Journal of Business Economics and Management
ISSN 1611-1699 / eISSN 2029-4433
2017 Volume 18(4): 585–598
doi:10.3846/16111699.2017.1334228

TRUST AS A BOOSTER

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Received 12 December 2016; accepted 21 May 2017

Abstract. In his book *Trust. The Evolutionary Game of Mind and Society*, social psychologist Toshio Yamagishi (2011) states that trust can be viewed as a "booster rocket" that provides the necessary push for the take-off from the secure ground of committed relations. This article formalizes this idea with the help of a simple game theoretic model. The article looks at a situation where networks of personalized exchange relationships provide assurance against untrustworthy behaviour but reduce the opportunity to profit from trade in larger markets. Assuming that the anonymous market contains both trustworthy and untrustworthy types, it is demonstrated that mutual trust relations can emerge, even when there is a clear danger of opportunism and the possibility of repeated interaction is ruled out. From a more practical perspective, the model provides an insight into the role trust plays for the decision to transact in networks or markets. It is also demonstrated that networks appear as mixed blessings. Networks reduce the problems arising from incomplete contracts and behavioural risk, but they also restrict individuals' possibility to reap potential gains produced in larger markets.

Keywords: trust, exchange networks, trade, assurance, opportunism, risk.

JEL Classification: C72, D20, D80.

Introduction

Trust is fundamental to a good society and a prosperous economy. As an extensive and fast growing literature has demonstrated, trust makes life easier, it reduces the cost of precautions and monitoring and it makes cooperation easier[1].

Trust plays an important role in economic exchanges. Without trust, markets do not function and thrive. In impersonal market exchanges, trust is particularly important when contracts are incomplete – as they are in most cases. In a complex world, it is difficult to write down and enforce detailed contracts that include all possibilities that may occur. Incomplete contracts expose economic agents to behavioural risk, meaning

[1] See Fukuyama (1995), Rousseau *et al.* (1998), Hardin (2006), Fehr (2009), Algan and Cahuc (2013), Sapienza *et al.* (2013), Serritzlew *et al.* (2014), Bigoni *et al.* (2016), Granovetter (2017), among many others.

that one or more parties in an economic transaction can be hurt by opportunistic behaviour of others. In such an environment, trust is important. If people generally believe that others will behave trustworthily, mutual beneficial transactions can take place even when contracts are highly incomplete, or even missing.

In settings in which trust matters most (incomplete contracts and clear behavioural risk) individuals may, however, be least likely to rely on trust. Instead, they will seek other types of control mechanisms. A common strategy for dealing with social uncertainty and behavioural risk is to restrict economic transactions to take place within networks or communities (Bowles, Gintis 2004). Networks may function as an effective enforcement mechanism, made possible by small-scale interaction. Within networks, members meet regularly, know each other well, exchange information about each other and may be willing to punish those who fail to keep promises. Because of these behavioural regularities, economic transactions within networks provide greater security against opportunistic behaviour than transactions in more anonymous markets. Hence, networks can be viewed as a solution to the problem of behavioural risk (Kollock 1994; Kranton 1996; Aoki, Hayami 2001; Bowles, Gintis 2002).

Although networks help to solve problems related to behavioural risk they may generate problems in other areas. When economic exchanges are limited to members of a given network, the opportunities to benefit from economies of scale, specialization and gains from trade are restricted. This reasoning is related to Adam Smith's basic idea that there are two key components behind wealth creation: exchange and specialization. In *The Wealth of Nations*, Adam Smith (1776) pointed out that voluntary exchange between individuals creates wealth in itself, but this wealth can be increased if individuals are allowed to specialize in those activities in which they have a comparative advantage. At the same time, he observed that it is the size of the market that determines the degree to which people can specialize and thus create wealth. It follows from this reasoning that networks appear as mixed blessings – they reduce the problems arising from incomplete contracts and behavioural risk, but also restrict individuals' possibility to reap potential gains produced in larger markets.

This type of reasoning forms the basis for the analysis of trust developed by the social psychologist Toshio Yamagishi. According to Yamagishi (2011), trust is important because it helps people to move out of established networks and form relationships with new partners that offer new opportunities[2]. His argument can be summarized as follows: when people face uncertainty in their transactions they tend to build commitment relationships (networks), which reduce uncertainty and provide assurance against opportunistic behaviour. One problem with this strategy is that it reduces the possibility of trading with strangers outside of the network – trading that might give higher returns if the strangers were trustworthy. Hence, the main function of trust is that it acts as a "booster" that enables people to move out of mutually committed relations and invest their resources in more uncertain but at the same time more profitable projects.

[2] See also Yamagishi T. and Yamagishi M. (1994) for an earlier statement.

While Yamagishi's idea about trust is widely cited within the general social science literature, it has received little attention in the business and economics literature. The main purpose of this paper is to formalize Yamagishi's idea within a simple game theoretical framework and thus contribute to a better understanding of *why* and *when* trust is important for well-functioning market exchanges.

Why is trust important? In line with Yamagishi's definition, I work with the following concept of trust: trust is an expectation that people in general will not act opportunistically even when they have the opportunity to do so. In the model developed below it is shown that this type of general trust is important because it functions as a springboard into the outside world of opportunities. That is, trust "emancipates" players from the restrains of established relations and helps them to seek out new relationships and new possibilities[3].

When is trust important? In situations when the possibilities to harvest gains from exchange in large markets are limited, networks may serve as a good organizational principle since the risk of being the target of opportunistic behaviour is low. Inside networks, honest behaviour is assured by the nature of the incentives facing network members. Hence, networks lower transaction costs and reduce the need for formal contracts. However, in a situation where players face more and better opportunities outside of networks, trust becomes important. If people do not trust outsiders, they may not be willing to engage in potentially fruitful economic transactions outside networks. People prefer to stay in existing networks, and therefore fail to reap potential gains.

The rest of the paper proceeds as follows: the next section presents a simple game theoretic model of trust based on the ideas of Yamagishi (2011). The model is then used to analyse the role trust plays for the decision to transact in networks or markets and how lack of trust creates problems in situations where the opportunity cost of networks is large (Section 2). In the final section, the concept of trust used in this paper is compared with other notions of trust suggested in the literature. This comparison is followed up with a discussion of the need to distinguish between "trust" and "assurance", a distinction underlined by Yamagashi (2011), but that has not been noticed clearly in past research on trust.

1. Model

1.1. Costs and benefits of networks and markets

Consider two players m and n who have the possibility of either managing on their own or exchanging goods and services with each other. The former strategy produces the payoff d for both, while the latter strategy gives both a payoff of c. There are gains from trade, which means that $c > d$.

Assume now that all trade is governed by incomplete contracts, which gives room for opportunistic behaviour. Incomplete contracts does not, however, create any problems

[3] Yamagishi's theory of trust is therefore often referred to as the "emancipating theory of trust".

for trade that takes place within networks. Following Yamagishi (2011), we assume that networks give full assurance against opportunistic behaviour. Due to repeated interaction, social control and threat of retaliation against opportunism, networks allow informal agreements on cooperation to be self-enforcing (Fudenberg, Maskin 1986; Gibbons 2001). We model this in the following simple way: if players *m* and *n* form a network and trade with each other, they receive the payoff *c* with certainty.

Due to their small size and restricted exchange possibilities networks may, however, restrict the ability to achieve further benefits related to gains from trade in larger markets. Again following Yamagishi (2011: 53), we term this the *opportunity cost* of networks: "… a commitment relationship is a relationship in which one is paying an opportunity cost. When one maintains a commitment relationship, one foregoes opportunities for getting a better outcome offered by alternative partners. That better outcome forgone is the opportunity cost". This opportunity cost can be taken into account by assuming that the players can reap the payoff *b* by trading outside the network, where $b > c$. We call this a market transaction.

Although a market transaction produces a higher payoff if the partner acts trustworthily, a market transaction also produces behavioural risk. As players in the market are unknown to one another, their interactions are effectively non-repeated, precluding the formation of self-enforcing agreements on cooperation that is possible for interactions within networks. Yamagishi (2011: 54) refers to another economic concept, *transaction costs*, to illustrate the problem this creates: "Transaction cost is the time, effort, money etc., that is consumed to conduct transactions.... Losses from being cheated in transactions are also included in transaction cost...". The latter point is particularly important in Yamagishi's analysis, and we take it into consideration in our model in the following simple way: If a player decides to leave a network and jump into a transaction with a stranger in the market, the player reaps the payoff b if the stranger is trustworthy. If the stranger is untrustworthy the player suffers a loss of $-e$.

The balance between costs and benefits will then shape the players' decision to transact in networks or markets. On the one hand, a market transaction produces a risk of opportunistic behaviour, which leads to a loss of $-e$. This risk is removed within a network, which produces the payoff *c* with certainty. On the other hand, networks restrict the ability to achieve further benefits related to gains from trade (the payoff *b*). Stated in the words of Yamagishi (2011: 54): "… formation of a commitment relationship reduces transaction cost on the one hand, but generates opportunity costs on the other hand. Whether or not formation of commitment relationships with specific partners is a clever choice depends on the relative size of the savings in the transaction cost and the opportunity costs incurred". However, regardless of the size of costs and benefits related to networks and markets, trust plays an important independent role for the decision regarding where to transact. This can be seen more clearly from Figure 1, which summarizes available actions and payoffs in a market transaction.

To simplify, the market is assumed to be composed of a large number of players who act in pairs. Again, we consider the two players *m* and *n*. They are now, however, assumed to be members of their respective networks *A* and *B*. A market transaction where

		Player n from network B	
		Cooperate	Defect
Player m from network A	Cooperate	$b,\ b$	$-e,\ a$
	Defect	$a,\ -e$	$0,\ 0$

Fig. 1. Payoffs from market transactions

both players cooperate (act trustworthily) gives them a payoff of b. If both defect (act untrustworthily) they get a payoff of 0. If m cooperates and n defects, m suffers a loss of $-e$ while n gets a, and vice versa. If $a > b > c > 0 > -e$ the economic interaction is described by the familiar Prisoner's Dilemma game. When actions taken by each are not subject to complete and enforceable contracts, "defect" is the dominant strategy equilibrium for this interaction. If all players know this, there will be no market transactions. Both players stick to their networks where they get the payoff c (with certainty), and the gains from trade will not materialize.

However, both everyday observations and results from controlled experiments show that many act cooperatively in situations like the one described above (Fehr, Gächter 2002; Ostrom, Walker 2003; Fehr, Gintis 2007; Bowles, Gintis 2011; Bowles 2016). This is difficult to explain within the theory of rational choice where people have self-regarding preferences (Simpson, Willer 2015). Partly because of this, there has been increasing focus also among economists on the role of social norms in regulating behavior in social dilemmas and society at large (Fehr, Fischbacher 2004; Bowles, Gintis 2006; Young 2015; Peysakhovich, Rand 2016; Yu *et al.* 2016).

Following this literature we can assume that besides monetary considerations (captured by the payoffs in Figure 1), players also care about norms. Consider the following norm of cooperation: "It is wrong to act uncooperatively against a person who cooperates". Assume also that this norm is fully internalized by those who carry it, implying that the norm means something for the individual also in situations where violation of the norm is impossible to detect and sanction by others.

Let $z > 0$ indicate the internalized socio-psychological cost of breaking the norm of cooperation. This means that the behaviour "defect" against a cooperating partner gives $a - z$ instead of a. From the payoff matrix shown in Figure 1 we then see that a player will cooperate when the other player cooperates if $b > a - z$, i.e., if $z > a - b$. Let us further allow individuals to be of two types: those with $z = 0$ are referred to as *untrustworthy types* and those with $z > a - b$ are referred to as *trustworthy types*. Hence, an untrustworthy type always defects while a trustworthy type cooperates if the other player cooperates (the trustworthy types have Assurance Game preferences while the untrustworthy types have Prisoner's Dilemma Game preferences). The proportion of trustworthy types in network A is denoted p_A, while the proportion of trustworthy types in network B is denoted p_B.

On the anonymous market, the players do not know the type of their partner. Assume, however, that players have an expectation about the proportion of trustworthy types. The proportion of trustworthy types determines the probability of not being cheated on the anonymous market. The expectation about others' trustworthiness is therefore a measure of trust in society. If the players perceive the probability that other players act trustworthily (cooperate) as low, they will be more reluctant to take the chance of entering the market. This is particularly true if the payoff from trade in networks is high, if the cost of being cheated is high or if the gain from trade in markets is relatively low. If, however, the payoff from trade in markets is high relative to the payoff from trade in networks, players may be willing to leave their networks even for a low level of trust. They are willing to take the chance of being cheated because the gain from a mutual trust relationship is so high.

This discussion illustrates that the decision to transact in networks or markets is not straightforward, but depends on the interplay between the players' expectation about others' trustworthiness as well as the cost and benefits of markets and networks. A more formal analysis of the players' decision problems is therefore needed in order to derive their results and discuss their implications.

1.2. Take-off from networks

We are particularly interested in specifying the conditions for the emergence of mutual trust relationships on the market. That is, we search for an equilibrium in which players *m* and *n* leave their networks, and trustworthy types cooperate while untrustworthy types defect. This equilibrium expresses a typical situation of trust: trust is important when a person faces a possibility of getting a higher return and a risk of being cheated simultaneously.

The social interaction specified above consists of two stages: in the first stage, players *n* and *m* have to decide whether to stay in their networks or enter the market. If they decide to enter the market, they play a game with incomplete information about the type of each player, where they have to decide whether to cooperate or not. By solving the game by backward induction we can specify the conditions for the formation of mutual trust relationships. We first derive the condition for trustworthy types to act trustworthily on the market. Then we derive the condition for both trustworthy and untrustworthy types leaving their respective networks, given that the trustworthy types act trustworthily. Since the game is symmetric, with payoff structures of the same types of players being identical, we can look at the decision facing a trustworthy and an untrustworthy type from network *i*, where $i = A, B$.

A trustworthy type cooperates on the market if the expected payoff of doing so is larger than the expected payoff of defecting, that is if $p_i b + (1 - p_i)(-e) > p_i (a - z) + (1 - p_i)0$. This inequality is satisfied if

$$p_i > \frac{e}{z + b - a + e} \equiv p_i^+, \tag{1}$$

where $p_i^+ \in (0,1)$ since $z > a - b$. Recall also that an untrustworthy type never cooperates.

The next step is to find the condition for the two types leaving their respective networks and entering the market, given that (1) is satisfied. A trustworthy type will enter the market if the expected payoff from a market transaction is larger than the payoff from staying in a network, that is if

$$p_i b + (1 - p_i)(-e) > c. \tag{2}$$

Likewise, an untrustworthy type will enter the market if the expected payoff from a market transaction is larger than the payoff from staying in a network, that is if

$$p_i a + (1 - p_i)0 > c. \tag{3}$$

By comparing the left hand side of (2) and (3) we see that the expected payoff from a market transaction is higher for the untrustworthy type for every $p \in (0,1)$. Compared to a trustworthy type, an untrustworthy type gets a higher payoff no matter what type he meets. Since trustworthy types cooperate, they will never get the highest payoff *a*, and since the untrustworthy types always defect, they will never suffer the cost *e* from being cheated. This means that if inequality (2) is satisfied, and the trustworthy types enter the market, the untrustworthy types will do the same. It is therefore enough to focus on equation (2), saying that both a trustworthy and an untrustworthy type will enter the market if

$$p_i > \frac{c+e}{b+e} \equiv p_i^*. \tag{4}$$

It follows from the above reasoning that we have an equilibrium, in which all players leave their network *and* trustworthy types cooperate and untrustworthy types defect, if the inequality $p_i^* > p_i^+$ holds. However, we can have parameter values where this inequality does not hold. From (1) and (2) it follows that $p_i^* > p_i^+$ if

$$z > a - \frac{c(b+e)}{c+e}. \tag{5}$$

By assumption, we have that, $z > a - b$. Since b is greater than $c(b + e) / (c + e)$ it follows that the condition given in (5) is stronger than the condition $z > a - b$. We can therefore conclude that if (5) holds, that is if the norms of cooperation is strong enough, the inequality $p_i^* > p_i^+$ also holds[4]. (4) then gives the condition for mutual trust relationships to be formed on the market.

(4) says that trustworthy types take the risk of leaving their networks and cooperating on the market if they perceive the probability that the (unknown) counterpart behaves trustworthily as large enough ($p_i > p_i^*$). Hence, (4) is a formalization of Yamagishi's (2011: 55) idea that in situations; "…in which both social uncertainty and opportunity costs of maintaining commitment relationships are large, general trust..., plays the role of a 'booster rocket' providing necessary 'thrust' from the 'takeoff' from commitment relationship".

[4] I thank a JBEM reviewer for pointing this out.

How much trust is needed in order to establish mutual trust relationships? As can be seen from (4), this depends on the ratio between the payoffs produced in networks and markets (b, c and e), since these payoffs determine the size of the critical value p^*. e is the cost of being cheated on the market. It follows from (4) that an increase in e drives up p^*, making it harder to form mutual trust relationships, unless the players are more trusting. Put differently: if the cost of being cheated is high, players will be reluctant to run the risk of being cheated unless they are very sure that other players are trustworthy.

(4) also illustrates that the payoffs b and c affect the critical value of p^* in a natural way. b is the payoff from a mutual trust relationship on the market, while c is the payoff from staying in a network (where $b > c$). Remember that c is received for sure within a network, while b is received with probability p outside the network. That is, the payoff b comes with a risk of being cheated. The larger c is, the higher p^* must be, and the more trust must be present for the trustworthy types to take the risk of entering the market. Increasing the payoff from a mutual trust relationship (b) has the opposite effect. An increase in b lowers the threshold p^*, making it easier to form a mutual trust relationship at lower levels of trust. The greater the value of mutual trust, the greater risks the players will be willing to take in an effort to achieve it.

The relationship between b, c and e can be interpreted as the relationship between transaction costs and opportunity costs, if we employ the terminology of Yamagishi (2011). b is the opportunity cost of networks, defined as the forgone opportunities for getting a better outcome outside the network. The higher this opportunity cost is (for a given c and e), the more networks appear as a constraint rather than an asset. On the other hand, a player can save transaction costs by staying in a current network in which untrustworthy behaviour is precluded. Hence, networks appear more attractive the higher c and e are (for a given b). In sum, whether or not it pays to stay in current networks depends on the relationship between transaction costs and opportunity costs.

2. Limits of networks and the role of trust

2.1. Paradox of a network society

It follows from the above analysis that if the level of trust is low and people feel the need to safeguard their interests in established networks, it will be harder to profit from trade in larger markets. Again, note that b is the opportunity cost of networks, defined as the forgone opportunities for getting a better outcome outside the network. A main point highlighted by Yamagishi (2011) is that this opportunity cost of networks is steadily increasing due to a more integrated world economy and larger markets. In this situation, general trust is the key for a successful reorganization of society, which implies more connections and trade that expands beyond established networks.

To illustrate this observation, Yamagishi (2011) offers an interesting discussion of the recent history of economic development in Japan. From being an economic "success-story", Japan today is marked by a lack of innovation and poor economic performance. Yamagishi argues that this is partly due to the rigid and dysfunctional social, political and economic networks that dominate Japanese society. Yamagishi (2011) states that Japan clearly can be characterized as a network society. The well-known keiretsu net-

works among business firms is one example. Strong and stable business networks have been an important element of the Japanese management practices because they have made it possible to secure a high level of cooperation among network members (securing a payoff of c if we relate the argument to the model developed above).

At the same time, networks also restrict the possibilities to capture gains from exchange and specialization in larger markets. This is the opportunity cost of networks, and this cost is rapidly increasing as noted above. As Yamagishi (2011: 5) argues, in order to capture the gains that trade in larger markets make possible "…Japanese society needs to abandon the collectivist behavioural pattern centred around the security of stable relationships, and distrust in and discrimination towards outsiders". Japanese society needs a transformation "…from a security-seeking society characterized by closed and collectivist social relationships to a more open type of society in which opportunities play a more prominent role". But this transformation of society can be difficult to accomplish. Yamagishi provides a lot of evidence, from both surveys and experiments, showing that strong and stable networks generally produce security but destroy trust[5]. Hence, the level of general trust in Japan is quite low compared to other industrialized countries[6].

The problems created by a lack of generalized trust, when the opportunity cost of networks increase, can be illustrated more formally with the help of Figure 2 and the model developed above.

The grey area in Figure 2 shows the range of p that enables mutual trust relationships outside networks, for a given value of c, e and b, where the critical value of p^* follows from (4). If the players have an expectation about others' trustworthiness that is lower than p^* (e.g. $\tilde{p}$), they will not risk entering the market. They decide to stay in their current networks. Given their expectations, the players consider the payoff from a market transaction (b) as too low relative to the payoff from a network transaction (c) and the cost of being cheated on the market (e).

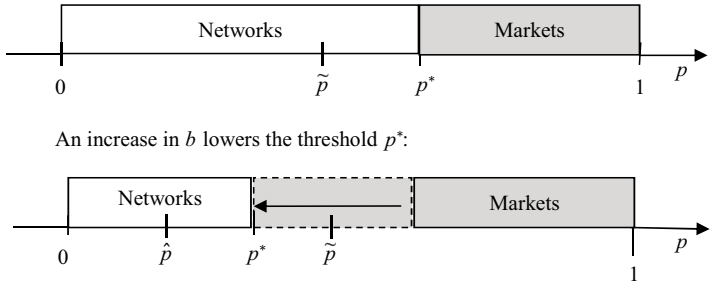

Fig. 2. Range of p that produces mutual trust relationships

[5] See Yamagishi (2011, chapter 5 and 6) for more details and Yamagishi (2011, chapter 7) for a discussion of mechanisms that may explain why assurance networks seem to crowd out generalized trust.

[6] In particular, Yamagishi (2011) demonstrates that Americans have a higher level of general trust than the Japanese have.

If b increases, making trade on the market more attractive relative to network trade, p^* moves to the left. Players may then be willing to enter the market and establish trust relationships depending on their expectations about others' trustworthiness. If the players have an initial expectation about p that is in the new shaded area (e.g. $\tilde{p}$), they will move out of their current networks when b increases. If, however, the players have an expectation about p that is outside of the shaded area (e.g. $\hat{p}$), they will stay in their current networks despite the increase in b. Hence, both the individual and society will not be able to reap the increased gains produced in markets due to lack of trust. People are locked into inefficient networks. This seems to be the situation faced by Japanese society today.

2.2. High-trust societies

It follows from the above reasoning that the societies that will be most successful in profiting from rapidly increasing benefits associated with free and open trade are those that possess a high degree of general trust. The Nordic countries (Denmark, Finland, Norway and Sweden) may serve as interesting cases. Algan and Cahuc (2013) have collected data for average levels of generalized trust for 111 countries, generated from responses to various surveys[7]. These surveys ask the familiar question "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people"? The trust variable is given the value 1 if the respondent answers that "Most people can be trusted" and 0 if the respondent replies that one "Need to be careful". Trust levels vary substantially between countries, with Norway, Sweden, Denmark and Finland as the top four in the ranking. In Norway, 68.1 percent of the population trust others. At the opposite end of the ranking lies Trinidad and Tobago, with an average trust level of only 3.8 percent. In Japan, 41.6 percent of the population exhibit interpersonal trust. The Nordic countries are thus clearly high-trust societies. If we look at rankings of countries according to their GDP per capita, we also find the Nordic countries are among the richest in the world. Is it a link here?

Seen in the light of the model developed above, the good economic performance of the Nordic countries may be partly due to their high trust levels and their ability to exploit the gains both from networks and markets. The Nordic countries are well known for embracing free trade and openness. Measured by import and export relative to GDP, the Nordic countries are among the most open economies in the world (Barth, Moene 2013). This may be seen as an indication that these countries have managed to secure a good combination of networks and markets, producing good economic performance. Admittedly, this observation has a distinctly speculative flavour. On the other hand, it is not "merely" a speculation, but a speculation guided by structured economic reasoning.

It is beyond the scope of this paper to test the model just outlined. However, the above discussion point to a link between trust and economic performance that has been little investigated. Societies with a high level of general trust may be able to secure a better

[7] The World Values Survey, the European Values Survey, and the Afrobarometer.

mixture of networks and more open-market type relationships compared to low-trust societies (where closed-network type relationships will dominate). I think this observation deserves more attention in future empirical work[8].

Discussion and conclusions

Lack of information and incomplete contracts expose people to social uncertainty and behavioural risk. A common strategy to deal with this is to restrict economic transactions to take place in networks. Networks allow informal agreements of cooperation to be self-enforcing through repeated interaction and the threat of retaliation against opportunism. Hence, networks may be regarded as a mechanism for the reduction of behavioural risk. At the same time, networks generate an important opportunity cost. Due to their limited size and exclusionary practices, networks restrict the opportunities to benefit from trade in larger markets. When the gains from market transactions are large, maintaining networks is not necessarily advantageous even though they reduce behavioural risk. In this situation, trust becomes important. According to Yamagishi (2011), trust is a "booster" that helps people to move out of established networks and form relationships with new partners that offer new opportunities. The main aim of this paper has been to formalize this idea of trust with the help of a simple game theoretic model, and by this to contribute to a deeper understanding of the role trust plays for the decision to transact in networks or markets. The model developed demonstrates that trust makes it possible for players to break out of established commitments and invest their resources in more uncertain but also more profitable projects on the anonymous market. The level of trust needed to form market transactions depends on the ratio between the payoff produced in networks and markets.

Another contribution of the model is that it highlights the need to distinguish between "trust" and "assurance", a distinction underlined by Yamagashi (2011), but that has not been noticed clearly in past research on trust. Yamagashi's discussion of whether Japan should be characterized as a trust-society or not, illustrates the need to be clear about the difference between trust and assurance. It is not difficult to find influential writers who have interpreted the many social, political and economic networks in Japan as cooperative enhancing and as a sign of widespread trust. Although the first part of this statement may be true, the second can be questioned. Networks typically remove the incentives to act opportunistically through repeated interaction, easy access to information about the network members' behaviour and informal sanctions. It is therefore not trust that secures cooperation within networks. Cooperation is assured through the iterated nature of the relationship and the social structure surrounding the network members. In short: cooperation inside networks does not need trust. Trust becomes important in situations

[8] Other testable hypotheses derived from the "emancipating" theory of trust modelled in this paper, are presented and discussed in Yamagishi (2011, chapter 6). Yamagishi also gives a review of work that have tested some of these hypotheses. The findings lend empirical support to the propositions that behavioural risk leads to network formation and that low trusters are more likely to form and maintain networks than are high trusters (where high trusters are defined as individuals whose expectation of others' trustworthiness is high).

characterized by social uncertainty, that is in situations where you do not know whether your trading partner is trustworthy or not. This is typically the situation in which transactions take place in anonymous markets.

The concept of trust is playing an increasing role in economic analysis. Still, there is little agreement on what trust really is, and the mechanisms that link trust and economic outcome are disputed. The most common way of understanding trust in economics is to relate it to expectations. Trust is expectations about others trustworthiness: *A* may trust *B* because *A* thinks that *B* is trustworthy. Yamagishi (2011) belongs to the tradition that views trust as an expectation. Still, his approach to trust is different from the most common way of explaining trust in economics. In standard economics, trust and cooperation are mainly justified as a result of repeated interaction and maximization of long-run self-interest. The mechanism supporting this result is rather straightforward: trust and cooperation are achieved by the recognition by each player that what might be gained by cheating "today" is outweighted by the value of continued cooperation into the future. Hence, trustors expect trustees to act trustworthy because trustworthy behaviour secure trustees' long long-term interests.

Yamagishi (2011) argues that the theory of repeated games is not the most fruitful starting point for an understanding of trust. His arguments are closely related to the above discussion about the importance of distinguishing between trust and assurance. Repeated interaction removes social uncertainty, or at least reduces it to a minimum. This is particularly true for repeated interaction within networks. Actors within stable networks generally feel safe with insiders. In such situations, it is more meaningful to talk about assurance instead of trust, where assurance refers to expectations of honest behaviour based on the knowledge of the incentive structure surrounding the relationship. As highlighted in the model developed in this paper, trust becomes important when actors consider moving out of networks to deal with strangers that offer new opportunities and more profitable projects, but where these strangers are unconstrained by explicit or implicit promises of future rewards or punishments.

Finally, the model developed clarifies the relationship between trust and risk, a relationship that many consider essential. The model illustrates that trust generates economic gains, at the same time as it also opens up for opportunism and exploitation. Those who trust others face the possibility of being exploited by untrustworthy others. Seen in this way, trust does not remove or reduce risk – trust creates risk.

Acknowledgements

I thank anonymous JBEM reviewers for helpful comments and suggestions.

Disclosure statement

The author declares that he has no competing financial, professional, or personal interests from other parties.

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