Electronic markets on transaction costs

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Dear readers,

This first general research issue in volume 27 of *Electronic Markets* gives us the opportunity to reflect on a general theoretical perspective that has become important for the field of electronic markets and networked business. In fact, it has been exactly eighty years since the influential paper on transaction cost economics (TCE) appeared from Coase (1937) and exactly thirty years since the seminal paper on electronic markets and hierarchies was published by Malone et al. (1987). The latter was among the first to link TCE with the potentials of information technology (IT) and to argue for a negative impact of IT on transaction costs. This line of argument recognizes that transaction costs have become a powerful instrument within economic theory, which has contested traditional, i.e. neoclassical, positions in favor of a more realistic view on economic processes within the field of so-called institutional economics. This understanding follows the belief that neither economic actors are fully rational nor are products homogeneous or market processes free of cost. It challenges the assumption that equilibrium prices are formed in real-time and conceives transaction costs as costs of using the market. In this sense, transaction costs are viewed “as the economic equivalent of friction in a physical system” (Wigand 1997, p. 8). According to TCE, organizations (or hierarchical structures) will grow as long as the costs of conducting a transaction internally (e.g. via employing people for manufacturing in-

stead of buying products) are lower than the cost of conducting a similar transaction in the market.

TCE introduced three elements that have also become important for understanding the impact of IT on markets. First, transaction costs originate from human and environmental factors (Williamson 1975). Among the human sources of transaction costs are bounded rationality and opportunism. This means that economic actors only possess incomplete information on the market and limited ability to process this information as well as the outcomes of their activity. They also pursue own interests, which may be opportunistic in nature. Environmental factors in turn do not affect the actors, but the characteristics of the transaction. These factors comprise the specificity of the respective asset (i.e. product), the frequency of the transaction as well as the uncertainty of events, which actors may anticipate or not. Second, the friction caused by transaction costs is due to “costs of negotiating, monitoring and governing exchanges between people” (Williamson 1975, p. 20). These activities may be used to structure a transaction into various cost categories and chronological phases. In this vein, search, contracting, monitoring and adaption costs may be distinguished (Wigand 1997, p. 8). This means that transaction costs are broad in nature and cover all material and immaterial expenditures involved in a transaction. Thus, transaction costs are not limited to shipping or transaction fees that are commonly charged by e-commerce or payment providers. Third, TCE provides a differentiation between alternative structures to govern a transaction. These were primarily derived from contract theory and led to the formulation of the three structural archetypes markets, hierarchies and hybrids. Each governance structure may be compatible for a certain level of human and environmental factors, which helps in assessing suitable governance structures.

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IT and TCE

IT has an important impact on all three TCE elements. First, IT may be used to influence human and environmental factors. More information from the (electronic) market may, for example, become available as well as processible in big data initiatives, and data from other actors in the market may be used to increase trust and to reduce opportunism. As argued by Malone et al. (1987), IT may also be applied to reduce the complexity of product descriptions as well as the specificity of transactions. Second, the transaction phases are to a large portion information-based, which, depending on the materiality of the product, makes them amenable for IT. Again, the more a transaction's ingredients are IT-based, the stronger transaction costs will be reduced for this transaction. Three effects are known to be responsible for lower transaction costs (Malone et al. 1987, p. 3): an electronic communication, an electronic integration, and an electronic brokerage effect. Regarding the third element, IT may cause changes in governance structures. Two directions are well known in this respect: one is referred to as “move to the market” or the “electronic market hypothesis” (EMH) and expects that reduced transaction costs favor the use of market mechanisms. Another is called “move to the middle” or the “strategic networking effect” (SNE) (Wigand 1997, p. 3) and posits that IT helps organizations to forge closer relationships with external partners.

Remarkably, there is confirmation for both effects. Following the survey from Glassberg (2007), it depends whether customer- or business-oriented transactions are affected. While in the Business-to-Customer (B2C) and the Customer-to-Customer (C2C) domain, price and cost serve as primary elements of a transaction, the picture is different in the Business-to-Business (B2B) arena, where IT is found to manage relationships and not individual transactions. This means that the EMH was mainly supported for customer-oriented transactions, where the last two decades have demonstrated a transformation of retailing and selling. Also termed as e-business, it comprises a convergence of the three development paths Enterprise Resource Planning (ERP), Interorganizational Systems (IOS) and Internet (Alt and Zimmermann 2015) that may also be conceived as enablers of reduced transaction costs. For example, multimedia and mobile IT have allowed more complex product descriptions to be handled via electronic channels and entire transactions to be conducted, from selecting and comparing products to contracting, payment, logistics and returns management. Asset specificity was, for example, reduced with mass customization (e.g. via configurators) and on demand (e.g. via 3D printing) strategies as well as more sophisticated settlement systems (e.g. electronic payment systems for micro-payments, logistic solutions for perishable goods). This confirms the expectation of Kalakota (2003, p. 9), that digitization (or e-

business) represents “a complex combination of multi-channel process thinking, cross-enterprise integration, and business technology.”

Electronic channels are more attractive to customers (or consumers) since they offer reduced transaction costs. Multiple business models have emerged and complemented existing retailers. Three categories shall be mentioned: 1. electronic dealers, such as Amazon, that take possession of the goods, 2. electronic brokers, such as Booking, who more or less “only” mediate transactions, and 3. meta-search engines, such as Trivago or Shopping (now part of Ebay), which support comparison shopping in the search phase and refer to respective providers for completing transactions. Again, research has confirmed that transaction costs are not equal to product or shipping costs. For example, a survey of book and CD prices (Brynjolfsson and Smith 2000) revealed that it is not the retailers with the lowest prices that have the most sales. Instead, immaterial factors, such as ease of use or familiarity with the retailer, were found to be important as well. This suggests that the overall transaction costs for the consumer were lower although the processes involved in e-commerce transactions (e.g. in coordination and logistics) might have been more complex. Another example for the impact of reduced transaction costs is the emergence of C2C transactions and of the entire sharing economy (Puschmann and Alt 2016). Electronic auction sites, such as Ebay, facilitated transactions among consumers (C2C) that would involve too high transaction costs in traditional channels (e.g. newspapers). Similarly, the ideas of usage instead of possessing goods or service digitization (Kalakota 2003) are based on coordination efforts, which were not feasible before. Leading companies in this field, such as Uber and Airbnb, have meanwhile grown to unicorn companies.

Contrary to customer-oriented processes, the application of TCE for transactions in the business world (B2B) shows the SNE effect to dominate in this context. This is mainly attributed to more specific requirements, a higher relevance of trust, the need for managerial skills, reputation and quality as well as the improved abilities to share costs and risks (Glassberg 2007). Although TCE has been instrumental in explaining parts of outsourcing and the networking among companies, the B2B domain has shed light on the shortcomings of TCE. While transaction cost is regarded as difficult to operationalize (e.g. Cordella 2006), the strong focus on cost – “cost is only one factor that drives firms to choose one market structure over another” (Glassberg 2007, p. 54) – at the same time neglects non-cost aspects that are more relevant in the B2B domain. Interestingly, the Journal of Strategic Information Systems recently selected a paper on this topic for the best paper award 2016 (Schermann et al. 2016). Following this argumentation, the advances in IT outsourcing (ITO) tools and skills (e.g. standardized services for defining and monitoring service levels as well as trust enhancing technologies,

such as Blockchain (Economist 2015)) have decreased the costs for negotiation, monitoring and renegotiation costs. The incentives in ITO have shifted “the intent for both vendors and clients from improving the efficiency of ITO transactions to developing value-creating relationships” (Schermann et al. 2016, p. 40). In line with Glassberg (2007) they call for new approaches and models that take value creating aspects into account, such as relational flexibility, that have also been referred to as non-contractible issues (Bakos and Brynjolfsson 1993).

In summary, the potentials, limitations and perspectives of TCE also prove valuable for explaining today’s phenomena. Figure 1 visualizes some aspects for B2B and B2C transactions based on Picot (1986). It starts on the right hand side where customers (or consumers) purchasing a certain good are confronted with total costs that consist of the purchase price (including shipping fees) and the transaction costs for searching the offering and completing the transaction. Electronic services, such as meta-search engines or broker platforms, may reduce the transaction costs and eventually also lead to cheaper offerings, thus reducing the product price from a to b. Note that since neither the meta-search nor the broker company takes possession of the goods the respective product prices are shown in dotted lines. If the meta-search provider does not directly refer to the provider and links to a broker or a dealer, his production (or operating) costs and his transaction costs need to be taken into account, which requires that he is able to purchase the goods at the lower price c instead of d. This supposes that dealers and brokers also incur

production and transaction costs themselves. Finally, providers (or manufacturers) purchase from their suppliers at price e and again add their production and transaction costs to the (sub) product price. While IT effects may also occur in this B2B domain, following the argumentation above, relational components are expected to dominate here compared to price. We therefore would like to encourage researchers to not only apply TCE for explaining their findings, but also to contribute to further advancing TCE elements and concepts. Due to the close link of TCE to networked business, Electronic Markets is a journal that always welcomes such research.

Special issue articles

In fact, there are links of TCE to the contributions of this general research issue, which comprises a total of six papers and, sadly, one obituary. The first paper may be conceived as an extension of TCE thinking. Titled “Customer lifetime network value: customer valuation in the context of network effects” Miriam Däs, Julia Klier, Mathias Klier, Georg Lindner and Lea Thiel present an approach that emphasizes the networked nature of transactions and the influence of social networks. Their customer lifetime network value model introduces an integrated network perspective, which convincingly includes the social influence in the measurement of customer value (Däs et al. 2017). The two following papers both target product

Fig. 1 Transaction costs and intermediation in a supply chain

returns, which have become a key challenge in the settlement phase of e-commerce transactions. The first paper investigates the relationship between product returns and customer satisfaction, trust and positive word-of-mouth. The authors Gianfranco Walsh and Daniel Brylla ask the question “Do product returns hurt relational outcomes?” and, based on a panel from customers of eight online retailers, they offer findings for positively answering this question (Walsh and Brylla 2017). The second is a separate research study by the same author. Together with Michael Möhring, Gianfranco Walsh provides empirical evidence for the “Effectiveness of product return-prevention instruments”. The authors discuss three instruments (money-back guarantee, free return labels, product reviews) and their suitability for preventing product returns. They conclude that money-back guarantees tend to increase, and product reviews tend to decrease, while free return labels are neutral regarding their influence on customer product returns (Walsh and Möhring 2017).

The fourth contribution may be associated with the search and contracting phase of a transaction. Using data from internet searches, the authors Jukka Ruohonen and Sami Hyrynsalmi are “Evaluating the use of internet search volumes for time series modeling of sales in the video game industry” (Ruohonen and Hyrynsalmi 2017). Their findings are critical, since these search volumes are regarded as valuable sources on the one hand, but the forecasting improvements are rather incremental especially when benchmarked against well-established diffusion models on the other. The fifth paper also has a link to a transaction’s search phase and investigates the relationship between an individual’s number of contacts in social networks and the success of obtaining job offers. In “Getting a job via career-oriented social networking markets”, Ricardo Büttner (2017) describes how too many contacts (or ties) negatively affect job search success and identifies the “magic” figure of 157. The influence of data on transaction cost is also a topic in the sixth paper. In particular, data quality may be conceived of as a source of transaction costs besides bounded rationality, opportunism and uncertainty (Anding and Hess 2002). In this vein, Dominikus Kleindienst presents “The data quality improvement plan” and investigates how an optimal sequence of data quality improvements may be determined. These improvements include filtering data to improve the timeliness of data, buying additional data to improve completeness of data and consistence checks to improve the consistency of data. A decision model is proposed that considers inter-relationships between the impacts on the various data quality dimensions (Kleindienst 2017).

Finally, our senior editor Rolf Wigand devotes an obituary to Arnold Picot, who not only was a board member of Electronic Markets since 1999, but who also was one of the pioneering scholars on TCE in the organizational context.

“Remembering Arnold Picot” presents a thoughtful and thankful summary of his life and his impressive achievements (Wigand 2017). On behalf of Electronic Markets we are grateful for his contributions to our journal and wish to dedicate this issue to him.

Your EM-team.

References

- Alt, R., & Zimmermann, H.-D. (2015). Editorial 25/3: electronic markets on ecosystems and tourism. *Electronic Markets*, 25(3), 169–174. <https://doi.org/10.1007/s12525-015-0197-7>.
- Anding, M., & Hess, T. (2002). Online content syndication – a critical analysis from the perspective of transaction cost theory. Proceedings European Conference on Information Systems (ECIS 2002), 551–563. <http://aisel.aisnet.org/ecis2002/86>.
- Bakos, J. Y., & Brynjolfsson, E. (1993). Information technology, incentives and the optimal number of suppliers. *Journal of Management Information Systems*, 10(2), 37–53. <https://doi.org/10.1080/07421222.1993.11517999>.
- Brynjolfsson, E., & Smith, M. D. (2000). Frictionless commerce? A comparison of internet and conventional retailers. *Management Science*, 46(4), 63–585. <https://doi.org/10.1287/mnsc.46.4.563.12061>.
- Büttner, R. (2017). Getting a job via career-oriented social networking markets – the weakness of too many ties. *Electronic Markets*, 27(4). doi:<https://doi.org/10.1007/s12525-017-0248-3>.
- Coase, R. H. (1937). The nature of the firm. *Economica*, 4(16), 386–405. <https://doi.org/10.1111/j.1468-0335.1937.tb00002.x>.
- Cordella, A. (2006). Transaction costs and information systems: does IT add up? *Journal of Information Technology*, 21(3), 195–202. <https://doi.org/10.1057/palgrave.jit.2000066>.
- Däs, M., Klier, J., Klier, M., Lindner, G., & Thiel, L. (2017). Customer lifetime network value: customer valuation in the context of network effects. *Electronic Markets*, 27(4). <https://doi.org/10.1007/s12525-017-0255-4>.
- Economist (2015). The trust machine. *Economist*, Oct 31. <https://www.economist.com/news/leaders/21677198-technology-behind-bitcoin-could-transform-how-economy-works-trust-machine>. Accessed 14 Oct 2017.
- Glassberg, B. C. (2007). Electronic markets hypothesis redux: where are we now? *Communications of the ACM*, 50(2), 51–55. <https://doi.org/10.1145/1216016.1216020>.
- Kalakota, R. (2003). *Services blueprint: roadmap for execution*. Boston etc: Addison-Wesley.
- Kleindienst, D. (2017). The data quality improvement plan: deciding on choice and sequence of data quality improvements. *Electronic Markets*, 27(4). doi:<https://doi.org/10.1007/s12525-017-0245-6>.
- Malone, T. W., Yates, J., & Benjamin, R. I. (1987). Electronic markets and electronic hierarchies. *Communications of the ACM*, 30(6), 484–497. <https://doi.org/10.1145/214762.214766>.
- Picot, A. (1986). Transaktionskosten im Handel. *Der Betriebsberater*, 41(27), 1–16.
- Puschmann, T., & Alt, R. (2016). Sharing economy. *Bus Inf Syst Eng*, 58(1), 93–99. <https://doi.org/10.1007/s12599-015-0420-2>.
- Ruohonen, J., & Hyrynsalmi, S. (2017). Evaluating the use of internet search volumes for time series modeling of sales in the video game industry. *Electronic Markets*, 27(4). doi:<https://doi.org/10.1007/s12525-016-0244-z>.
- Schermann, M., Dongus, K., Yetton, P., & Krcmar, H. (2016). The role of transaction cost economics in information technology outsourcing

- research: a meta-analysis of the choice of contract type. *Journal of Strategic Information Systems*, 25(1), 32–48. <https://doi.org/10.1016/j.jsis.2016.02.004>.
- Walsh, G., & Brylla, D. (2017). Do product returns hurt relational outcomes? Some evidence from online retailing. *Electronic Markets*, 27(4). doi:<https://doi.org/10.1007/s12525-016-0240-3>.
- Walsh, G., & Möhring, M. (2017). Effectiveness of product return-prevention instruments: empirical evidence. *Electronic Markets*, 27(4). doi:<https://doi.org/10.1007/s12525-017-0259-0>.
- Wigand, R. T. (1997). Electronic commerce: definition, theory, and context. *The Information Society*, 13(1), 1–16. <https://doi.org/10.1080/019722497129241>.
- Wigand, R.T. (2017). Remembering Arnold Picot. *Electronic Markets*, 27(4). doi:<https://doi.org/10.1007/s12525-017-0266-1>.
- Williamson, O. E. (1975). *Market and hierarchies: Analysis and antitrust implications*. New York: Free Press.