

Solutions **Chapter 2: Theoretical Concepts Relevant for Supply Chain Management Accounting**

Review question 2.1:

Theories of SCMAC help explain:

- why and how firms define their boundaries towards other entities,
- why different economic entities collaborate with each other, and
- which phenomena are relevant in inter-organizational collaboration.

A practitioner is well-advised to become familiar with relevant theoretical concepts and ideas that have been developed, discussed and tested.

1. They help to find and to implement the most appropriate setup for a collaboration across supply chain partners and provide hints for business actors (instrumental perspective),
2. They provide the conceptual basis for explaining the different institutional arrangements (direct competition, alliances, joint ventures, vertical collaboration, etc.) that can be found between firms in modern economies (explanatory perspective).

Once we understand the motives and the driving factors behind a particular institutional arrangement – such as collaboration along the supply chain – we are better equipped for managing this arrangement.

Review question 2.2:

Neoclassical theorists consider the market as the most important – if not the only – mechanism for efficient resource allocation. In neoclassical thinking, actors are driven by their pursuit of maximizing individual benefit. It is the price mechanism that guarantees that resources are allocated to their most efficient use: a resource will be purchased by that party that can generate the highest individual benefit when employing it.

Neoclassical theory is based on a number of (simplifying) assumptions:

- The right input mix for each output is known. Economists refer to “production functions”.
- The marginal contribution (marginal benefit) of inputs is known.
- Information on inputs, prices and possible resource benefits is available to all market actors.
- Resources are not limited and there is always a price available on the market.

In a neoclassical world, firms remain black boxes that engage in individual market transactions but have no need for other governance schemes such as inter-firm collaboration. In neoclassical economics, there is no need and thus no justification for supply chains.

Review question 2.3:

Transaction costs occur whenever goods or services are transferred between institutional or organizational units. These units might be part of the same, bigger organizational entity (e.g. different departments within the same company) or might belong to separate organizations (e.g. two companies trading with each other at market terms). The central question of transaction cost theory is whether a transaction is more efficiently performed within a firm (vertical integration) or outside it, by autonomous market contractors. Transaction costs can be viewed as an efficiency indicator of transactions: the lower the transaction costs, the more efficient a specific transaction is. According to Transaction Cost Theory, transaction costs cannot be entirely avoided. The central tenet of TCE is that actors should always try to identify the most efficient governance mode for a particular activity or transaction, i.e. the one option that entails minimum transaction cost.

Review question 2.4:

The central question of transaction cost theory is whether a transaction is more efficiently performed within a firm (vertical integration) or outside it, by autonomous market contractors. According to TCE, transaction cost cannot be entirely avoided, because economic actors are always faced with two fundamental constraints:

bounded rationality and opportunism.

Although still seeking for individual profit maximization, actors possess “bounded rationality” only (as opposed to complete rationality), because they cannot foresee all potentially influencing factors and contingencies in a given situation. Actors are not fully informed about what might happen in the future and what (potentially opportunistic) behavior their transaction partners will show. In order to limit the negative consequences of this uncertainty, parties typically engage in contractual relationships. The more effort is put into preparing and enforcing contracts, the higher transaction costs will be.

The central tenet of TCE is that actors should always try to identify the most efficient governance mode for a particular activity or transaction, i.e. the one option that entails minimum transaction cost. TCE guides the choice between market transaction or internal task completion (governed by hierarchical relationships). The more pronounced these factors are, the closer a given situation is to “market failure”, which in turn suggests that internal task completion is more efficient than a market transaction. TCE has identified the following characteristics:

1. **Asset specificity:** Some resources are easily obtainable in the market. You can find numerous suppliers that offer the same product or service and its features are quite homogeneous. In contrast, other assets may be tailored to a specific transaction or business relationship. Such transaction-specific assets cannot be easily redeployed in other activities or transactions. They provide benefits only in the particular transaction or business relationship that they have been designed for. In a market environment, such a situation opens the way for opportunistic behavior. In addition, replacing the asset will not be easily possible, since the specific resource is not offered by other market participants – it’s not available in the market. TCE, therefore, suggests that in such a situation, the firm will revert to vertical integration and perform the activity in-house. The hierarchical authority structures inside the company provide much better safeguarding against opportunistic behavior than market contracts.
2. **Uncertainty:** Uncertainty mostly stems from a lack of information. Uncertainty (lack of information) can refer to environmental conditions as well as to partners’ performance. The resulting ambiguity will increase transaction costs (specifying very detailed contracts, setting up and running complex monitoring systems, engaging in frequent information exchange meetings, etc.). Similar to a situation with high asset specificity, a firm will tend to perform tasks and activities in-house, if they are linked to high environmental or behavioral uncertainty, respectively. TCE posits that hierarchical governance schemes are more appropriate in such situations than market exchange.
3. **Transaction frequency:** This refers to the extent to which transactions recur. Transaction frequency provides an incentive for firms to employ hierarchical governance because the overhead cost of hierarchical governance will be easier to recover for recurring transactions. The more often a particular task or activity is performed, the more sense it makes to take care of it oneself.

TCE can explain why firms choose different institutional arrangements for their economic activities, i.e. why they perform certain activities in-house, while they rely on outside partners in other cases.

Review question 2.5:

TCE addresses outsourcing analyses and make-or-buy decisions. Management accounting must support decision making in these fields. Although they might not be labeled as such (but rather be called “process cost” or “overhead”), transaction cost constitutes a major factor in such analyses. Management accountants, therefore, must develop an adequate tool set to identify and measure these cost items as well as integrate them into the decision making in their organization. At a supply chain level, this task does not change as such, but is merely transferred to a higher complexity level.

No matter what the institutional arrangement for a particular transaction looks like – TCE posits that reducing transaction costs will help spur business activities. SCMAC must work towards minimizing transaction costs both for intra- and inter-firm transactions, thus increasing efficiency of the firm’s activities and opening the way for entirely new business models. SCMAC should be able to identify the factors driving transaction costs in specific circumstances and transaction types since this is a prerequisite to increasing efficiency. SCMAC should develop adequate routines, instruments, and measures to assess and allocate transaction costs to their causal factors and economic agents, respectively. To conclude, while supply chains can help minimize transaction

costs, SCMAC must identify and manage the factors driving them (asset specificity, uncertainty, transaction frequency).

Review question 2.6:

The central tenet of RBT is that it is a firm's access to unique, non-imitable resources that defines its competitive position. However, the pure possession of valuable resources is not sufficient to generate a competitive advantage. Firms must also manage these resources effectively. Also, non-physical resources often provide bigger competitive advantages than physical resources, since they are more difficult to imitate or substitute. When collaborating in a supply chain, both aspects play an important role. A firm's resource portfolio needs to be optimized (acquiring, accumulating/developing, and divesting resources), and the potential of a valuable resource base must be leveraged through effective strategies. Collaboration in a supply chain can be viewed as a joint attempt to leverage resource advantages. If each partner contributes its own unique and inimitable resources, the entire supply chain will profit and improve its competitive position – a win-win situation for all partners. Teaming up in supply chains is a natural step for firms, if they can not acquire missing resources through other means or imitate the resources of their competitors.

Review question 2.7:

Collaboration can be a source of new competitive advantage by creating "relational resources" that are unique and (almost by definition) inimitable by competitors – since they are excluded from that cooperative network. Trade partners who deal with each other "at arm's length" only, forego potential benefits that collaborative supply chain partners can profit from (e.g. by mutually exchanging information that is important for the partner's planning tasks or by replacing lengthy contracts with trust, therefore lowering transaction costs).

However, such potential benefits are not a guarantee for competitive advantage. In order to truly leverage these relational resource benefits, supply chain partners need to manage their activities and resources properly. It takes professional supply chain management to profit from potential resource advantages. Effective and efficient supply chain management can integrate supply chain partners' resource contributions into a true competitive advantage that is beneficial for each supply chain member.

This logic has not remained undisputed. One might argue that many activities along a supply chain do not depend on inimitable and non-substitutable resources. Many practices are simply "good management": just-in-time principles, kanban, lot size reduction, employee involvement, statistical process control, supply chain collaboration, et cetera. These practices have proven valuable in numerous empirical studies, but the RBT would predict that these practices do not lead to sustained competitive advantage since every firm can implement them.

Supply chain collaboration can do more than just improve the efficiency and effectiveness of operational tasks. Collaboration is not only "output-oriented" but also "learning-oriented". Being part of a supply chain opens the opportunity to access another firm's core competencies through cooperation as an alternative to building such competencies in-house (Haakansson et al., 1999). Even if it might not be evident in daily operations, a supply chain can be a powerful relational resource.

Review question 2.8:

According to agency theory three different types of problematic situations exist:

1. Hidden characteristics: This describes a situation in which a principal doesn't know some important characteristics of the engaged agent. The agent conceals traits, capacities or qualities. The principal may find out – but this happens at a time when a contract has been made already. Thus, it is too late to decide for another agent. This problem may occur, for instance, when contracting a supplier that has hidden quality issues with its products or solvency problems (financial distress).
2. Hidden action and hidden information: In these types of situations, a principal is not able to observe all the actions of the agent. The principal cannot monitor or control all activities of agents due to lack

of time or physical distance between the two parties. A variant of hidden action is hidden information. This is a situation in which the principal might be able to observe the actions of an agent, but is incapable of understanding or evaluating them. In a supply chain context, a customer may have to blindly rely on the quality promises of a supplier. The risk that agents abuse information asymmetry opportunistically is called the 'moral hazard' problem in agency theory.

3. Hidden intention: The third type is a situation in which principals – in contrast to the other two - can even observe and judge the detrimental actions of the agent. However, the principal is not able to prevent them. The true intentions of the agent weren't visible to the principal ex-ante. Now, he is not in a position to sanction the adverse actions and force the agent to loyal behavior. This is called a 'hold up' in agency theory and typically occurs in business practice when one party is dependent on another. Examples are manifold in supply chain practice. A supplier who is dependent on a large customer might be exposed to ever-increasing price pressure. At the same time, a customer may be dependent on a single supplier who is the only one in the market who can deliver the required quantities and quality.

Review question 2.9:

The critical issue in avoiding or mitigating agency problems is to clearly identify the specific characteristics of the particular relationship (i.e. degree of information asymmetry, goal conflicts, opportunities for opportunism, etc.) and then choose the most efficient combination of outcome-based and behavior-based management mechanisms.

In order to avoid agency problems, a principle can undertake activities prior to making a contract with an agent. A principal can invest in mechanisms to select the right agent for his purposes:

1. Screening: Principals can try to collect as much information as possible about a potential contract partner prior to entering in a contract. An example is obtaining references before contracting a supplier.
2. Self-selection: Principals can try to detect hidden characteristics of agents by offering differentiated contract proposals. For example, a car manufacturer could offer two contract options: one with higher purchase prices but involving high penalties in case of a suspension of deliveries and one with less favorable purchase conditions but at the same time low penalties. A supplier who would consider himself of higher risk would probably reveal his true characteristics by choosing the second option.

Mitigating the agency problem after a contract has been made, i.e. during the collaboration with an agent, deals mainly with the question of how to align the interests of the agent with the interests of the principal. There are two general types of mechanisms that can be used to manage agency relationships:

1. Outcome-based management mechanisms: both the principal and the agent can observe outcomes, and the principal rewards the agent based on measured performance outcomes. For instance, a manufacturer may incentivize the supplier for reaching a defined level of delivery reliability. This would incentivize the supplier to strive for the desired results as defined by the manufacturer. Outcome-based management compensation emphasizes results regardless of how the agents achieve them.
2. Behavior-based management mechanisms: the principal introduces behavioral controls to monitor the agent's behavior and efforts to complete the task. For instance, a manufacturer may define a technical standard for data exchange between the trading partners in the supply chain. Behavior-based mechanisms emphasize the task and the processes performed by the agent, which (when followed) lead to the outcome desired by the principal.

Exercise 2.1:

Your company has been doing business with one of your major suppliers for several years. The business relationship is good but has never gone beyond formal purchasing frame contracts. The supplier's management has now changed and the new management team has approached your company with a business proposal to

jointly develop a new product, which would be based on an innovative technology patented by the supplier. The supplier hopes to tap a new business area, while your own company could solidify its competitive position in the market.

Analyze this situation using the theoretical concepts outlined in this chapter. Which opportunities and challenges will this new cooperative relationship entail and how can your company best cope with them?

The situation can be characterized using the theoretical frameworks presented in the chapter:

1. Neoclassical theory: the neoclassical model does not provide satisfying answers to the given situation. The firm would simply acquire the product in a perfect market and there is no need for collaboration beyond a pure market transaction.
2. With transaction cost economics (TCE), the situation can be analyzed by identifying the three criteria of market failures: asset specificity, uncertainty, and transaction frequency.
 - Regarding (a) asset specificity, the manufacturer wants to utilize the innovative technology of the supplier. It cannot be easily acquired in the market. The supplier is the only one offering the product. Such a situation opens the way for opportunistic behavior for both sides. The supplier may demand exorbitant prices, knowing that it is the only supplier of this technology. Replacing the asset will not be easily possible since the specific resource is not offered by other market participants – it's not available in the market. In turn, once the product has been jointly developed, the manufacturer may abuse the situation: knowing that the partner's asset is (almost) worthless outside of the current business relationship, the manufacturer, may be tempted to ask for better terms and conditions than originally agreed upon. TCE suggests that in such a situation, the manufacturer and the supplier should vertically integrate (merging or one acquires the other).
 - Regarding the second criterion, the situation is characterized by a high degree of (b) uncertainty. Neither the customer nor the supplier can assess and foresee the influencing factors that might affect the business relationship in the future (the relationship has never gone beyond formal purchasing frame contracts, there is a new management team). The firms cannot easily measure and verify the partners' performance (because a task is jointly completed and individual contributions cannot be easily separated). The resulting ambiguity will increase transaction costs (specifying very detailed contracts, setting up and running complex monitoring systems, engaging in frequent information exchange meetings, etc.). Similar to a situation with high asset specificity, according to TCE, the manufacturer will tend to perform the project preferably in-house.
 - Regarding transaction frequency, the setting features a one-time project. TCE suggests to vertically integrate only in case of recurring transactions.
3. Under resource-based theory (RBT), the value of the collaboration can be analyzed. Collaboration can be viewed as a joint attempt to leverage resource advantages. If each partner contributes its own unique and inimitable resources, the entire supply chain will profit and improve its competitive position – a win-win situation for all partners. In the given situation, the supplier has command of an innovative technology. The supplier hopes to tap a new business area, with the support of the manufacturer. If the manufacturer can contribute a resource that cannot be easily imitated by the supplier, collaboration makes sense. Such a resource might constitute the access to markets, knowledge of customer demands, distributions channels, or manufacturing know-how.
4. With agency theory, the given situation can be analyzed for potential agency problems, resulting in agency costs. The setting is characterized by an information asymmetry that can potentially be exploited by either party.
 - a) Hidden characteristics: since the manufacturer's management is new, they might be inexperienced and have little knowledge about the supplier's ability to contribute to the joint project.
 - b) Hidden action or hidden information: The manufacturer might be able to observe the actions of the supplier, but is incapable of understanding or evaluating them. This may lead to a situation of moral hazard: the supplier may hide certain features of their technology that would enable cost benefits for the manufacturer.
 - c) Hidden intention: Once the manufacturer (or supplier) has made significant investments in the new project, both parties can use the dependency of the other party to their own advantage.

Agency theory would suggest the following actions to avoid or mitigate such problems:

1. Screening: both parties should try to collect as much information as possible about the other party to reduce information asymmetry. E.g. references of other projects with other firms.
2. Self-selection: designing the contract of collaboration in a way that reveals potentially hidden characteristics.
3. Implementing outcome-based or behavior-based management mechanisms: A contract could define as precisely as possible the objectives to be achieved by each party and the contributions to be made by each party.

However, agency theory argues that no matter what agreement is made between the manufacturer and the supplier, there is always a residual loss, as information asymmetries and agency costs cannot be completely avoided.