The Economic Notion of Trust

Theodosios Tsiakis
Department of Economic Studies
University of Thessaly
Korai 43, Volos 38333, Greece
tsiakis@gmail.com

Abstract

It is apprehended that the human element of trust is becoming the number one asset for the financial organisations. And since trust is a matter of relationships, financial organisations need to create, expand and maintain consumer trust for communication, transactions and payments. Financial institutions are known for their ability to cultivate long-standing relationships with their clients based on integrity and trust. And as we move towards electronic-based transactions, there is the need to explore the factor of trust in order to identify how financial organizations are shaped in the future and what issues are raised. Trust always affects two measurable outcomes: speed and cost and there are essentially two mechanisms that lead to economic notions of trust, the one is based on repeated interaction the other one is based on beliefs. The ultimate goal is to engage online commerce users quickly and establish and preserve strategic trust under challenging situations. In the e-commerce context, based on the target, the study of trust can be categorized as macro-level or micro-level. The macro-level study of trust deals with what called institution-based trust and the micro-level study of trust is different from the macro-level study in that the target of the former is an individual e-business. The research questions that are brought in the surface are: what exactly is trust in the on-line environment? What are the sources of trust? Is there more than one form of trust? Is it a static or dynamic phenomenon etc. The paper will try to explore, examine, and describe the methods for estimating the economic value of trust (cost of developing trust, maintaining trust and trust failure), the impacts of trust on e –economy (general finding) and how trustworthy financial organizations are created and finally financial organizations benefit from trust.

Keywords: *trust, e-commerce, information security economics.*

1. Introduction

Nowadays, an increasing amount of information is being created, stored and distributed in digital formats through computer networks [1]. This computer mediated transactions bring about risks that are caused by System-dependent uncertainty (of using open technological infrastructures for the exchange of information) or by Transaction-specific uncertainty (the conduct of actors who are involved in the on-line transaction) [2]. This uncertainty of economic transactions, based on System-dependent uncertainty (meaning events that are beyond the direct influence of actors and Transaction-specific uncertainty (seen as endogenous or market uncertainty resulting from decisions of economic actors) enhance the reasons that trust is important in online (virtual) environments [3]. Financial transactions that are made in an environment of

imperfect knowledge will always contain a degree of risk [4]. It is important to mention that transactions are atomic. In other words, the entire transaction should be carried out in a fault tolerant way such that no party involved in the transaction may be put at a loss after the completion of the transaction [5]. Although the deficiency of data on how trust is structured in an online context, McCole [6], through literature review reveals ten dimensions cited most frequently:

1. Availability – information must always be available to the potential consumer.
2. Competence – the people and the system are expert at completing a transaction.
3. Consistency – every single time a consumer transact via a particular medium the process should be the same.
4. Discreteness – any information exchanged during the transaction would not be disclosed.
5. Fairness – the cost saving as opposed to other media, that is the fairness of pricing.
6. Integrity – signify the honesty of information presented.
7. Loyalty –effects of one interaction with a medium to re-purchase using the same medium.
8. Openness – all information needed are available and clearly communicated to the potential consumer (example: prices, tax).
9. Promise fulfilment – the consumer will receive the commodity exactly as it was described
10. Receptivity – examination of information sent to potential consumers.

Bock [7] states that in electronic commerce projects trust is build by:

1. User involvement
2. A clear legal framework
3. Harmonisation
4. Procedures
5. Error handling
6. Assistance
7. Transparency
8. Stages
9. Integration
10. Security
11. Freedom of choice

The dilemma financial organisations face today is striking the right balance between building trust through openness, and the protection of their interests from fraud, loss of confidential information, vandalism, employee theft and mainly the forms of economic loss [8]. Moreover companies put emphasis on building a trustworthy_image [9].

A basic question is how trust is structured in an online context. Despite the various definitions, it is possible to summarise trust in the context of a business transaction as the relationship between different parties, the time that is needed to build and nurture the relationship, the way tangible and/or intangible assets exchange and how can the exchange can be carried out more securely. The classical visible interaction, also referred as face-to-face, gives the participants the option of interactivity, visibility, and social information [10]. But as face-to-face interactions are replaced by technology-mediated interactions, trust become a key issue, due to the fact that low-trust interactions are expensive (both in economic and human terms) and because we need to be able to establish and evaluate trust relationships relying only on electronic interactions over the Internet [11], [12]. Since technology mediation constitute the epicentre of the challenge of building trust online, it is important to understand how different uses and implementations of the technology may influence trust [13].

Financial institutions are known for their ability to cultivate long-standing relationships with their clients based on integrity and trust [14]. And as we move towards electronic-based transactions, there is the need to explore the factor of trust in order to identify how financial organizations are shaped in the future and what issues are raised. Further more, the major problem is that consumer financial transactions create a large amount of personal data and due to this fact, financial organizations are high value targets. These information assets and business are susceptible to data manipulation, data disclosure, data destruction and disruption of business. So, the today challenge financial organization face is to develop trusted electronic transactions.

Without the existence of trust, the business partners will not share information openly and transact with out guaranteed contracts that prevent exploitation [15]. In internet – technology channels trust doesn't simply refers to trust between the Internet merchant and the consumer, but between the consumer and the computer system trust through which transactions are executed [16].

2. Towards a theory of Trust

Reviewing literature we find a plethora of definitions. Jones [17] states "that in general, we say that a person trusts someone to do X if she acts on the expectation that he will do X when both know that two conditions obtain: if he fails to do X she would have done better to act otherwise, and her acting in the way she does gives him a selfish reason not to do X". Blois [18], states that "trust refers to when the other party makes its self vulnerable to the other party's behavior''. Lehti and Nikander [19] state "that trust is a belief that an entity will behave in a certain way". Further it distinguish trust to machinery trust and people trust. Trust to a machinery is usually a belief that it works as specified. Trust to a person means that even if someone has the possibility to harm us, we believe he/she chooses not to. Hosmer [20], "defines trust as the expectation that the other parties will behave in accordance with commitments, negotiate honestly, and not take advantage, even when opportunity arises". This definition is more appropriate due to its applicability to virtual transaction based e-commerce. It becomes clear that trust relationship performs between a trustor, the subject that trusts a target entity, called the trustee [11].

Pragmatically, our everyday life, without trust, would be confronted with extreme complexity, every single minute [21]. Given that technology mediation is at the root of the

challenge of building trust online, it is important to understand how different uses - both implementations of the technology may influence trust.

Trust is a complex and abstract concept. It is difficult to define trust and to identify the elements that construct it [22]. Trust in general includes the following characteristics [1]: Increases with familiarity, is linked to a given condition, requires accountability and tangibility and is often associated with scale. As Patton and Josang [23] refer trust has a catalytic function as it allows people to interact instant and associates the economy to operate smoothly. Primary, trust consists of two components: 1) Concerns of how we feel about being trusted and to be trusted and 2) Concerns of how we feel about having to trust other people [24]. The variety of multiple definitions that literature of trust presents is mainly caused by two reasons: trust is an abstract and multi-faceted concept. In general, previous research examining trust conceptualized it in one of two ways: (1) as a set of specific beliefs about the specific other party dealing with and (2) as a general belief that the specific other party can be trusted [25].

Trust is a key enabler of cooperative human actions. The ultimate goal is to engage online commerce users quickly and establish and preserve strategic trust under challenging situations. In the e-commerce context, based on the target, the study of trust can be categorized as macro-level or micro-level. The macro-level study of trust deals with what called institution-based trust and the micro-level study of trust is different from the macro-level study in that the target of the former is an individual e-business [26]. People collect multiple sources of evidence by which they create - built trust. A person passes through two stages in his/her potential interaction with a web-based vendor [27]. An exploratory stage, in which the person is trying to decide whether or not to explore the web site to see what it offers. And if the passes to the next process, where the user decides to pursue the experience, then there is the commitment stage that the user interacts.

In the context of a business transaction trust is defined as [28]:

1. It is about the relationship between different parties.
2. It takes time to build and nurture the relationship.
3. The relationship involves the exchange of tangible and/or intangible favours.
4. It is needed whenever parties recognise the existence of any risks or uncertainty.
5. When it exists, the exchange can be carried out more smoothly.

The designer's goal is to engage users quickly and establish and preserve strategic trust under challenging situations [29].

The term "trust" can basically distinct between two basic meanings. In computer literature in the term that is used to denote that something must be trusted and on the other hand in more psychologically oriented literature, the term is used to denote that something can be trusted [30]. Calcanis et al. [31] summarise that the requirements for trust in a technical system, are the following: faith, dependability, predictability, competence, persistence, responsibility, privacy and of course risk.

Viewing previous terms as trust and trustworthiness we need to make a between trust and trustworthiness [32], in that as Gefen et al. [33] referring "*trustworthiness,* is the trustor's perception of how trustworthy the trustee is, while *trust*, is the trustor's willingness to engage in a risky behavior that stems from the trustor's vulnerability to the trustee's behavior",

continuing "rustworthiness is a characteristic of the trustee, and may stem from several perceptions of the trustor about the trustee, and trust is the trustor's intentions or behavior with respect to the transaction. As trust compose an attribute of a relationship between partners (independent organizations that participate in cooperative alliance agreements), trustworthiness, contrast to trust, is an attribute of individual exchange partners and defined as the ''compound virtue of being dependable, capable, responsive and responsible [34]. So and Sculli [28] suggest three dimensions for trustworthiness evaluation:

Reputation, influence one's willingness to enter into an exchange

performance, in that people tend to believe the most recent information available

appearance, refers to that of agents, employees

On the opposite side of trust is Distrust expressed as a quantified belief by a trustor that a trustee is incompetent, dishonest, not secure or not dependable within a specified context [11]. However Trust and distrust are not simply opposite ends of the same spectrum but coexist on the basis that people in any given situation people employ both trust (ex. the value of a strong brand) and distrust (ex. a reluctance to buy online) to reduce complexity and uncertainty [34]. Simply distrust is the cost of replacing each person that checks out of a transaction due to insufficient trust.

3. Economic impact of trust

It is apprehended that the human element of trust is becoming the number one asset for the financial organisations. And since trust is a matter of relationships, financial organisations need to create, expand and maintain consumer trust for communication, transactions and payments. The research questions that are brought in the surface are: what exactly is trust in the on-line environment? What are the sources of trust? Is there more than one form of trust? Is it a static or dynamic phenomenon? How can we express trust under certain circumstances? Will economic organisation theory show consensus on the definition of trust [35], [36]? Moreover, the financial organisations are ought to address:

- The methods for estimating the economic value of trust (cost of developing trust, maintaining trust and trust failure)
- The impacts of trust on e –economy (general finding)
- Microeconomic & Macroeconomic analysis: costs / benefits analysis for all economic entities
- The importance of trust both in personal and business level
- What are the analogies of investment between trust and security
- How trustworthy financial organizations are created and finally financial organizations benefit from trust

Answering these questions we might be able to identify the economic aspects of trust in financial organisations.

Economic analysis usually endogenize trust as decision to trust or be trustworthy is analyzed in terms of expected costs and benefits (in monetary terms). Economists on the base assume the existence of opportunistic behavior in economic partnerships [37], as James [38] referring "A trusts B, meaning that A expects B will not exploit a vulnerability A has created

for himself by taking the action". But economists have not traditionally paid much attention to the role of trust in market exchange [39]. Under Ba [40] "trust is an on-going economic calculation whose value is derived by comparing the outcomes resulting from creating and sustaining the relationship to the costs of maintaining or severing it". Chu and Dyer [41] view trust particularly in exchange relationships to be a valuable economic asset because as "it has been described as an important antecedent to effective interorganizational collaboration specific in 1) lowering transaction costs and allow for greater flexibility to respond to changing market conditions, (2) leading to information sharing which improve coordination and joint efforts to minimize inefficiencies and 3) facilitating investments in transaction or relation-specific assets' which enhance productivity". According to Roth [42] trust has three direct channels through which it might stimulate economic growth.

Firstly, trust has a direct effect on economic performance through reducing transaction costs, secondly, trust has a direct influence on growth because it enables actors to solve collective action problem and thirdly, direct effect is that principal-agent problems might be much less significant in high-trust societies. The primary extrinsic value of trust is that it reduces transaction costs the primary intrinsic value is that trust reduces suspicion and enables more cooperative behaviour [43]. The economic significance of trust as transaction facilitator becomes clear as it is cost less than control and safeguards [44]. Besides that, trust is economic significant as it contributes to commitment that is an essential ingredient for successful long-term relationships [45]. Economic organisations are attempting both to create trust and to economise on its use [46].

The economic paradigms of trust are relying on two concepts [47], [41]:

(1) the prisoner's dilemma in which two players' decisions are associated with monetary rewards and

(2) transaction cost analysis in that there are transaction and production costs (search, contracting, monitoring and enforcement) of doing business between firms.

Both concluding that "It's a vice to trust all, and equally a vice to trust none." [48]

3.1. Prisoners dilemma (PD)

The Prisoner Dilemma is an experimental game, of non-repeated transaction, played by two players', a short-run buyer (trustor) and a long-run seller (a trustee), conditioned by it's decisions, that is interesting for economists because the behavior of players, participating the game, shape the patterns of behaviour in transaction [40], [49], [50], [51], [52].

The game illustrates a consumer situation in which a seller who is in the market for a period trades with buyers (mainly new) who only make one purchase. The typical process, in online phase, is that a seller posts a product on the market (with description, condition and price of the item) willing to sell. Each transaction is a non-repeated action. Each of them can choose to play one of two strategies: Honest or Cheat to either Trust or Distrust. Table 1 presents the payoff structure of the PD game where in a period *t*. If one player decides to cheat while the other is honest, then the cheater has his highest payoff of (1 + g), while the honest one gets his lowest of $-l$, where l and g are positive constant coefficients and $g - l < 1$. This status gives both sides an incentive to cheat, even though honest behavior maximizes the total payoff of the two players: $(1+1 > 1+ g - l$ according to the assumption $g - l < 1$.

Table 1. The payoff structure of the PD game

		Buyer	
		Honest/Trust	**Cheat/Distrust**
Seller	**Honest/Trust**	1, 1	$-l$, $1+g$
	Cheat/Distrust	$1+g$, $-l$	0, 0

There have been proposed a number of different types of "solutions" for PD problems. We accept the four general categories of solutions addressed by James [38]: changing the preferences of players, writing an explicit contract, relying on an implicit social contract, and repeating the interaction**.**

4. Conclusions

Trust is earned over time, trust can be monitored by governments but not established by them and trust can take years to establish but can be lost in an instant [53]. Trust is a certain action, not just a feeling that just happens. It stems from the way we the people choose to interact. As Cofta [54] very wisely refers "the task discussed is not how to make people trust more but how to make them trust just enough - not too little and not too much". In terms of economics, trust is the most efficient mechanism for governing economic transactions, a public good, a social lubricant which makes possible production and exchange [55], [56].

References

[1] P. Hart and Z. Liu, "Trust in the preservation of digital information", *Communications of the ACM, 46(6),* 2003, pp. 93-97.

[2] S. Grabner-Krauter and E. Kaluscha, "Empirical research in on-line trust: a review and critical assessment", *Int. J. Human-Computer Studies*, 58, 2003, pp. 783–812.

[3] S. Grabner-Krauter (2002), "The Role of Consumers' Trust in Online-Shopping", *Journal of Business Ethics,* 39, pp. 43–50.

[4] A. Jøsang, "Trust-based decision making for electronic transactions", *Proceedings of the Fourth Nordic Workshop on Secure IT Systems (NORDSEC'99), Stockholm University Report 99-005*, 1999.

[5] D. Manchala, "Trust Metrics, Models and Protocols for Electronic Commerce Transactions", *Proceedings of the 18th International Conference on Distributed Computing Systems*, 1998

[6] P. McCole, "The role of trust for electronic commerce in services", *International Journal of Contemporary Hospitality Management*, 14(2), pp. 81-87, 2002.

[7] C. Bock, "The need for trust in electronic commerce in intellectual property", *World Patent Information, 21*, 1999, pp. 237-239.

[8] PricewaterhouseCoopers, E-Business A Matter of Trust, White Paper, 2001.

[9] P. Papadopoulou, A. Andreou, P. Kanellis, D. Martakos, "Trust and relationship building in electronic commerce", *Internet Research: Electronic Networking Applications and Policy, 11(4),* 2001, pp. 322-332.

[10] Zheng J., Veinott E., Bos N., Olson J., Olson G. (2002). Trust without touch, Proceedings of the SIGCHI conference on Human factors in computing systems, 4(1), 141-146

[11] T. Grandison and M. Sloman "Specifying and Analysing Trust for Internet Applications", *Proceedings of the IFIP Conference on Towards The Knowledge Society: E-Commerce, E-Business, E-Government*, 2002, pp. 145-157.

[12] L. Corritore, B. Kracher, S. Wiedenbeck, "Trust in the online environment", *International Journal of Human-Computer Studies, 58(6)*, 2001, pp. 1548-1552.

[13] K. Stewart and Y. Zhang, "Effects of hypertext links on trust transfer", *Proceedings of the 5th international conference on Electronic commerce, 50*, 2003, pp. 235-239.

[14] IBM Global Services, Deutsche Bank: Creating a trusted e-business infrastructure, 2001.

[15] N. Bos, J. Olson, D. Gergle, G. Olson, Z. Wright, "Effects of four computer-mediated communications channels on trust development", *Proceedings of the SIGCHI conference on Human factors in computing systems, 4(1)*, 2001, pp. 135-140.

[16] O. Lee and E. Turban, "A trust model for internet shopping", *International Journal of Electronic Commerce, 6 (1)*, 2001, pp. 75–91.

[17] A. Jones, "On the concept of trust", *Decision Support Systems, 33*, 2002, pp. 225– 232.

[18] K. Blois, "Trust in business to business relationships: an evaluation of its status", *Journal of Management Studies, 36(2)*, 1999, pp. 197-215.

[19] I. Lehti and P. Nikander, „Certifying Trust", *PKC'98, LNCS 1431*, 1998, pp. 83–98.

[20] L. Hosmer, "Trust: the connecting link between organizational, behavior and philosophical ethics", *Academy management Review, 20(2)*, 1995, pp. 370–403.

[21] I. Mezgár, "Role of trust in networked production systems", *Annual Reviews in Control, 27*, 2003, pp. 247–254.

[22] Y. Wang and H. Emurian, "An overview of online trust: Concepts, elements, and implications", *Computers in Human Behavior, 21*, 2005, pp. 105–125.

[23] M. Patton and A. Josang, "Technologies for Trust in Electronic Commerce", *Electronic Commerce Research, 4*, 2004, pp. 9–21.

[24] P. Ratnasingham, "The importance of trust in electronic commerce", *Internet Research: Electronic Networking Applications and Policy, 8(4),* 1998, pp. 313–321.

[25] D. Gefen, "Reflections on the dimensions of trust and trustworthiness among online consumers", *ACM SIGMIS Database, 33(3)*, 2002, pp. 38 – 53.

[26] E. Kim and S. Tadisina, "Factors Impacting Customers' Initial Trust in E-businesses: An Empirical Study", *Proceedings of the 38th Hawaii International Conference on System Sciences*, 2005.

[27] H. McKnight, V. Choudhury, C. Kacmar, "Trust in e-commerce vendors: a two-stage model", *Proceedings of the twenty first international conference on Information systems*, 2002, pp. 532-536.

[28] M. So and D. Sculli, "The role of trust, quality, value and risk in conducting e-business", *Industrial Management & Data Systems, 102(9)*, 2002, pp. 503-512.

[29] B. Shneiderman, "Designing trust into online experiences", *Communications of the ACM, 43(12),* 2000, pp. 57-59.

[30] P. Nikander and K. Karvonen, "Users and Trust in Cyberspace", *Lecture Notes In Computer Science, 2133*, pp. 24–35.

[31] C. Calcanis, D. Patel, S. Patel, "Trust Objects in Electronic Commerce Transactions", *Lecture Notes In Computer Science, 2425*, 2002, pp. 31-39.

[32] C. Eckela and R. Wilson, "Is Trust a Risky Decision?", *Journal of Economic Behavior and Organization, 55(4)*, 2004, pp. 447-466.

[33] D. Gefen, V.S. Rao, N. Tractinsky, "The Conceptualization of Trust, Risk and Their Relationship in Electronic Commerce: The Need for Clarifications", *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03)*, 2003.

[34] S. Daellenbach and J.S. Davenport, "Establishing Trust during the Formation of Technology Alliances", *Journal of Technology Transfer, 29*, 2004, pp. 187–202.

[35] H. Hummels and H. Roosendaal, "Trust in Scientific Publishing", *Journal of Business Ethics, 34*, 2001, pp. 87–100.

[36] D. Fetchenhauer and D. Dunning, "Do people trust too much or too little", *Journal of Economic Psychology 30*, 2009, pp.263–276.

[37] C. Ybarra and A.T. Turk, "The evolution of trust in information technology alliances", *Journal of High Technology Management Research, 20*, 2009, pp. 62–74.

[38] S. James Jr, "The trust paradox: a survey of economic inquiries into the nature of trust and trustworthiness", *Journal of Economic Behavior & Organization, 47*, 2002, pp. 291–307.

[39] K. Blomqvist, "The Many Faces. of Trust", *Scandinavian Journal of Management, 13(3)*, 1997, pp. 271-286.

[40] S. Ba, "Establishing online trust through a community responsibility system", *Decision Support Systems, 31*, 2001, pp. 323– 336.

[41] W. Chu and J. Dyer, "The Economic Value of Trust in Supplier-Buyer Relationships", Research Paper on International Motor Vehicle Program, 1997.

[42] F. Roth, "Does TooMuch Trust Hamper Economic Growth?", *KYKLOS, 62(1)*, 2009, pp. 103–128.

[43] R. Olsen, "Trust as risk and the foundation of investment value", *The Journal of Socio-Economics, 37*, 2008, pp. 2189–2200.

[44] M. Fritz and M. Canavari "Management of Perceived e-Business Risks in Food-Supply Networks: e-Trust as Prerequisite for Supply-Chain System Innovation", *Agribusiness, 24(3),* 2008, pp. 355–368.

[45] R. Lusch, M. O'Brien, B. Sindhav, "The critical role of trust in obtaining retailer support for a supplier's strategic organizational change", *Journal of Retailing, 79*, 2003, pp. 249–258.

[46] M. Ricketts, "Trust and economic organisation", *Economic Affair*, 2001, pp. 18-22.

[47] R. Handfield and C. Bechtel, "Trust, power, dependence, and economics: can SCM research borrow paradigms?, *International Journal of Integrated Supply Management, 1(1)*, 2004, pp. 3–32.

[48] I. Bohnet and R. Zeckhauser, "Trust, risk and betrayal", *Journal of Economic Behavior & Organization, 55*, 2004, pp. 467–484.

[49] S. Ba, A. Whinston, H. Zhang, "Building trust in online auction markets through an economic incentive mechanism", *Decision Support Systems, 35*, 2003, pp. 273– 286.

[50] G. Bolton, E. Katok, A. Ockenfels, "Trust among Internet Traders: A Behavioral Economics Approach", *Analyse und Kritik, 26*, 2004, pp. 185-202.

[51] G. Hagg, "The Economics of Trust, Trust-Sensitive Contracts, and Regulation", *International Review of Law and Economics, 14*, 1994, pp. 437-451.

[52] J. Riegelsberger, A. Sasse, J. McCarthy, "The researcher's dilemma: evaluating trust in computer-mediated communication", *Int. J. Human-Computer Studies,* 58, 2003, pp. 759–781.

[53] E. Fano, A. Mathur, B. Shah, "The Economic Value of Trust", *Outlook Journal*, 2003, pp. 32-41.

[54] R. Cofta, "Designing for Trust", *Handbook of research on socio-technical design and social networking systems*, vol. I, 2009, pp. 388- 401.

[55] A. Khan, "On trust as a commodity and on the grammar of trust", *Journal of Banking & Finance, 26,* 2002, pp. 1719–1766.

[56] P. Wilson, "The Economic Nature of Network Capital in B2B Transactions", *Agribusiness, 23(3)*, 2007, pp. 435–448.

Author

Theodosios Tsiakis is an Adjunct Lecturer in the Department of Economic Studies at University of Thessaly, Volos, Greece. He holds a PhD degree in Information Security Economics from the Department of Applied Informatics, University of Macedonia, Thessaloniki, Greece. His research interests include information security economics, risk, trust and human factors. He has published numerous articles in conference proceedings and journals.