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Case Studies: Analysing the Effects of Social Capital on Risks Taken by Suppliers in Outcome-Based Contracts

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This paper explores the effects of social capital (supplier-customer relationships) on risks taken in outcome-based contracts (OBC) by suppliers. In particular we explore risks of OBC, construction and development of social capital and effects of social capital on risks taken by suppliers. Semi-structured interviews were carried out in seven firms. Based on interviews, risks of OBC are identified and how structural, relational and cognitive social capital are constructed and developed is analysed. Social capital is identified to prevent and mitigate risks. This research can facilitate outcome-based contracts managers to think of risks of their contracts and the effects of customer-supplier relationships. In this way it contributes to firms' risk management and customer relationship management in providing services by OBC.

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Case Studies: Analysing the Effects of Social Capital on Risks Taken by Suppliers in Outcome-Based Contracts

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This paper explores the effects of social capital on risks taken in outcome-based contracts (OBC) by suppliers. In particular we explore risks of OBC, construction and development of social capital and effects of social capital on risks. Semi-structured interviews were carried out in seven firms. Based on interviews, risks of OBC are identified and how structural, relational and cognitive social capital are constructed and developed are analysed. Social capital is identified to prevent and mitigate risks. This paper aims to contribute to the research of risk management and customer relationship management in the field of servitization.

Introduction

Increasingly manufacturing firms are seeking competitive advantages by adding services to their offerings. This journey, sometimes called "servitization", is "the innovation of an organisation's capabilities and processes to better create mutual value through a shift from selling product to selling product-service-systems" (Neely, 2008). Along the journey, services move from base services to advanced services, and from supporting products to supporting customers (Baines and Lightfoot, 2013). The more advanced service contracts tend to be outcome based.

Outcome-based contracts (OBC), also referred to as performance-based contracts (PBC) or performance-based logistics (PBL), are contracts where "the firm is paid not according to its service activities such as material and repairs, but based on the outcome of such activities in continual use situations" (Ng et al., 2013). In OBC, suppliers are paid based on outcomes and carry the risk of undesirable outcomes. In this way, risks are transferred from customers to suppliers in an OBC (Hypko et al., 2010a).

Risks taken by suppliers are affected by their relationships with customers. The shift from transactional to relational based marketing (Neely, 2009) and relationships over extended life-cycles (Baines and Lightfoot, 2013) are considered as important features of servitization. A good relationship between the supplier and the customer, indicating a high level of mutual trust, reduces moral hazard and increases collaboration (Inkpen and Tsang, 2005), and the efficient interactions increase information transfer (Coleman, 1990). The reduced moral hazard, increased collaboration and increased information transfer can reduce risks of outcome-based contracts. In this paper, social capital is used to study the relationships between suppliers and customers. Although the effects of social capital on performance have been studied at different levels (Payne et al., 2011), there are few research studies that explore the effect of social capital on risks taken by suppliers, especially in the context of servitization and outcome-based contracts. To fill this research gap, this paper tries to answer the following questions:

1) What are risks of outcome-based contracts from the suppliers' perspective?
2) How can social capital be constructed and developed in outcome-based contracts?
3) What are the effects of social capital on risks of outcome-based contracts from the supplier's perspective?

Literature review

Outcome-based contracts

Though outcome-based contracts (OBC) are increasingly used in the provision of complex services, research on OBC is far from mature (Hypko et al., 2010b). Based on the existing definitions of outcome-based contracts in the literature, outcome-based contracts refer to contracts where customers pay for outcomes delivered by equipment (Ng and Yip, 2009), the accomplishment of performance goals (Hypko et al., 2010a) or outcomes of customer's value (Guajardo et al., 2012, Kleemann and Essig, 2013, Kim et al., 2007) instead of activities, tasks (Ng and Yip, 2009), behaviours (Hypko et al., 2010a), individual components of a solution (Kleemann and Essig, 2013), or a set of prescribed specifications (Bramwell, 2003).

Two criteria to define an outcome-based contract are first, the contract is relational instead of transactional, which means that the supplier is involved in the process of service consumption. Second, the supplier is paid based on outcomes or performance. In this paper, outcomes refer to either the outcomes of delivered total solutions (such as availability for asset management services) or the outcomes of customers' business achievement (such as the customers' financial performance for consulting services). The former is referred to as solution outcome-based contracts and the latter is referred to as customer outcome-based contracts.

Risks of outcome-based contracts

Risk is "an event with the ability to impact the mission, strategy, projects, routine operations, objectives, core processes, key dependencies and / or the delivery of stakeholder expectations" (Hopkin, 2012). Though discussions exist on whether positive uncertainty should be considered as risk, in this study, only negative effects of uncertainty are considered.

Risks discussed in the literature of OBC include the following aspects. 1) Suppliers' lack of capabilities to deliver services. Capabilities include knowledge capabilities, financial capabilities (Hypko et al., 2010a), cultural capabilities(Ng et al., 2009) and organizational capabilities (Raddats and Easingwood, 2010). 2) Information asymmetry (Hypko et al., 2010a). In OBC, suppliers rely more on information provided by customers, but customers can withhold important information (Homburg and Stebel, 2009, Hypko et al., 2010a). Besides, how services are implemented will not be specified in OBC, so customers cannot fully supervise suppliers' performance (Homburg and Stebel, 2009). 3) Ambiguity of contracts. In OBC, contracts are sometimes not as clearly indicated as in traditional contracts initially, and later negotiations are required (Homburg and Stebel, 2009). When the share of responsibility is not as clearly specified, both parties can find excuses to get rid of responsibilities (Ng et al., 2009). 4) High competition. By providing services with OBC, traditional manufacturing firms move away from competitive advantages (Raddats and Easingwood, 2010). 5) Opportunistic behaviours. Due to difficulties in observing each other's behaviours, both parties can work with low efforts, resulting in reduced quality and increased costs (Homburg and Stebel, 2009). 6) Interdependency. For long-term OBC, the long-term relationships between the supplier and the customer can lead to interdependence and high switching costs for both parties (Hypko et al., 2010a).

Existing literatures reveal that the research on risks of OBC is far from mature and structured. One purpose of the research is to analyse the risks of OBC in a more structured way.

Social Capital

In this research, "social capital refers to a firm's relationships with other companies that have important resources" (Ireland et al., 2002). Three dimensions of social capital are structural social capital, relational social capital and cognitive social capital (Nahapiet and Ghoshal, 1998, Tsai and Ghoshal, 1998, Uphoff and Wijayaratna, 2000, Bhandari and Yasunobu, 2009). According to Nahapiet and Ghoshal (Nahapiet and Ghoshal, 1998), structural social capital is "the overall pattern of connections between actors"; relational social capital is "the kind of personal relationships people have developed with each other through a history of interactions", while cognitive social capital refers to "resources providing shared representations, interpretations, and systems of meaning among parties".

Social capital can bring in four major benefits. 1) Better access to resources – social capital is considered by some researchers as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships"(Tsai and Ghoshal, 1998). 2) Better communication and information sharing (Putnam, 1995, Burt, 1997). First, social capital provides information channels through networks (Coleman, 1990), ensuring the efficiency of information sharing. Second, the increased trust makes actors feel comfortable to share core information (Kim et al., 2012). 3) Social capital facilitates cooperation. The increased trusts, shared goals, shared values and better interactions reduce moral hazard or opportunism. Actors in the network are willing to collaborate for better performance (Hayami, 2001, Inkpen and Tsang, 2005). 4) Social capital can lead to reduced transactional costs, which is partly due to better cooperation and better information sharing (Fukuyama, 1997, Nahapiet and Ghoshal, 1998).

Effects of social capital on risks in outcome-based contracts

Comparing risks of OBC and benefits of social capital, social capital is hypothesized to reduce risks of outcome-based contracts taken by the supplier. Better access to resources, better communication and information sharing, and better cooperation can increase knowledge sharing, which reduces the risk that suppliers lack the capability to deliver services. Better communication and information sharing and better cooperation can reduce conflicts due to ambiguous contracts. They can also decrease the risk of information asymmetry, and help suppliers to gain information advantages in a highly competitive environment.

Methodology

To explore the three sub questions, according to Yin (Yin, 2008), case studies are the proper research method for exploratory “what” and “how” questions. Interviews were carried out at service providers using OBC. In the interviews, interviewees were asked to introduce products and services their companies provided to customers and whether OBCs were used or what was the payment mechanism. Based on their description, combined with the definition of OBC given previously, four firms provide solution outcome-based contracts and three firms provide customer outcome-based contracts. We use the initials of firm names for confidential protection.

Table 1 Cases of the research

Solution OBC		Customer OBC	
Firm	Number of interviews	Firm	Number of interviews
Firm O	1	Firm F	1
Firm B	3	Firm I	2
Firm L	1	Firm P	4
Firm S	4		

All interviews were carried out as semi-structured interviews. The interviewees were asked questions regarding: 1) risks of OBC at both the negotiation stage and the implementation stage; 2) the construction and development of structural social capital, relational social capital and cognitive social capital; 3) effects of the three dimensions of social capital on risks of OBC from the suppliers’ perspective.

Analysis and discussions

Risk model of outcome-based contracts

The bow-tie model by Hopkin (Hopkin, 2012) is the basis of analysis for risks of outcome-based contracts. However, based on our case studies, we modify the bow-tie model (Figure 1). Here a latent risk is “risk that has the potential to happen”, and a realised risk is “risk that has already happened”. One or more risk factors can contribute to a latent risk. A risk factor refers to “an adverse condition existing within the firm or outside the firm that contributes to the happening of risk”. When a trigger comes, the latent risk can become a realised risk. When a risk is realised, it leads to one or more consequences. A consequence is “an event that happens as a result of the happening of risk”, such as penalty or renegotiation of contracts. The impacts of these consequences can come from three aspects, which are financial impact, strategic impact and operational impact (Casualty Actuarial Society Enterprise Risk Management Committee, 2003). An amplifier is “a condition that enlarges the impact of a consequence”, and a common amplifier in OBC is the pre-investment that a supplier needs to make, which can enlarge the financial impact of risks.

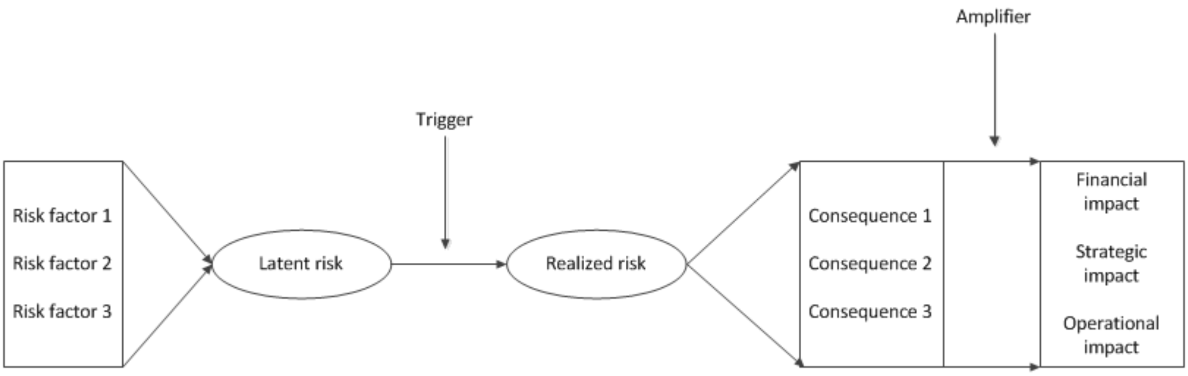

Figure 1. The risk model of outcome-based contracts

Here is an example of the application of the risk model (Figure 2). Firm I provides customer outcome-based contracts, achieving specific financial matrix for the customer based on the technology that will be used. One interviewee said "these risks typically range from the ability of the service to be delivered successfully over a long period of time from a service provider's perspective…", so one latent risk is "failure to deliver the required service" and one factor that leads to the latent risk is "supplier's lack of capability to deliver service". The interviewee also said "when we sign the contract, we make certain assumptions on the expected growth in the market, changes in demographics and also the way technology will evolve going forward… if there is an unexpected event or unexpected situation where either the outcomes are lagging the assumptions or there are changing market dynamics, then there might be more attention paid to those specific metrics…so the differences (between OBCs and traditional contracts) are primarily due to the length of a contract…". So another risk factor is the long term nature of OBC. And the trigger for the latent risk to become a realised risk is "environment change". When this latent risk becomes a realised risk, two consequences can happen. The firm needs to "come up an action plan that can be put into place to help these clients" and "the lagging performance could adversely impact the relationship".

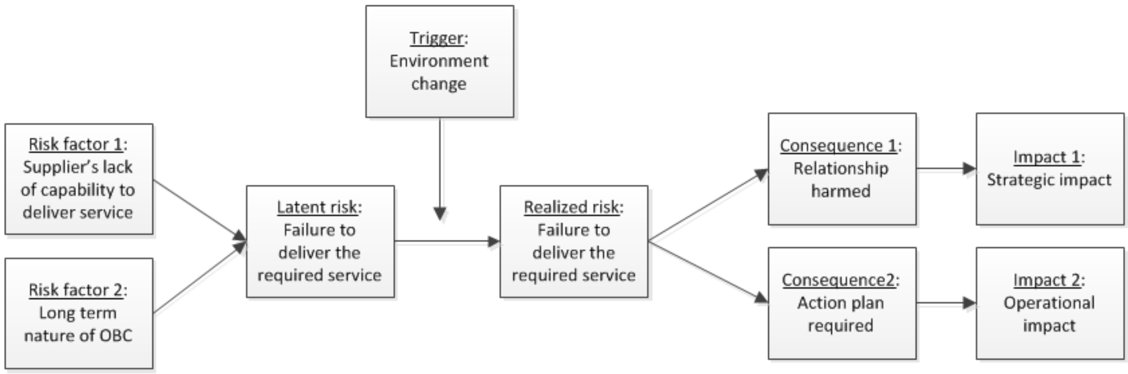

Figure 2 Risk analysis example using the risk model

Transcribed interview texts were analysed and coded in NVivo 9. Based on the above definitions of risk factors and latent risks, risk factors and latent risks mentioned by interviewees were identified and created as nodes in NVivo. Sentences and paragraphs mentioning any of these risk factors or latent risks were coded into the related nodes. The same process was also carried out for the analysis of social capital.

Key elements to construct and develop three dimensions of social capital were created as nodes and related texts were coded.

Based on the analysis, 28 risk factors were identified (Table 2). Regarding the sources of risk factors, these risk factors come from aspects of contract, environment, customers, suppliers or differences between supplier and customer.

Table 2. Risk factors of outcome-based contracts based on interviews

Aspects		Risk factors
Contract		High complexity of the contract
		High value of the contract
		Long term contracts
		Delay in value delivery due to the outcome nature
Environment		High competition in the industry
		Change in the ecosystem environment
		Lack of control over other ecosystem members
Customer		Complex working process of the customer
		Demanding customer demands
		Diversified customer demands
		Dynamic customer demands
		Customer's lack of capability to consume services
Supplier	Capability	Supplier's lack of capability to deliver service
		Supplier's lack of capability/mechanism to establish OBC
	Internal communication	Inconsistency between negotiation and implementation team
		Inconsistency between the hierarchical levels
		Lack of sales incentives for OBC
	External communication	Lack of understanding over customers
		Lack of understanding over external environment
		Lack of identification by customers and the society
		Lack of efficient communication structure between supplier and customer for OBC
	Business model	At the early stage of business model innovation
		Traditional business model is used
Differences between supplier and customer		Mismatching between goals of the supplier and the customer
		Different perceptions / understandings of KPIs
		Different visions between supplier and customers
		Different corporate culture between supplier and customer
		Power imbalance

20 latent risks were identified (Table 3). These latent risks are about several aspects such as negotiation power, negotiation procedures, contract decisions, implementation risks due to the supplier, the customer, the environment or the requirements of OBC.

Table 3. Latent risk of outcome-based contracts based on interviews

Aspects	Risk events
Negotiation power	Supplier gives up more during negotiation
	Supplier loses initiatives during negotiation and follows the customer
Negotiation procedures	Slowness / complexity / costliness in negotiation
	Failure in getting the contract
Contract decisions	Wrong choice of customers
	Unsuitable / immeasurable KPIs
	Over promise
	Supplier signs the contract without fully understanding the consequences
Implementation risk due to the supplier	Failure in delivering required services
	Inefficient implementation of contracts
	Diversified local delivery level
Implementation risk due to the customer	Unexpected changes in customer's organization
	Unpredicted customer demands
	Services are not consumed in the expected way
Implementation risk due to the environment	Contracts no longer fit the environment
	Failure of other ecosystem members
	Conflicts between the supplier and other ecosystem members
Implementation risk due to the requirements of OBC	Upfront investment
	Development of customized contracts / solutions
	Development of new capabilities

Construction and development of social capital

Interviewees were also asked questions regarding the construction and development of the three dimensions of social capital. It is found that five perspectives are important for the construction and development of structural social capital, which are 1) how to reach customers; 2) whom to reach / interact with; 3) how to interact with customers; 4) what to interact with customers and 5) internal integration. According to Inkpen and Tsang(Inkpen and Tsang, 2005), trust and friendship are important perspectives for relational social capital while shared corporate culture, shared goals and shared visions between the supplier and the customer are important perspectives for cognitive social capital. Table 4 lists key elements to build social capital based on the analysis described in the previous section.

Table 4. Construction and development of social capital

Key elements to build structural social capital	
How to reach customers	Sales teams (bottom up) / Senior managers (top down) / Pre-existing relationships / Snowball effects
Whom to reach/interact with	Different levels of interactions / Different functions of interactions / Risk contact points / Joint teams
How to interact	Regular communications / Formal governance structures over the interaction / Service points are set near the customer / Regular tracking & reporting
What to interact	The choice between fully open or limited open to customers
Internal integration	Vertical integration of different hierarchical levels
	Longitudinal integration of negotiation and implementation

	Horizontal integration of different sectors and functions
Key elements to build relational social capital	
Trust and friendship	Reputation / Brand
	Pre-existing relationships
	Successful previous cases
	Good performances
	Build both firm level and personal level trust
Key elements to build cognitive social capital	
Shared visions	Select customers with same visions
Shared goals	OBC leads to increased aligned goals
Shared corporate culture	Adjust to different corporate culture of customers
	Export corporate culture to customers
	Localization

Another issue in the construction and development of social capital is the inter-relationship between the three dimensions of social capital. Existing research has shown that the three dimensions of social capital are not independent with each other (Li et al., 2013, Carey et al., 2011), which was further verified in the interviews. Interviews show that each dimension of social capital can facilitate the formation of the other two dimensions.

Effects of social capital on risks of outcome-based contracts from suppliers' perspective

It is found that social capital can prevent the happening of risk and mitigate the impact of risk when risk happens. Based on interviews, there are four points where social capital can make an influence (Figure 3). Social capital can modify the conditions of risk factors and prevent the formation of latent risk (SC risk prevention point 1), and can also prevent the realization of latent risks after a trigger appears (SC risk prevention point 2). When a latent risk becomes a realized risk, the risk management moves from a proactive way to a reactive way. Social capital can make an effect before any consequences take place (SC risk mitigation point 1), but can also reduce the impacts of certain consequences (SC risk mitigation point 2).

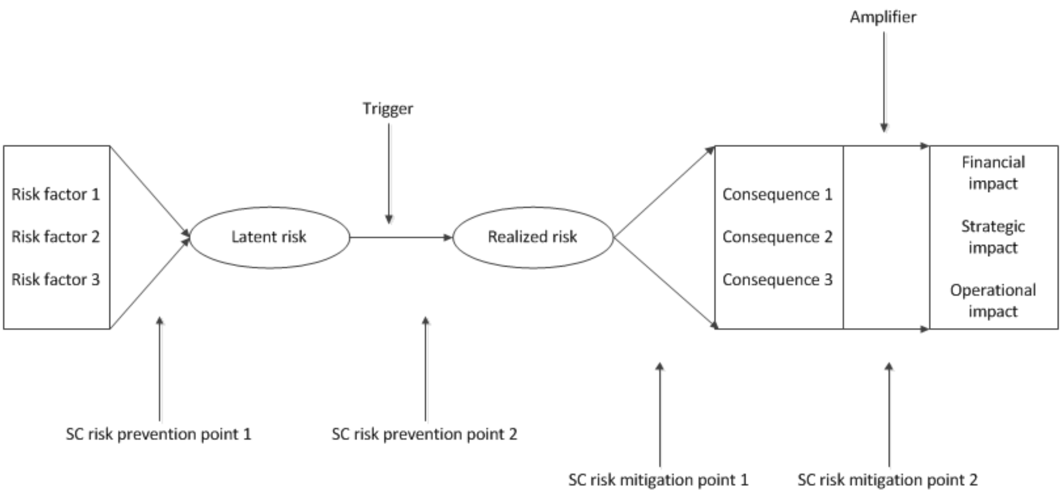

Figure 3 Effects of social capital (SC) on risks of outcome-based contracts

Still take Firm I for example, from the interviewee of Firm I who mentioned the risk "failure to deliver the required service", the following effects of social capital are identified, together with the enablers (Table 5).

Table 5 Example of effects of social capital on risks of OBC

Social capital	Working point	Quote	Enabler
Relational social capital	Prevention point 1	"So typically the trust doesn't prove because as you know the outcome based contracts do require a very significant understanding of the clients' financial and business, internal data and matrix. So there has to be a level of trust of implicitly as part of these outcome based contracts".	Mutual understanding
Structural social capital	Prevention point 2	"The idea is to reduce the risk for any changes in external factors that may diversely impact the outcome based contracts. So the way we go about doing it would be to increase the interactions, get a better handle on what new capabilities need to be deployed to mitigate the risk".	Information sharing
Structural social capital	Mitigation point 1	"Increase the interactions…and also then come up an action plan that can be put into place to help these clients and the service factor get back on clients with the outcome that were promised".	Information sharing
Relational social capital	Mitigation point 1	"So if there's mutual understanding and trust between the service provider and the client, then if there are some situations which a crisis occurs, then the trust and friendship gives enough time for the two parties to resolve any differences and take collective actions".	Flexibility
Cognitive social capital	Mitigation point 1	"The shared goals and win-win scenarios, the two parties can work together to mitigate the risks that might be in an outcome based contract".	Collaboration
Relational social capital	Mitigation point 2	"If the trust is not there, then even a smaller issue with the lagging performance could adversely impact the relationship".	Flexibility

Conclusions

This paper focuses on the effects of social capital on risks of OBC. Interviews were carried out in seven firms. A risk model of OBC is proposed and 28 risk factors and 20 latent risks are identified from interviews. The ways to construct and develop the three dimensions of social capital – structural social capital, relational social capital and cognitive social capital are derived from interviews. Regarding effects of social capital on risks of outcome-based contracts, it is found that social capital can work at four points of the risk model to prevent and mitigate risks.

This research contributes to literature in the following ways. First, risks of OBC are analysed in a structured way for the first time. The proposed risk model can be used not only for the analysis of risks of OBC, but also for general risk management. Previous literature identified six major risks of OBC from the supplier's perspective, while we extend them to 28 risk factors and 20 latent risks, coming from different aspects and covering both the negotiation and the implementation stages of an OBC. This list, though still needs to be supplemented in the future research, gives an overview of risks of providing services by OBC from the supplier's perspective. Second, the study on effects of social capital on risks links the research on risk management and social capital together, which is a research gap in the servitization research. It will also contribute to industry. This research can stimulate outcome-based contracts managers to think of risks of their contracts and the effects of customer-supplier relationships.

For future research, more interviews will be carried out and cross case comparison between solution OBC and customer OBC will be presented, aiming to fill the research gap in the field of servitization.

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