

The Influence of Culture on Decision Making in Trade

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Goal:

To simulate trade agents that display believable culturally differentiated behavior in trade processes.

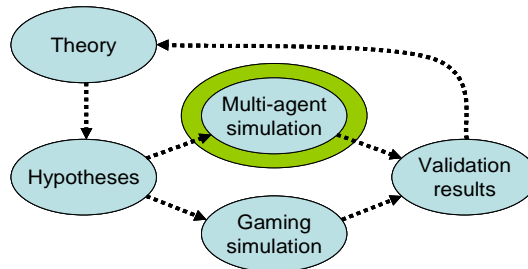
Approach:

Model agent behavior in a human gaming simulation and validate multi-agent simulation results against games.

Foundations:

- Transaction cost economics (Williamson)
- Dimensions of national culture (Hofstede)

Research approach



Transaction cost

is associated with the activities for:

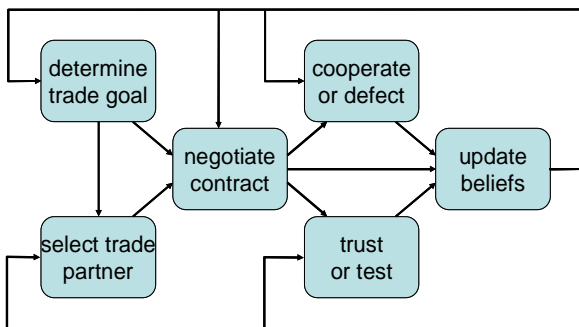
- searching
- bargaining
- contracting
- monitoring
- enforcing

National culture

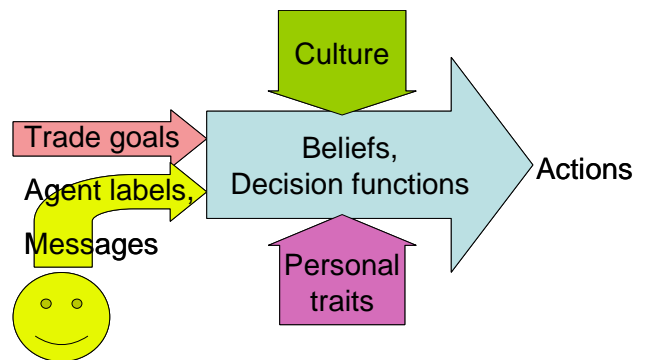
has dimensions:

- individualism versus collectivism
- power distance
- masculinity versus femininity
- uncertainty avoidance
- long versus short term orientation

A trading agent's processes



Trading agents perform processes in which they base their decisions on experience-updated beliefs, e.g. about market price and about fairness and trustworthiness of partners.



Agents act upon given trade goals and messages from and observable characteristics (labels) of other agents. Cultural background and personal traits effect their beliefs and decisions.

Example of results: simulated transaction rate between in-group relations in societies of collectivistic and individualistic agents; collectivists trade with all in-group members, while individualists develop trusted partnership relations.

col	C1	C2	C3	C4	ind	C1	C2	C3	C4
S1	5	6	6	6	S1	3	2	24	0
S2	8	3	5	6	S2	1	0	0	12
S3	5	7	5	8	S3	0	16	1	2
S4	8	7	5	4	S4	14	2	0	7

Possible applications:

- Social sciences
- Training and education
- Negotiation support

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Abstract

Misunderstandings arise in international trade due to difference in cultural background of trade partners. Trust and the role it plays in trade are influenced by culture. Considering that trade always involves working on the relationship with the trade partner, understanding the behaviour of the other is of the essence. This presentation proposes to involve cultural dimensions in the modelling of trust in trade situations.

When playing trading games with people from different parts of the world, different patterns of trade and trust emerge [1]. This presentation focuses on the influence of culture on traders' decision making. Hofstede's theory [2] forms the basis of our analysis. We first discuss dimensions of national culture, and then we show how decision rules for the trading agents are affected by culture. The model of trade processes is based on transaction cost economics [3]. It involves the processes of searching, bargaining, contracting, monitoring, and enforcing of contracts.

Traders' perceptions, beliefs and decisions are influenced by cultural background. In the process of searching, culture sets preferences and limits to whom to do business with, and sets protocols for the way to open negotiations. When bargaining, culture defines what behavior is acceptable and what the role of personal relations and status differences is. The level of detail, conditions, and guarantees of contracts differ considerably across the world. So does the extent to which it is acceptable to use an opportunity to defect. Monitoring a contract and explicitly showing distrust is interpreted as an offense in some parts of the world, but is usual in other parts. When enforcing contracts, some cultures are more forgiving than others.

Trust plays an important role in trade processes. However, it does not work in the same way across cultures. For instance, in some societies the emphasis is on interpersonal trust based on kinship; in others it is on interpersonal trust based on other markers; yet in others it is in impersonal institutions such as certification or law. Gorobets [4] demonstrated on the basis of a multi-agent simulation that economic systems based on trust as well as systems based on opportunism may be viable in different societies.

Our work analyses the influence of culture on trade for each of Hofstede's dimensions, and formulates a set of rules for implementation in trading agents [5, 6, 7, 8, 9]. With respect to trust, the rules work out at two levels. First, the relevance of trust based on experience or

reputation may be different across cultures; in some cultures family relations, xenophobia, or status differences may have much stronger influence than trust. Second, the effects of partner's behavior on trust may be different across cultures.

Results of simulations were verified at the macro level. Validation through combining human gaming and multi-agent simulations is one subject of current research [10].

Possible application areas are:

- research in the social sciences, for instance development of trade networks and efficiency of institutional arrangements,
- training and education, for instance in business schools and firms trading internationally,
- negotiation support systems, that advise their users about inventory of preferences and interpretation of partner's bids and appropriate replies.

References

- [1] S.Meijer, G.J.Hofstede, G.Beers, S.W.F.Omta, 2006. Trust and Tracing game: learning about transactions and embeddedness in a trade network. *Production Planning and Control* 17: 569-583.
- [2] G.Hofstede, 2001. *Culture's Consequences, second edition*. Sage Publications, Thousand Oaks.
- [3] O.E.Williamson, 1998. Transaction Cost Economics: how it works, where it is headed. *De Economist* 146 (1): 23-58.
- [4] A.Gorobets, B.Nooteboom, 2006. Agent Based modeling of Trust Between Firms in Markets. In C.Bruun. *Advances in Artificial Economics. LNEMS 584*: 121-132. Springer-Verlag.
- [5] G.J.Hofstede, C.M.Jonker, S.Meijer, T.Verwaart, 2006. Modelling Trade and Trust across Cultures. In K.Stølen et al. *Trust Management: 4th International Conference, iTrust 2006, LNCS 3968*: 120-134. Springer-Verlag.
- [6] G.J.Hofstede, C.M.Jonker, T.Verwaart, 2008. Modeling Culture in Trade: Uncertainty Avoidance. In *Proceedings of 2008 Agent-Directed Simulation Symposium (ADS'08)*. SCS, San Diego.
- [7] G.J.Hofstede, C.M.Jonker, T.Verwaart, 2008. Modelling Power Distance in Trade. In *9th International Workshop on Multi-Agent-Based Simulation (MABS 2008)*, LNAI 5269. Springer-Verlag.
- [8] G.J.Hofstede, C.M.Jonker, T.Verwaart, 2008. Individualism and Collectivism in Trade Agents. In N.T.Nguyen et al., *New Frontiers in Applied Artificial Intelligence, IEA/AIE 2008, LNAI 5027*: 492-501. Springer-Verlag.
- [9] G.J.Hofstede, C.M.Jonker, T.Verwaart, 2008. Long-term Orientation in Trade. In K.Schredelseker and F.Hauser, *Complexity and Artificial Markets, LNEMS 614*: 107-118. Springer-Verlag.
- [10] D.Tykhonov, C.Jonker, S.Meijer, T.Verwaart, 2008. Agent-Based Simulation of the Trust and Tracing Game for Supply Chains and Networks. *JASSS* 11 (3): 1. <<http://jasss.soc.surrey.ac.uk/11/3/1.html>>

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