liability, generally linked to a family.

Historical examples of these processes being at work are provided e.g. by Kim (2001) for U.S. in the case of food producers. Take for instance meat packing: local communities were used to have their local butchers, who they knew, but once capitalist economy started entering into a phase of strong specialisation in the late XIX century, and refrigerated cars were introduced, packing was concentrated in Midwest, because of the considerable comparative advantages in the production of meat. An immediate consequence of this concentration was the increase in the size of butchers, and the inability for consumers to assess the quality of products they were purchasing: was refrigerated meat butchered under horrible conditions? Was it detrimental to consumers’ health? This asymmetric information problem was even more true for other kind of foods, for which chemistry allowed the substitution of ingredients without acknowledging to consumers (e.g., adding new preservatives), but also for other manufactured products (drugs and medicines) and certain types of services (e.g., banking services).

What kind of consequences does the asymmetric information problem just outlined produce in terms of our model? Is competition enough to solve the problem of trust? If consumers are not able to assess quality after actually consuming  $q$ , then *they are not able by definition to punish dishonest sellers*, since they are simply not able to recognise them. Competition then (i.e., the presence of outside options for consumers) is a broken mechanism for creating trust, and Proposition 1 no longer holds. How then these societies solved the problems related to trust? How did they “produce” and sustain trust?

As suggested by e.g. Holtfreter et al. (2006), other “institutions” emerged in this period to protect consumers. Some were public institutions, some others were institutions directly originated from the market itself. *What is crucial here to remark is that markets as described in microeconomic textbooks no longer existed.* A first institution created to produce trust was surely *public regulation*, broadly defined to include antitrust regulation and products regulation. Sherman Antitrust Act dates back to 1890. U.S. Federal Government passed also the Meat Inspection Act (1891), the Food and Drug Act (1906), and other laws on product quality such as the 1938 Food, Drug, and Cosmetic Act (Kim, 2001; Holtfreter et al., 2006). These laws were intended at “levelling the playing field”, leaving all producers *undistinguishable* by buyers. In other words, *if government agencies were effective at enforcing the law*, consumers know that quality levels should have been at least as high as those defined by the law. In terms of our model, this means for instance that a regulation was introduced such that quality of  $q$  must be  $q^{H11}$ . Notice that the crucial task assigned to government agencies (and not-for-profit consumers organizations, that were created in the same period) was to discover potential violations of laws and regulations. Hence, it should not be surprising that trust in a particular producer (and consequently on similar producers) would have been lowered each time it was discovered to breach the law.

Beside public regulation, a market based institution developed to solve the problem of trust creation is *advertising* and the *development of brand names*, i.e. the investment by producers in a firm-specific and non-recoverable asset. Indeed, according to scholars, advertising flourished starting from 1880s: Pope (2008) estimates that total advertising volume in the U.S. grew from about \$200 million in 1880 to nearly \$3 billion in 1920. Kim (2001) argues that multiunit firms were the organizational form best

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<sup>11</sup> Take again the case of the cake. A public regulation could for instance fix the quality of flour and eggs that a producer must use. Examples of this regulation are widespread also in modern economies.

suited to implement this investment strategy; this is not key for our argument. What is important here is that – as discussed before in Section 2.3 - advertising was used to signal to consumers that a particular seller was credibly committing to trading an high quality product. Why this signal was credible? Because it was costly, and this for at least two reasons. First, if the firm was discovered at producing a low quality good, trust was gone, and with trust also consumers, devaluating the firm-specific investment in the brand name. Second, firms were personally owned by families, so that a likely bankruptcy (after trust was depleted) was directly involving families' wealth. This is a striking difference with the third phase of development, to which now we turn.

### **3. From *family capitalism* to *financial capitalism*: the separation of ownership and control**

According to Chandler (1990), family (or personal) capitalism has been responsible for the preference of a short term against a long term view of firms' profits, and of small scale operations which jeopardized investments and modernization. This view implicitly suggests the need, after the first round of development in late XIX – early XX century, of a further increase in the scale of operations, again driven by a further technological development, both in producing goods and in managing information. Going beyond family capitalism implied further increasing the size of firms, and using debts (or other external funds) to finance large scale enterprises, building financial conglomerates and multinational corporations. This was (and still is, at least in some cases) the orthodox view also taught in the most prestigious business schools (e.g., Gallino, 2005).

The consequences of this process are important for the emergence of trust. First, a further increase in market concentration challenged the ability of Antitrust Authorities to brave firms, and – more importantly – the ability of other government agencies to control and dispute against large-scale multinational firms. These are more difficult to regulate, since they can shop around for less restrictive regulation. Moreover, it further reduced the number of producers with which to trade: by now, the same corporations own different brands of a given goods. Take again our cake: it is not difficult to find examples of multinationals producing different brands of cakes. Advancement in technology made also problems of asymmetric information even more severe. As for food, one striking example is now the inability by consumers to recognise the use of genetically modified products. How can a consumer find out that her cake is made by flour

obtained from genetically modified grains? It is not at all surprising that according to a survey conducted in different European countries, a limited share of people believe that items like burgers or canned tomatoes are very safe to eat, with British, Danes and Norwegians being the more trusting people (e.g., Poppe and Kjærnes, 2003).

The expansion of firms' size made also more important external finance, so that family are now less involved than in the past in their businesses. Not surprisingly, founders' heirs are also less involved in *directly* managing firms, delegating this authority to professional managers, especially from mid XX century onwards (e.g., Gordon, 2007). This situation is by now the familiar separation of ownership and control in large corporations (e.g., Fama and Jensen, 1983). The common wisdom on how to face potential opportunistic behaviour by professional managers is to provide adequate incentives, in order to align the objectives of owners with those of managers. This has been done however by inducing managers to maximise short term profitability: professional managers are more interested in profits now than tomorrow, which makes the emergence of corporate scandals more likely. In terms of our model, this has caused a huge variation in  $\delta$ ; hence, recalling Proposition 1, it is easy to understand that a trustworthy equilibrium is more difficult to arise.

Again, how to solve the problem of creating trust in this new and more challenging framework? Is competition enough? The answer is clearly no. Notice also that – given the fact that multinationals own different brands and families are less involved in firms - investments in brands and advertising are less important. Public regulations and laws are clearly still used. Very recent examples for the U.S. include the Sarbanes-Oxley Act or the Organizational Sentencing Guidelines (e.g., Hess, 2006). However, they are implemented more as a reaction to recent corporate scandals, and do not seem to offer a solution to creating trust: for instance, the estimated impact of Sentencing Guidelines seems to be negligible (e.g., Parker and Atkins, 1999).

What many scholars seem to suggest is to recur to self-regulation by firms. The recent move toward Business Ethics, Ethical Codes, and Corporate Social Responsibility (CSR) can be interpreted as the need to signal a good reputation *lacking the power of other mechanisms*. Needless to say, leaving the creation of trust on corporate responsibility is a powerless mechanism, compared with those available in other historical contexts. Because CSR can be just “cheap talk”. This is clearly striking, because it suggests that governments are nowadays unable to enforce the law and punish corporations that are responsible of frauds against consumers. Notice that the costs of adopting CSR by mimicking “ethical” firms are minimal for

enterprises that fraud consumers, because nothing but the penalties provided by the law is what really matters for them. Notice also that governments are unable to be effective because they lack resources to identify frauds or to prosecute corporations charged of frauds. A clear example is provided by the ineffectiveness of Food and Drug Administration in the U.S.:

The Food and Drug Administration has known for years about contamination problems at a Georgia peanut butter plant and on California spinach farms that led to disease outbreaks that killed three people, sickened hundreds, and forced one of the biggest product recalls in U.S. history, documents and interviews show. Overwhelmed by huge growth in the number of food processors and imports, however, the agency took only limited steps to address the problems *and relied on producers to police themselves*, according to agency documents.

[E. Williamson, *The Washington Post*, April 23, 2007; emphasis added]

Our interpretation of CSR as a self-regulation mechanism for creating trust being all the other instruments ineffective, is completely different from those already available in the literature: for instance, Besley and Ghatak (2006) view CSR as the creation of public goods or curtailment of public bads, but they need to assume that consumers are able to observe the “public good content” of a given product, which we argue is clearly untenable in today’s economies. If this was possible, then it was possible for consumers also to find out the quality of the goods supplied. Heal (2005) suggests that CSR plays a role in reducing externalised costs or in avoiding distributional conflicts, but fails to account what happens in case managers are irresponsible and breach “ethical codes”, and why they should not fraud consumers in case no penalties - except those provided by the law - are to be expected.

#### **4. Conclusions**

Experimental evidence suggests that introducing competition together with some information about sellers’ past choices, enhances market efficiency, given that sellers who behave dishonestly can be traced and punished with this creating strong incentives for sellers to be trustworthy (and for buyers to trust). In the first part of the paper we have sketched a model to highlight the circumstances under which competition can plausibly foster trustworthiness. Differently from previous theoretical contributions we directly emphasize the time horizon of sellers as the key variable and highlight the dynamics which can lead to what we call a *trustworthy*

*equilibrium*. The view that competition fosters trustworthiness has however been made under critical scrutiny in the second part of the paper. Here we argue that the emergence of trust was favoured by competition in product markets, which allowed consumers to punish dishonest producers by changing trading partners. However, as economies moved to more concentrated industries and mass production, the competitive mechanism has been proved insufficient to foster trust, so that other mechanisms needed to be adopted, like public regulation and investments in brand names. These institutions needed to be rethought in the successive era, in which ownership and control were separated, and large multinational corporations appeared. We argue that the recent focus on Corporate Social Responsibility (CSR) and self-regulation by firms is a sign of this process.

## References

- Banez R. G. and Decena J. S. (2005), Restoring trust in the workplace, mimeo.
- Ben Porath E. and Dekel E. (1992), Signaling Future Actions and the Potential for Sacrifice, *Journal of Economic Theory*, 57, 36-51.
- Bergen N. and Jordahl H. (2005), *Free to trust? Economic freedom and social capital*, Working Paper 2005:2, Department of Economics, Uppsala University.
- Besley T. and Ghatak M. (2006), Retailing Public Goods: The Economics of Corporate Social Responsibility, London School of Economics, mimeo.
- Bolton G. E., Loebbecke C., Ockenfels A. (2007), How social reputation networks interact with competition in anonymous online trading: An experimental study, mimeo.
- Chandler A. D. Jr. (1977), *The Visible Hand. The Managerial Revolution in American Business*, Cambridge (MA): The Belknap Press of Harvard University Press.
- Chandler A. D. Jr. (1990), *Scale and Scope*, Cambridge (MA): Harvard University Press.
- Coase R. H. (1937), The Nature of the Firm, *Economica*, IV (13-16), 386-405.
- Dulleck U. and Kerschbamer R. (2006), "On Doctors, Mechanics, and Computer Specialists: The Economics of Credence Goods", *Journal of Economic Literature*, XLIV, 5-42.
- Fama E. F. and Jensen M. C. (1983), Separation of Ownership and Control, *Journal of Law and Economics*, XXVI (2), 301-325.
- Fehr E. and Fischbacher U., (2005b), "Altruists with Green Beards", *Analyse & Kritik*, 27, 73-84.
- Frank R.H., (1988), *Passions within reasons*, New York: W.W. Norton
- Frank R.H., (2005), "Altruists with Green Beards: Still Kicking?", *Analyse & Kritik*, 27, 85-96.
- Gallino L. (2005), *L'impresa irresponsabile*, Einaudi.
- Gordon J. N. (2007), The Rise of Independent Directors in the United States, 1950-2005: Of Shareholder Value and Stock Market Price, *Stanford Law Review*, 59, pp. 1465-1568.
- Heal G. (2005), Corporate Social Responsibility: An Economic and Financial Framework, *Geneva Papers on Risk and Insurance*.

- Hess D. (2006), A Business Ethics Perspective on Sarbanes-Oxley and the Organizational Sentencing Guidelines, *Michigan Law Review*, 105, 1781-1816.
- Hörner J. (2002), Reputation and competition, *American Economic Review*, 92 (3), 644-663.
- Holtfreter K., Van Slyke S., Blomberg T. G. (2006), "Sociolegal change in consumer fraud: From victim-offender interactions to global networks", *Crime, Law, and Social Change*, 44, 251-275.
- Jansen V.A.A. and van Baalen M., (2006), "Altruism through beard chromodynamics", *Nature*, 440, 663-666.
- Kim S. (2001), Markets and multiunit firms from an American historical perspective, in J. A. C. Baum and H. R. Greve (eds.), *Multiunit organization and multimarket strategy: Advances in strategic management*, vol. 18, Oxford: JAI Press.
- Klein B. and Leffler K.B., (1981), "The Role of Market Forces in Assuring Contractual Performance", *The Journal of Political Economy*, 89(4), 615-641.
- Milgrom P.R. and Roberts J. (1986), Pricing and Advertising Signals of Produce Quality, *Journal of Political Economy*, 94, 796-821.
- Nelson P. (1970), Information and Consumer Behavior, *Journal of Political Economy*, 78 (2), 311-329.
- Nowak, M.A., "Five Rules for the Evolution of Cooperation", *Science*, 314, 1560-1563
- Paldam M. (2000), Social capital: one or many?, *Journal of Economic Surveys*, 14, 629-653.
- Paldam M. (2007), Generalized trust The macro perspective, in *Handbook of Social Capital*, forthcoming.
- Parker J. S. and Atkins R. A. (1999), Did the corporate criminal Sentencing Guidelines matter? Some preliminary empirical observations, *Journal of Law and Economics*, XLII, 423-453.
- Pope D. (2008), *Making Sense of Advertisements*, from the Making Sense of Evidence series on: "History matters: The U.S. survey on the Web", <http://historymatters.gmu.edu>.
- Poppe C. and Kjærnes U. (2003), *Trust in food in Europe. A comparative analysis*, Professional Report n. 11, Oslo: National Institute for Consumer Research (SIFO).
- Shapiro C., (1983), Premiums for High Quality Products as Returns to Reputations, *The Quarterly Journal of Economics*, 98 (4), 659-679.
- Smith, Adam (1763/1978). *Lectures on Jurisprudence*. Oxford University Press.

- Sobel J., (2005), "Interdependent Preferences and Reciprocity", *Journal of Economic Literature*, Vol. XLIII, 392-436.
- Sugden R., (2004), *The Economics of Rights, Cooperation and Welfare*, Palgrave-Macmillan, New York.
- Tullock G. (1985), Adam Smith and the prisoners' dilemma, *Quarterly Journal of Economics*, 100, Suppl., 1073-1081.