Appendix 2 to
"Effects and influencing factors of PBC: A network-analysis"

IPSERA 2024 submission

Abstract

For procuring companies, incentives are essential for contract-based supplier management. One way to apply contract incentives is through Performance-based contracts (PBC). To successfully design and implement a PBC, procuring companies need to understand the cause-effect relationships of PBC constructs. This requires the identification of effects which result from PBC antecedents and success factors, especially financial and non-financial incentives, on suppliers' behaviour and PBC effectiveness. Therefore, this article aims to uncover the effect relationships by applying a network-analysis. The network-analysis is based on a systematic literature review and focuses on both, quantitative studies, as it is intended to study already researched effect relationships, and on qualitative studies to derive propositions. The review includes 77 contributions on PBC. Altogether, this work explicates antecedents, success factors, incentive types, and their effects on PBC effectiveness. The network analytical method visualises the effect relationships. Furthermore, the network-analysis distinguishes core constructs of PBC and how they interrelate, providing insights for procuring companies on contract design and implementation for supplier management.

Keywords: Performance-based Contracting, Literature review, Network-analysis, Effects

Submission category: Competitive paper

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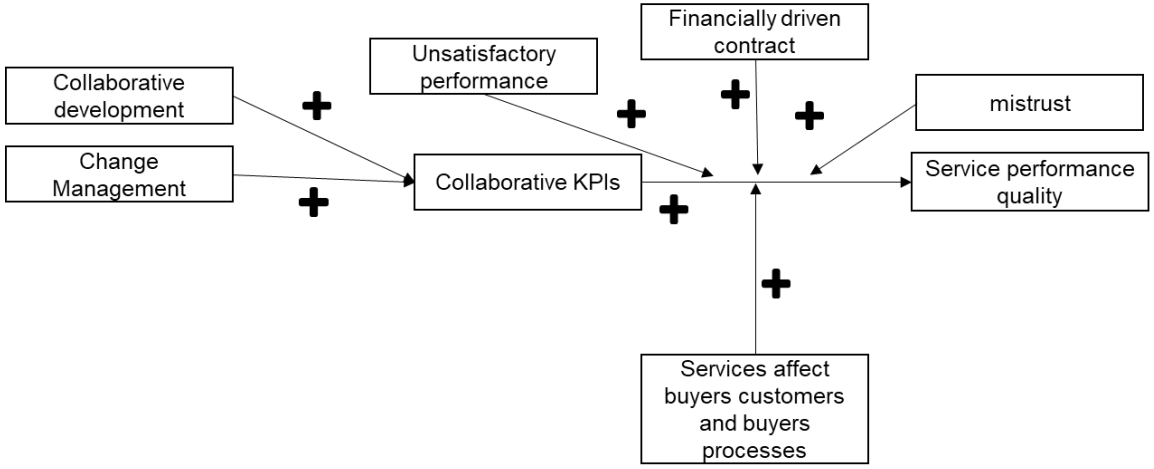
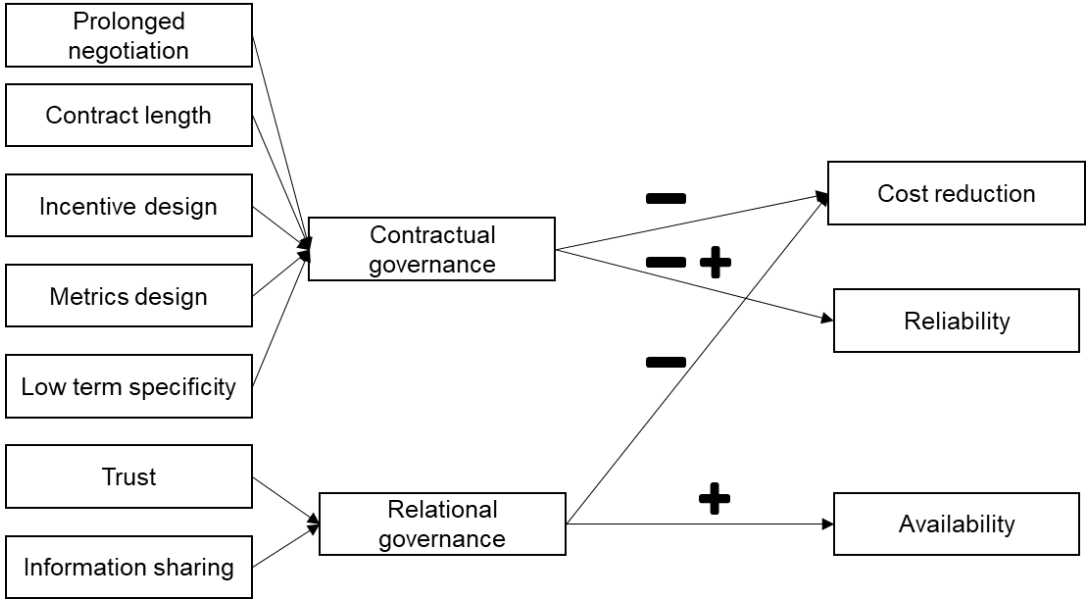
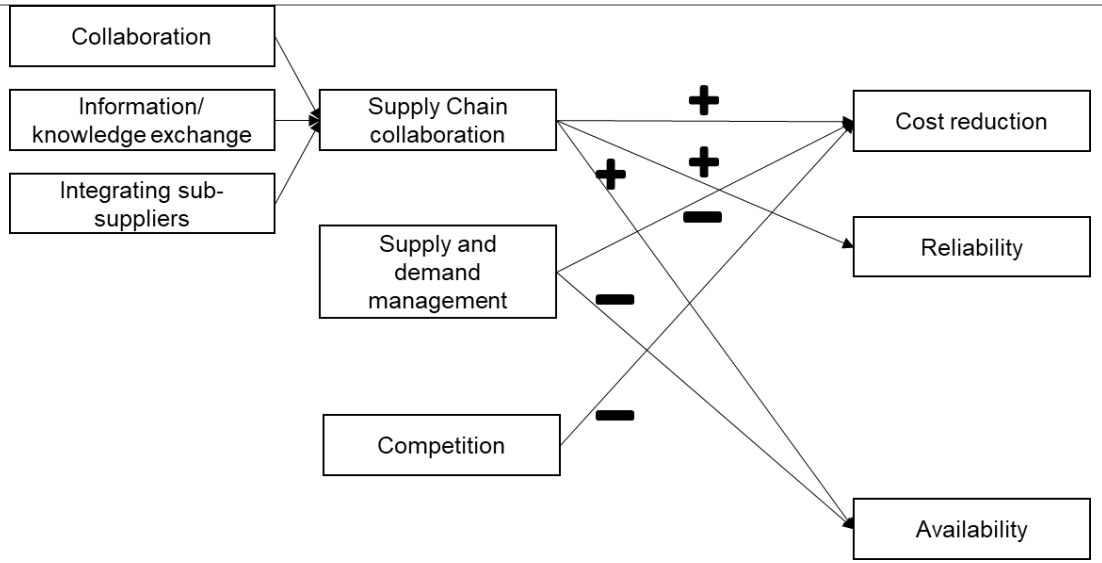
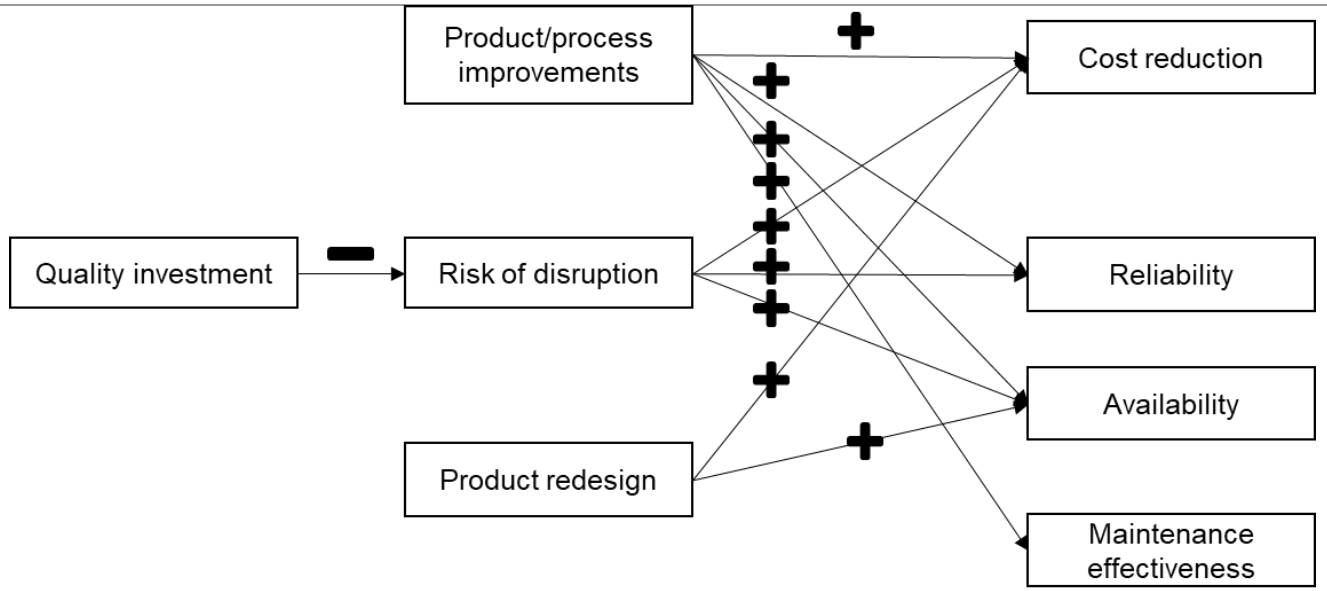
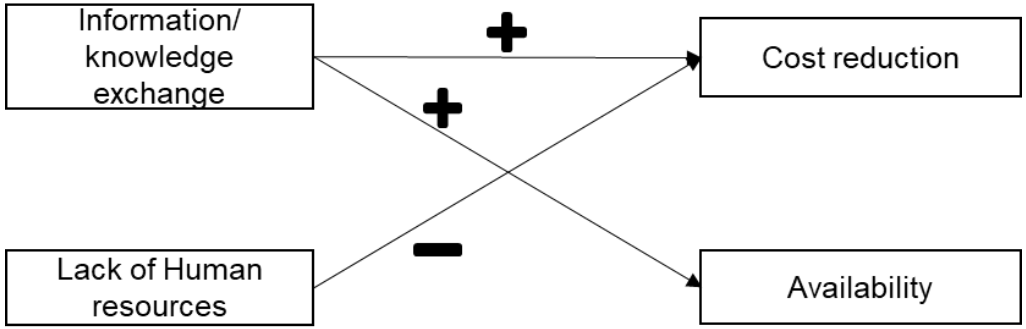
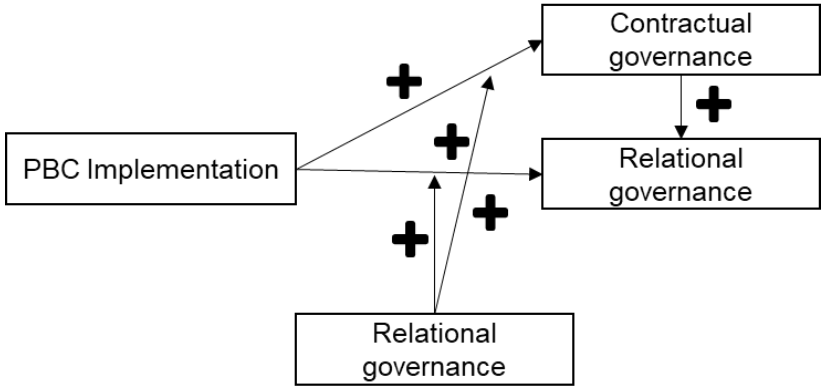
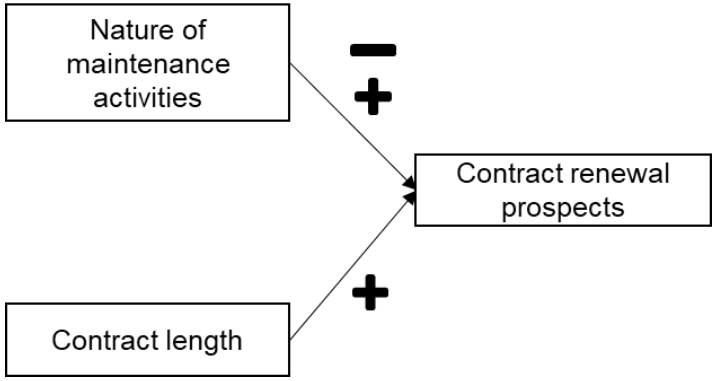
Table 4 – Findings on additional quantitative and qualitative effects of PBC

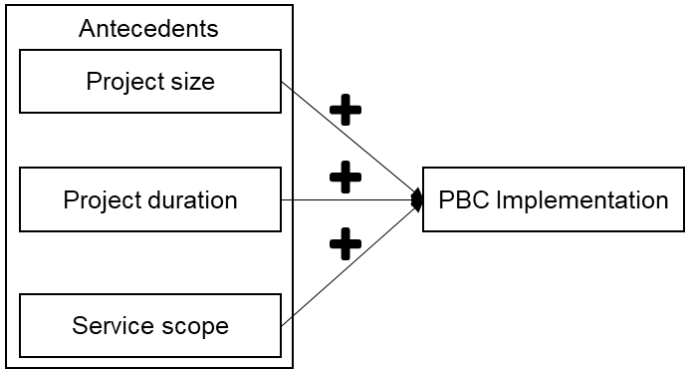
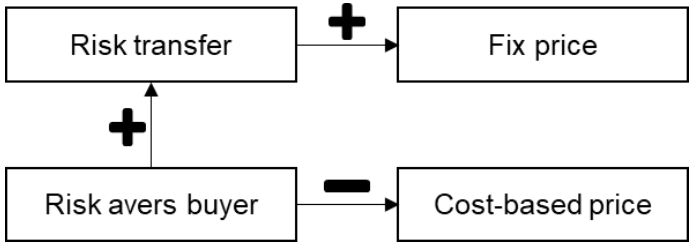
No	Reference	Propositions and graphical representations
1.	Akkermans et al. (2019)	P1: Performance of an outsourced, co-produced service will be enhanced by the use of KPIs that measure and reward both supplier and customer (buying firm) performance. P2: The development of a collaborative KPI contracting approach, and thereby the performance of an outsourced, co-produced service, will be enhanced by the use of collaborative development and change management processes, involving representatives deeply familiar with the actual service operations and the interdependencies between the service processes at the supplier and the buyer. P3: The collaborative KPI contracting approach will have a positive effect on the performance of an outsourced, co-produced service, both when these services directly affect external customers of the buyer and when these services directly affect the primary processes of the buyer. P4: The collaborative KPI contracting approach will have a positive effect on the performance of an outsourced, co-produced, and complex service, both in the case of services with continuous delivery and in the case of discontinuous delivery. P5: The collaborative KPI contracting approach will have the biggest impact on performance when there is a financially driven contract, very low operational performance, and extensive mistrust on both sides. 
2.	Alqahtani et al. (2023)	Prolonged negotiation, poor incentives and KPIs, and freedom in the SOW can affect cost. Long contracts can help suppliers improve their products. Poor KPIs and incentives can affect suppliers' willingness to improve reliability. A lack of trust can lead to a reluctance to collaborate, which can in turn increase the cost.

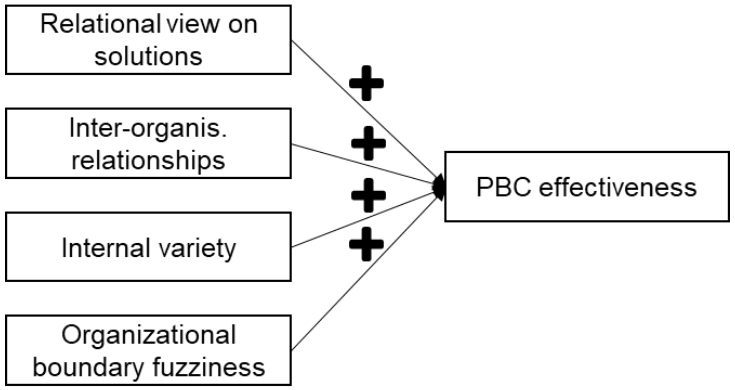
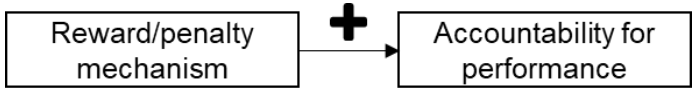
		Failures to exchange information can consequently lead to hidden costs. Sharing information can help to achieve availability targets. 
3.	Alqahtani et al. (2023)	Suppliers' involvement through collaboration and knowledge sharing is key to reducing cost. Failing to accurately forecast demand for spare parts can increase budget losses (i.e. cost). A limited number of available suppliers can lead to cost increases. Integrating sub-suppliers will affect availability since they have the ability to increase spare parts quality. Failure to accurately forecast demand for spare parts can negatively impact a weapon system's readiness, i.e. availability. Integrating sub-suppliers will affect reliability since they have the ability to increase spare parts quality.

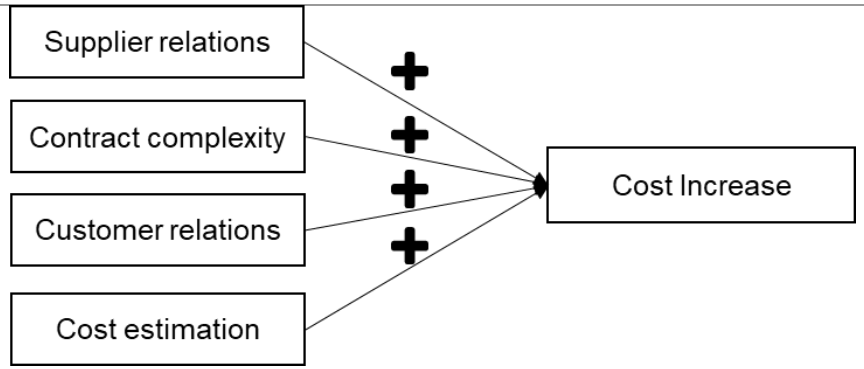
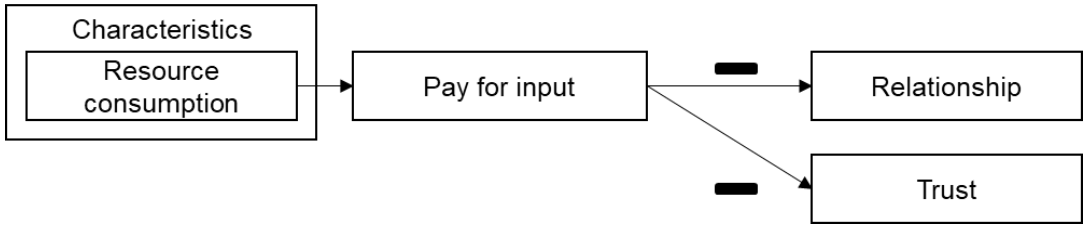
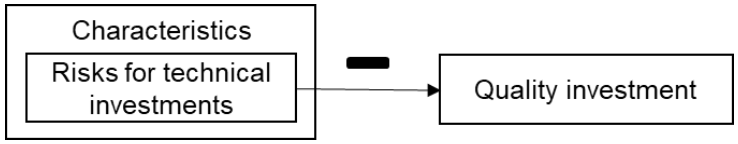
		
4.	Alqahtani et al. (2023)	Through the use of best commercial maintenance practices, PBL is likely to improve the service and at a lower cost. Investing in technology reduces the risk of disruption, which results in better cost efficiency. Redesigning high-failure components can reduce the cost of spare parts. Improving the maintenance turnaround time will improve the availability of the weapon system. Investing in technology reduces the risk of disruption, which leads to a higher availability rate. Redesigning high-failure components can improve the readiness of a weapon system, i.e. availability. Increased repair capacity can lead to improved reliability. Investing in technology reduces the risk of disruption, which leads to a lower failure rate, i.e. better reliability. Improving the maintenance process can improve maintenance effectiveness.

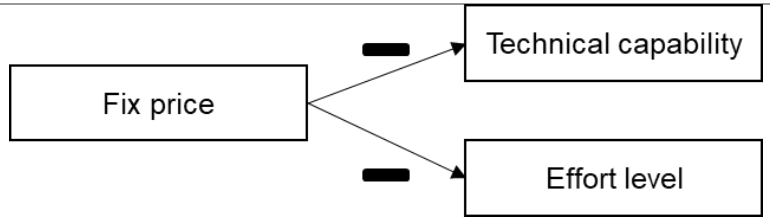
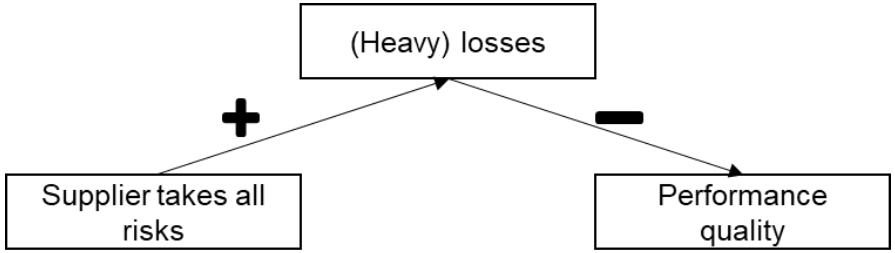
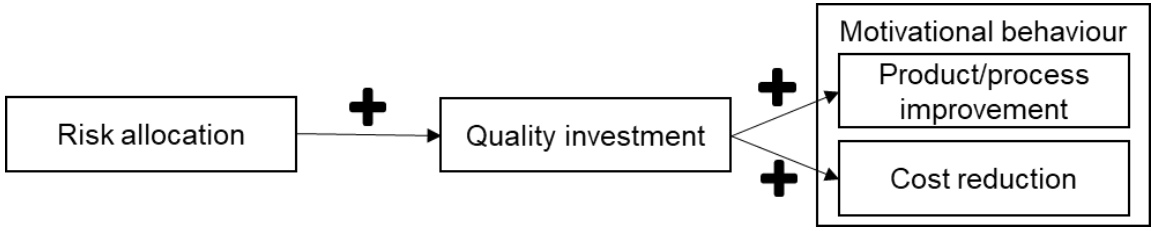
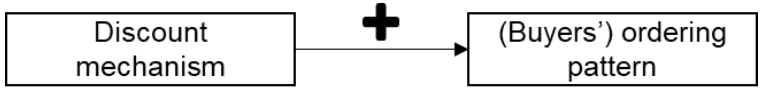
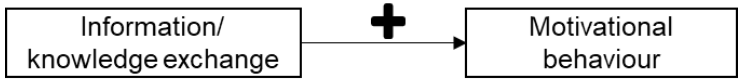
		
5.	Alqahtani et al. (2023)	Sudden changes in the defence environment affect the cost of operations negatively. Uncertainties as a result of war affect availability negatively Different mindsets between a buyer and supplier can result in difficulties in transitioning to PBL and incur hidden costs. Culture clashes can hinder teamworking, which will affect reliability improvements. The defence procurement structure (having operational and commercial customers) can increase the time needed to draft a contract, which can in turn accumulate additional costs and affect a supplier's profit. 

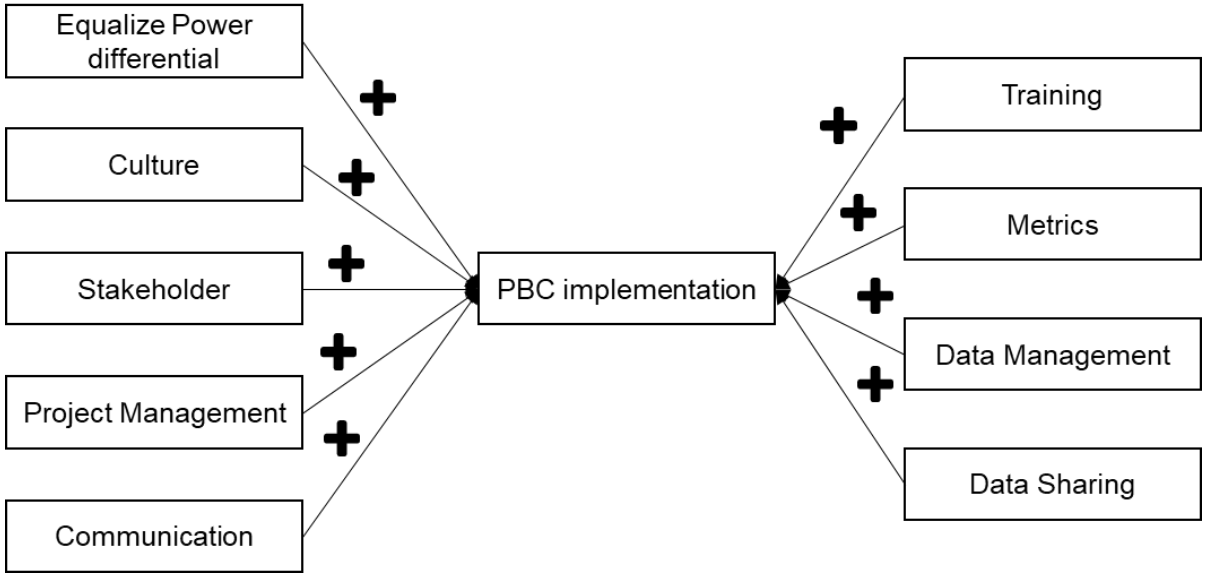
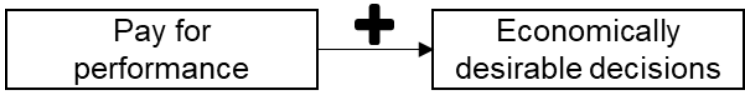
6.	Ates et al. (2023)	PBC implementation leads to outcome control on CG, which translates into RG effects through the implementation of PBC control and the potential of advanced digital technologies to improve the effectiveness of both governance mechanisms. 
7.	Anastasopoulos et al. (2009)	The model results show that PBC prolongation is positively related to the original contract period and to the presence of certain maintenance activities - illumination repair and maintenance, shoulder repair and maintenance, mowing, and traffic signs and signals - in the work scope. The contract period, bridge-tunnel or rest area maintenance activities, and the number of activities incorporated in the PBC were found to decrease the probability that the PBC would not be prolonged. 

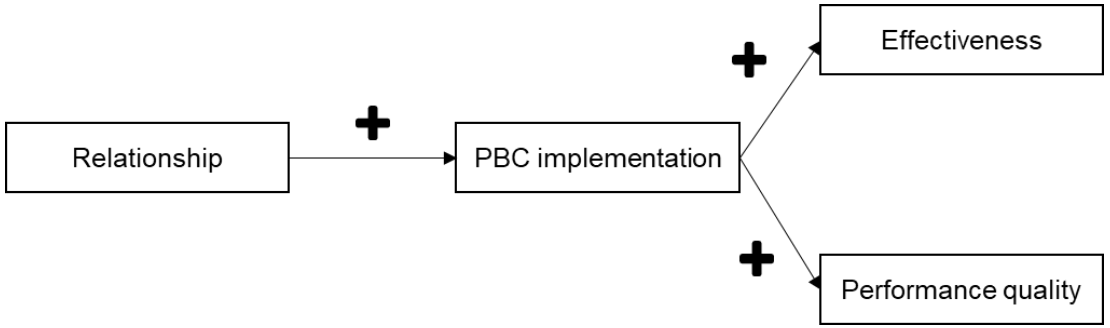
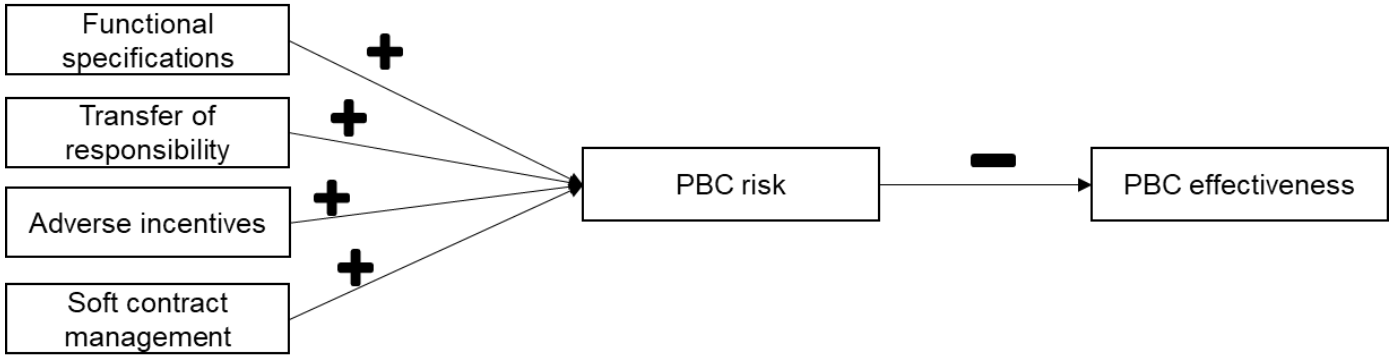
8.	Anastasopoulos et al. (2009)	We find that large projects with strong competition, long duration and extension periods, long outsourced road sections that incorporate crack sealing, pothole repair, illumination repair/maintenance, and mowing activities, favour outsourcing under PBC. 
9.	Bajari and Tadelis (2001)	If the buyer is risk averse, then a compensation structure based on cost reimbursement should be avoided (fixed price is the greatest possible risk transfer). 
10.	Batista et al. (2017)	Proposition 1. Servitization through OBC requires a shift from a product-centric view of solutions to a relational-process view of solutions. Proposition 2. In servitization initiatives through OBC systems, variety arising from the customer organization is mainly an issue of internal variety, rather than variety originated from the external environment. Proposition 3. The development of purposeful relationships between the firm and the customer are critical to guarantee the viability of servitization initiatives through OBC. Proposition 4. Organizational boundary fuzziness is an inherent feature of OBC service systems, in which the operational, managerial and governance functions should be primarily determined by the systems' purpose and not limited by organizational boundaries.

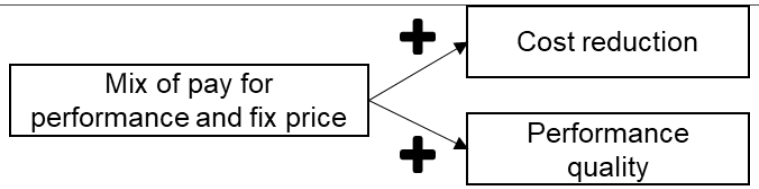
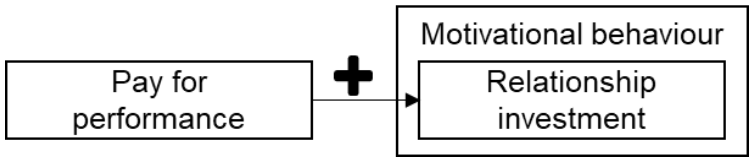
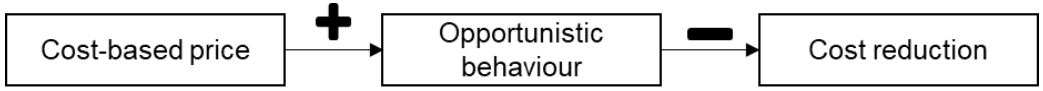
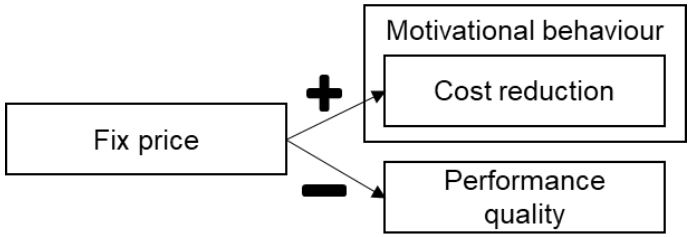
		
11.	Chansa et al. (2020)	Suppliers can be held accountable for their performance, if a reward/penalty mechanism is defined, which is linked to the (non)performance. 
12.	Datta (2020)	The major hidden cost drivers at different PBC stages are identified and their impacts on different service network partners are shown in Table 4. The performance loss resulting from the Prime's inability to align the wider supply base impacted the Prime and the suppliers more than the customer. Contract complexity and customer relationship management had severe impacts on the customer. Wrong estimates due to cost estimation problems impacted the suppliers severely. The supply base and Near Primes were largely unaffected by the Prime's customer relationship management abilities. These findings help to refine the framework developed in Section 2 of the paper based on agency theory (AT) and S-D logic.

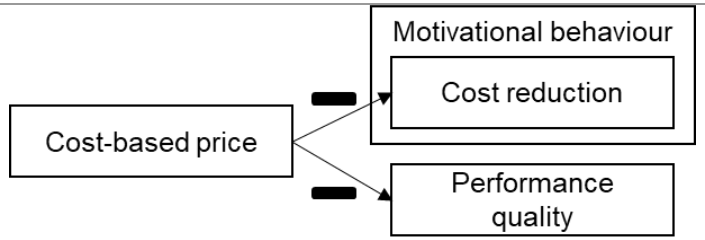
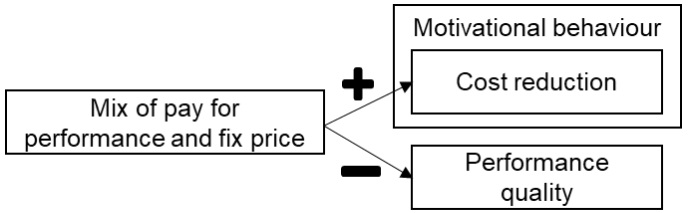
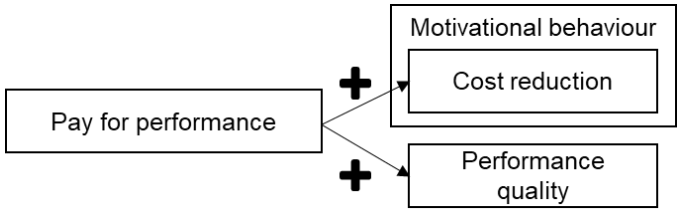
		
13.	Datta and Roy (2013)	Since the suppliers are paid per unit basis for each extra unit of spare or manpower, the relationship or trust does not exist. 
14.	Datta and Roy (2013)	When the supplier takes all risks for making technical investments but since he has to bear the costs themselves, he will not invest in permanent facility just in short-term facility depending on the needed spare volume. 
15.	Datta and Roy (2013)	When the supplier is paid only for a fixed price amount he will reduce the technical capability and efforts to the minimum.

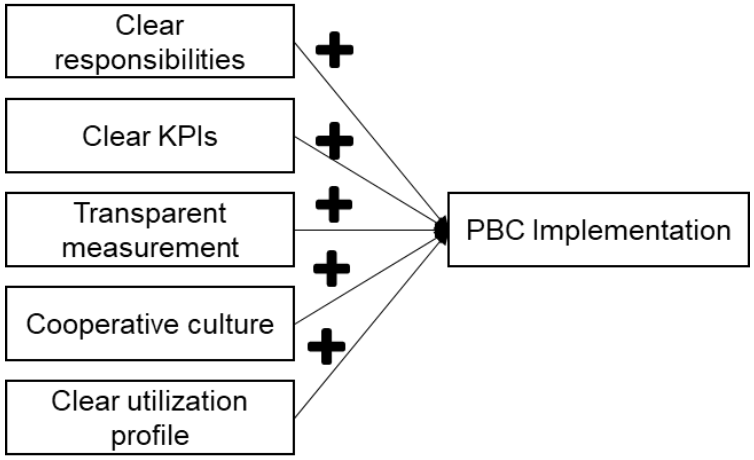
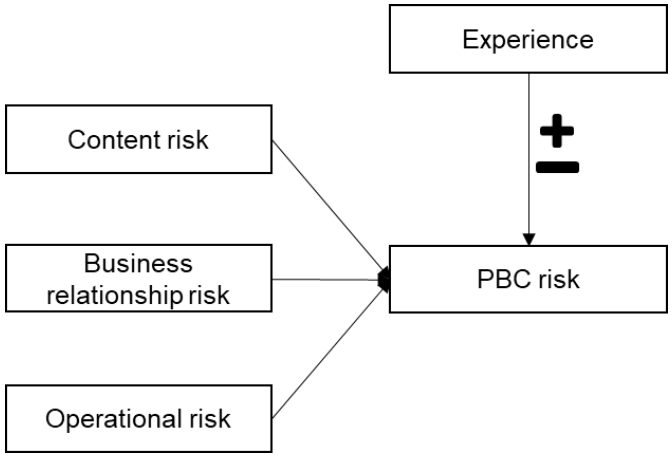
		
16.	Datta and Roy (2013)	If a supplier is incurring heavy losses by taking all the risks, it will be very difficult to motivate them to deliver the quality of service specified by the buyer. 
17.	Datta and Roy (2013)	Under a 50:50 risk sharing mechanism, the supplier feels empowered and makes the best possible investments in technology and manpower to reduce costs for both parties (including transaction costs). 
18.	Dolan (1987)	Transaction based incentive mechanisms like quantity discounts influence the buyers ordering pattern. 
19.	Dyer (1996)	Relational incentive mechanisms like information and knowledge exchange between buyer and supplier can be motivative. 

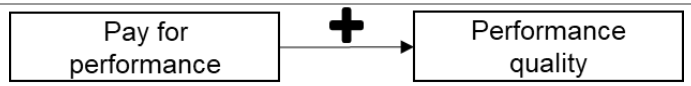
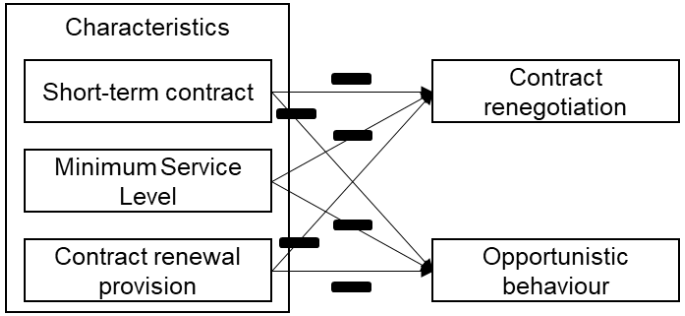
20.	Elder et al. (2012)	Recommendation 1: Establish a Culture of Collaboration, Trust, and Cooperation. Recommendation 2: Get the Right Parties to the Table. Recommendation 3: Change the Culture of Contracting/ Equalize the Power Differential. Recommendation 4: Engage in Active Project Management. Recommendation 5: Clearly Define Performance Measures/Assessment/Incentives Emphasizing Practices That Staff Directly Control. Recommendation 6: Develop and Implement a Coherent Communication Strategy. Recommendation 7: Provide Training and Technical Assistance. Recommendation 8: Engage in CMA-Driven Project Management. Recommendation 9: Consider Data Management Issues. Recommendation 10: Use Data to Strengthen a Quality Improvement Model. Recommendation 11: Integrate Data Sharing Into Project Management and Communication Strategies. 
21.	Farrell et al. (2014)	When managers' emotional responses have the potential to lead to decisions that are not in their firms' best economic interests, utilizing performance-based incentive contracts raises the probability that they will instead opt for choices that are more financially beneficial. 

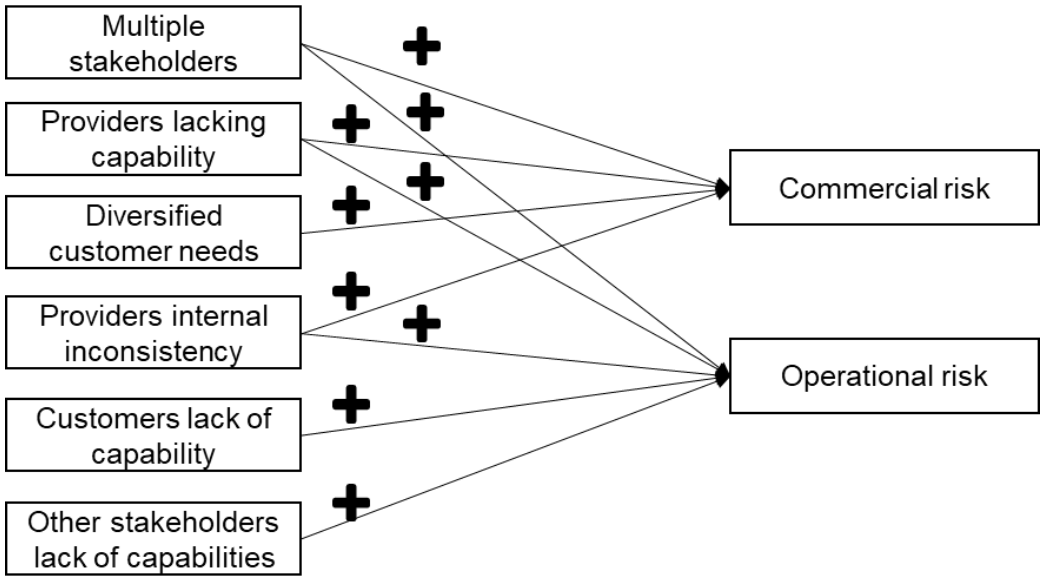
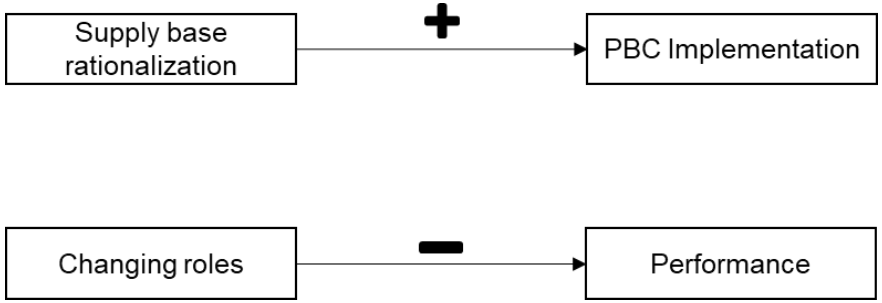
22.	Fuller et al. (2018)	The contractors appeared to feel that Florida's AMC program resulted in higher-quality, more effective work than more traditional contracts. Partnering was highlighted as a specific, critical aspect of the Florida AMC program. 
23.	Ganesan (1994)	Relational incentive mechanisms like a good reputation can be motivative. 
24.	Gelderman et al. (2019)	The PBC-induced risks for clients relate to the problematic translation and measurement of specifications, the avoidance of contractors taking full responsibility, incentives encouraging undesirable behavior and Soft contract management reducing PBC effectiveness. 
25.	Glas et al. (2013)	A financial incentive with a combination of fixed and performance-based compensation a supplier is able to become more profitable by reducing costs as long as the specified performance is provided.

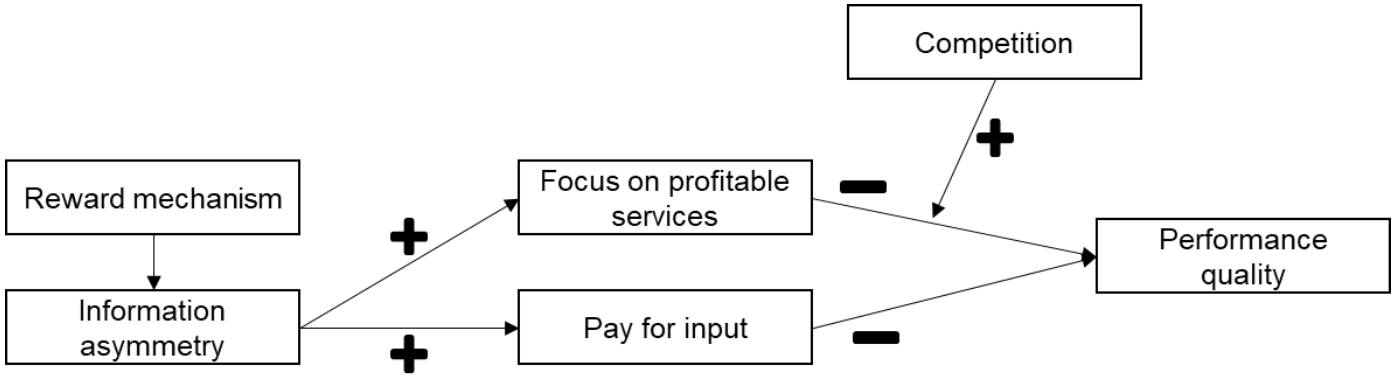
		
26.	Glas et al. (2013)	Outcome based contracts have the potential to stimulate desired behaviours' due to incentives. This, in turn, can encourage providers to invest in the relationship. 
27.	Glas and Essig (2010)	In a cost-plus financial incentive suppliers try to inflate costs to increase their profit margins. 
28.	Glas and Essig (2010)	A fixed price incentive strongly motivates a supplier to reduce costs, but presents a risk of moral hazard as there is no compensation for outcome improvements. Consequently, the supplier may only guarantee a relatively low level of outcomes to prevent contract penalties. 
29.	Glas and Essig (2010)	A cost-plus incentive does not motivate a supplier to reduce costs because this would decrease his profit margin. As there is no reward for achieving higher levels of performance, the supplier has no inherent interest in the quality of the output.

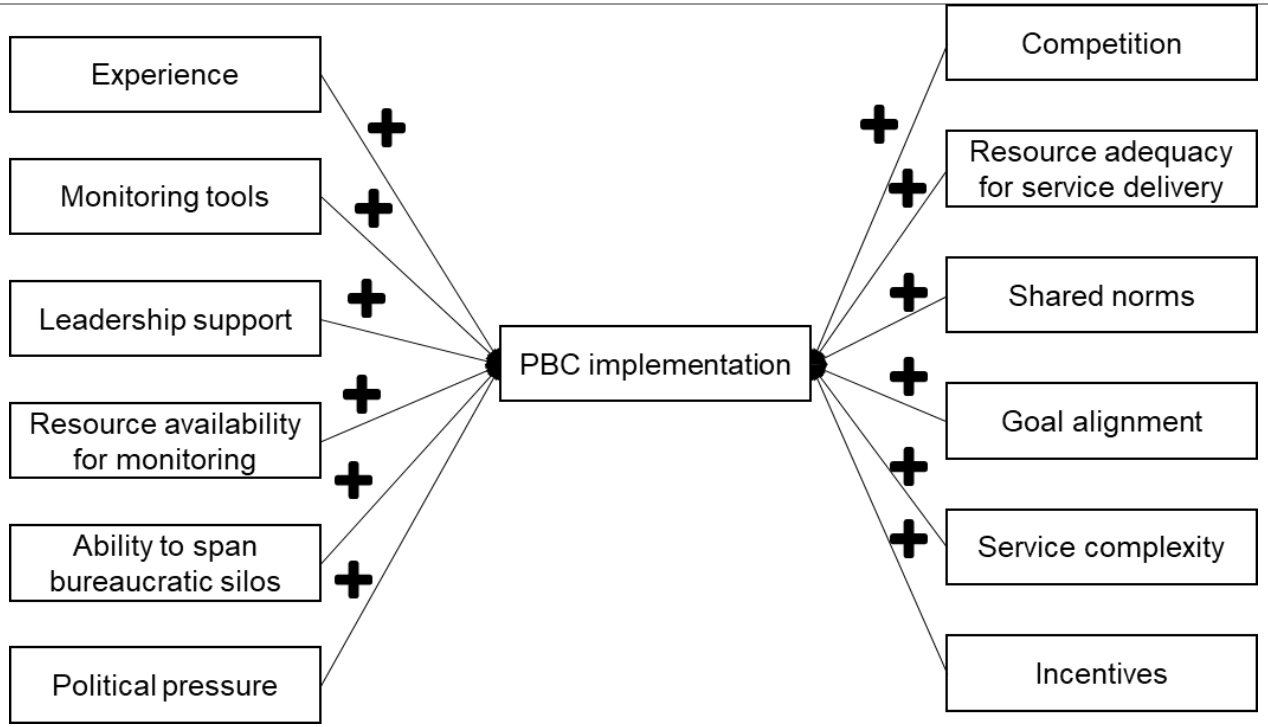
		
30.	Glas and Essig (2010)	A combination of fixed and performance parts motivates a supplier strongly for cost reduction but not for higher outcome level. 
31.	Glas and Essig (2010)	A full performance based financial incentive generates strong motivation for cost reduction and for outcome improvements. 
32.	Glas and Kleemann (2017)	Identification of contextual factors which have an impact on how PBC offers are implemented in practice. The results show that the most important factors of PBC are clear responsibilities, clear performance indicators, transparent measurement, cooperative culture and a precise utilization profile of core assets.

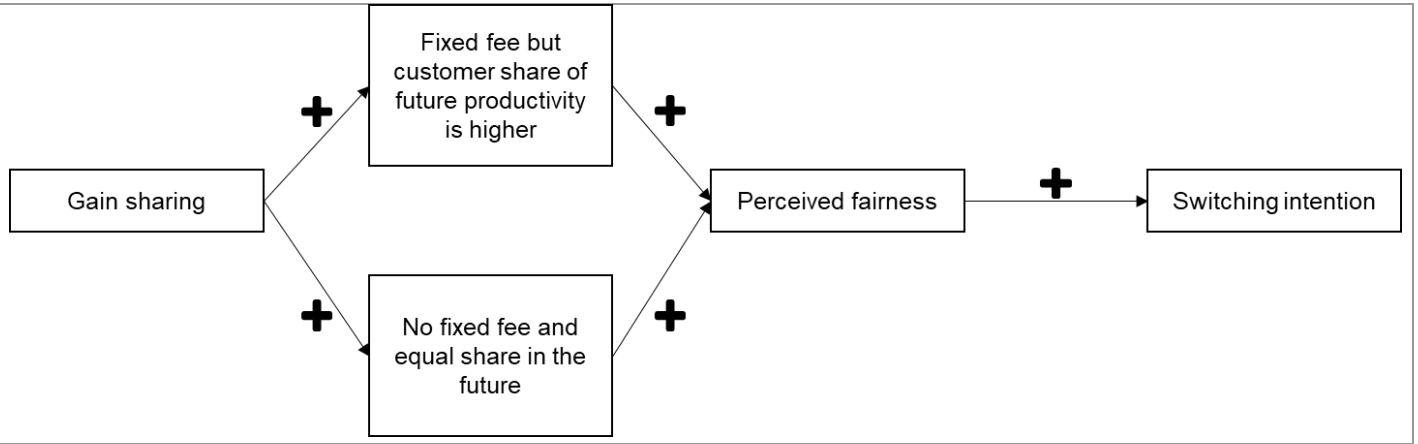
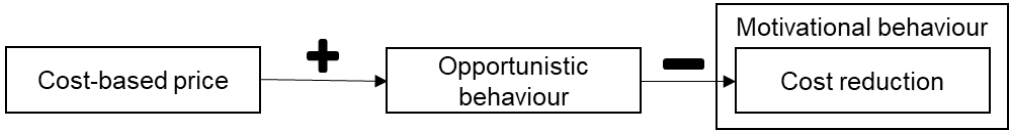
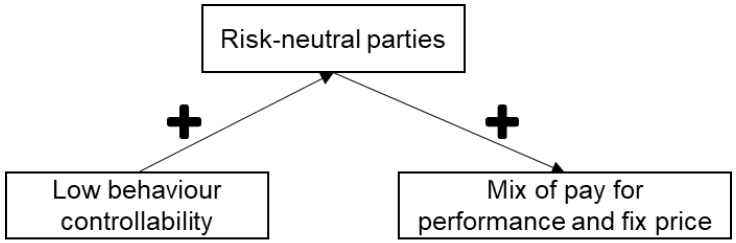
		
33.	Glas et al. (2019)	It was shown that experience is of statistical relevance for risk perception. Risk perception in PBC is not static but develops when PBC buyers gain experience with the PBC business model. The findings of the factor analysis show that there are three major factors of PBC risks: content risks, business relationship risks and operational risks. 
34.	Guajardo et al. (2012)	PBC has a positive and significant effect on product reliability; the product reliability under PBC is 25-40% higher than under a time and material contract.

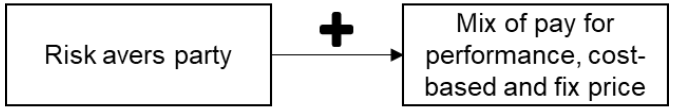
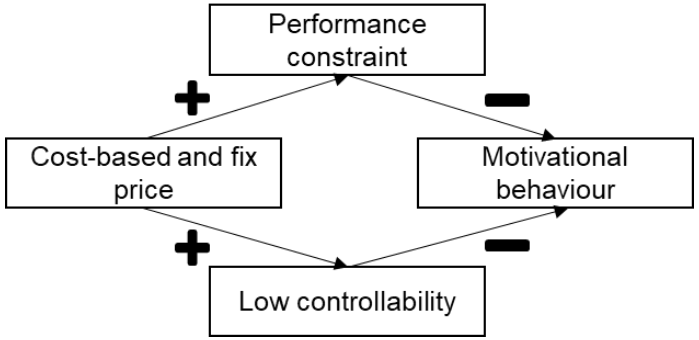
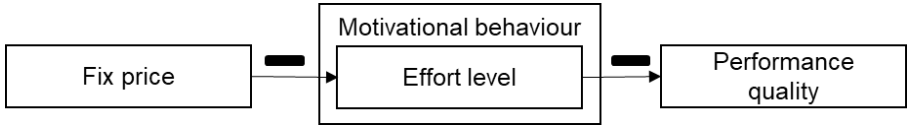
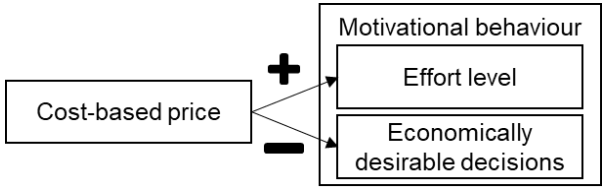
		
35.	Hooper (2008)	The payment model is important if suppliers effort can not be perfectly observed. 
36.	Hooper (2008)	To manage information asymmetry PBC can be an optimal solution. 
37.	Hooper (2008)	Minimum Service Levels, contract renewal provisions and a shorter contract term limit ex post contract renegotiation and protect a purchaser from opportunistic behaviour. 
38.	Hou and Neely (2018)	For commercial risk, the most discussed risk factors are involvement of multiple stakeholders, providers' lack of capabilities to contract OBC, diversified customer demands, providers' internal inconsistency and long-term contracts. For operational risk, the most discussed risk factors are providers' lack of capabilities to deliver OBC, customers' lack of capabilities to consume the delivery and to play their roles, involvement of multiple stakeholders, providers' internal inconsistency and other stakeholders' lack of capabilities to perform.

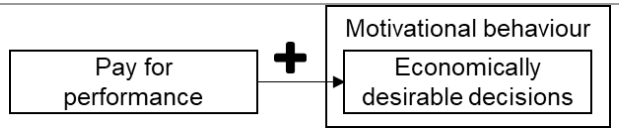
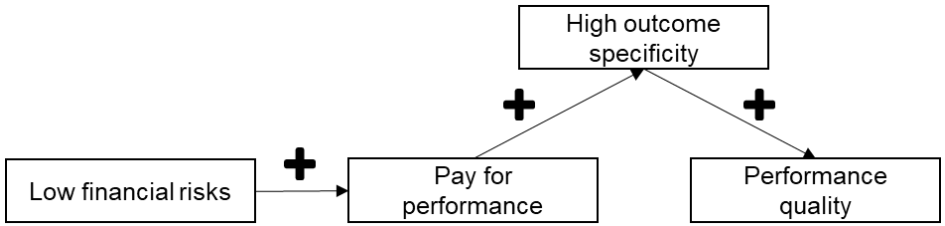
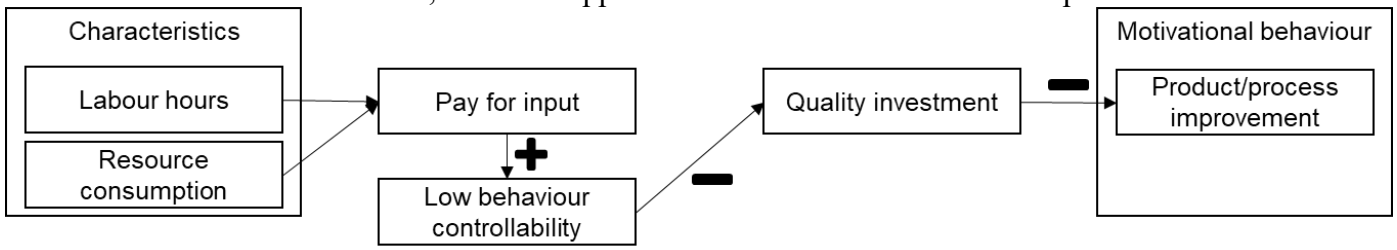
		
39.	Howard et al. (2016)	We find from our study that PBC requires a clear delineation of roles, and will underperform or fail when roles keep changing. Our study suggests that supply base rationalization is a necessary precursor to make PBC and the participative relationships it demands operate effectively. 
40.	Jiang et al. (2020)	If social services suffer from PBC compensations (focus on core service), then increased competition can lead to an improvement in performance. In the presence of information asymmetry between the payer and the hospitals regarding hospitals' operating costs, the social welfare loss generated by the fee-for-service

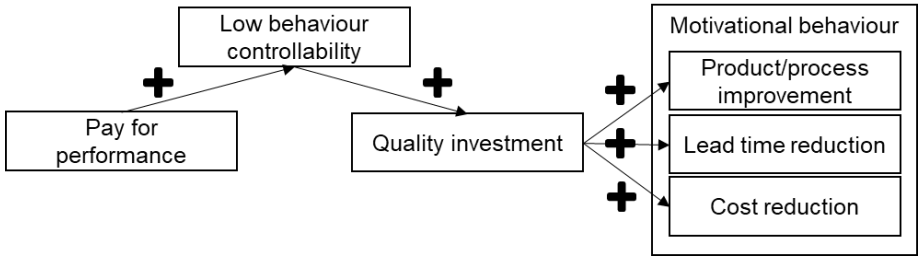
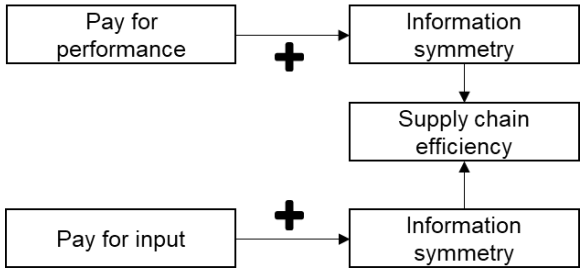
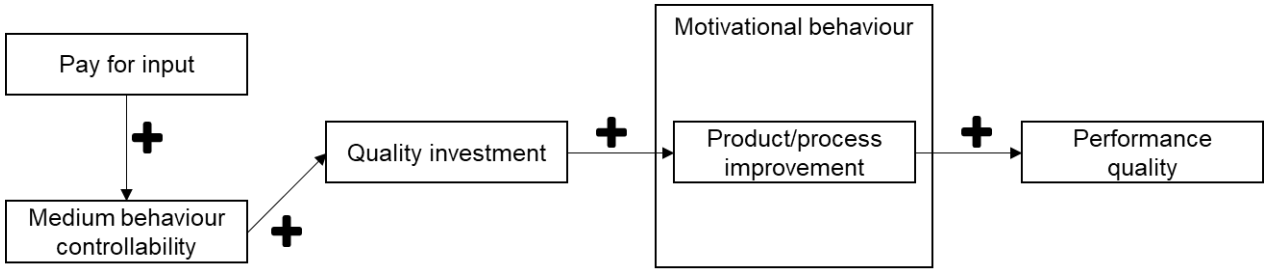
		compensation as well as by the optimal bonus contract can be partially mitigated by increasing the degree of competition for patients. 
41.	Kearney et al. (2012)	Recommendation 1: Establish a Culture of Collaboration, Trust, and Cooperation. Recommendation 2: Get the Right Parties to the Table. Recommendation 3: Change the Culture of Contracting/ Equalize the Power Differential. Recommendation 4: Engage in Active Project Management. Recommendation 5: Clearly Define Performance Measures/Assessment/Incentives Emphasizing Practices That Staff Directly Control. Recommendation 6: Develop and Implement a Coherent Communication Strategy. Recommendation 7: Provide Training and Technical Assistance. Recommendation 8: Engage in CMA-Driven Project Management. Recommendation 9: Consider Data Management Issues. Recommendation 10: Use Data to Strengthen a Quality Improvement Model. Recommendation 11: Integrate Data Sharing Into Project Management and Communication Strategies.

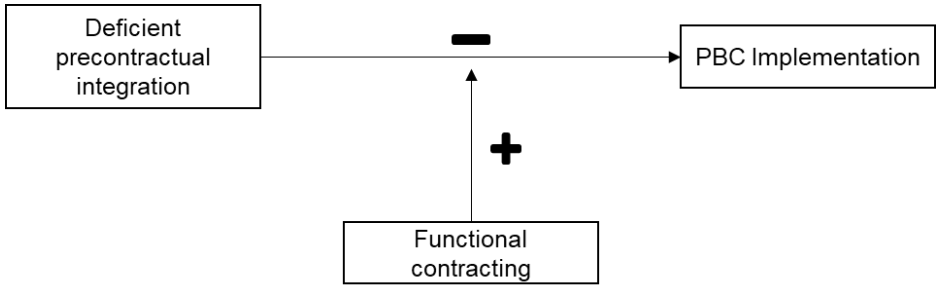
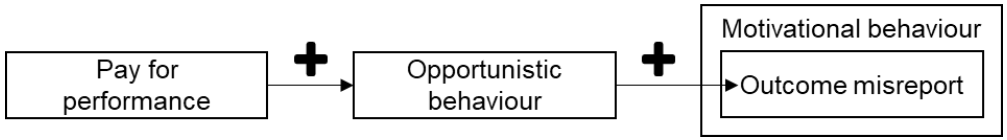
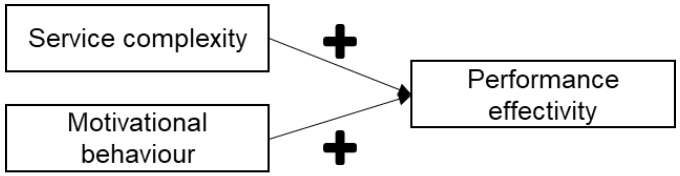
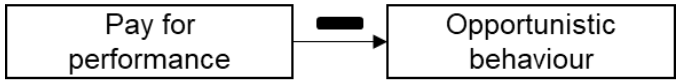
		
42.	Keränen et al. (2023)	The results from this study show that individuals who make buying decisions respond differently to economically equivalent gain-sharing contracts with different pricing schemes (see Table 7). A gain-sharing split that compensates suppliers with a fixed up-front fee but entitles customers to a higher share of future productivity improvements increases their acceptance of gain-sharing arrangements in the context of PBCs. The equity theory driven mediator of perceived fairness, rather than the agency theory driven mediator of perceived risk, explains the customer's switching intentions.

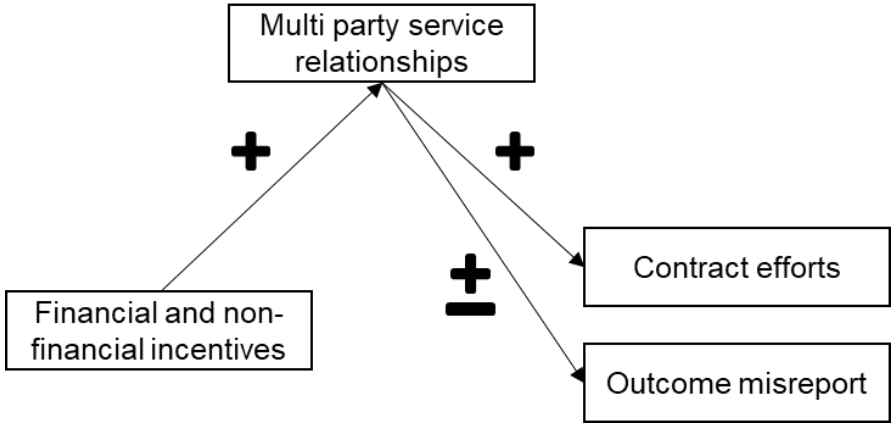
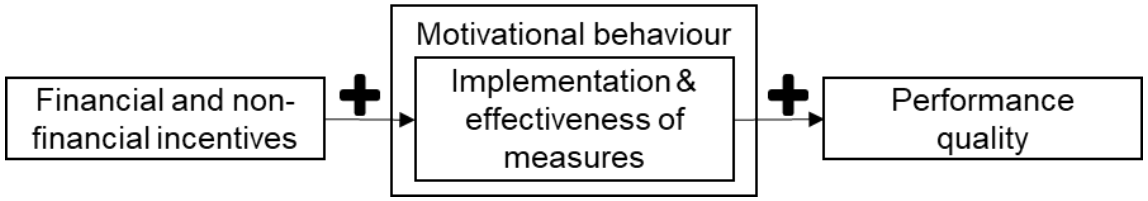
		
43.	Kim et al. (2007)	If a purchaser wants to minimize costs, remuneration structures based on cost reimbursement should be avoided (supplier tries to generate high costs). 
44.	Kim et al. (2007)	If supplier behaviour can be controlled (suppliers' decisions are observable and contractable), then a compensation structure comprising of cost reimbursement elements mixed with fixed components should be applied. 
45.	Kim et al. (2007)	If supplier behaviour cannot be controlled and the parties are risk-neutral, then a performance-based compensation structure with fixed components should be designed. 

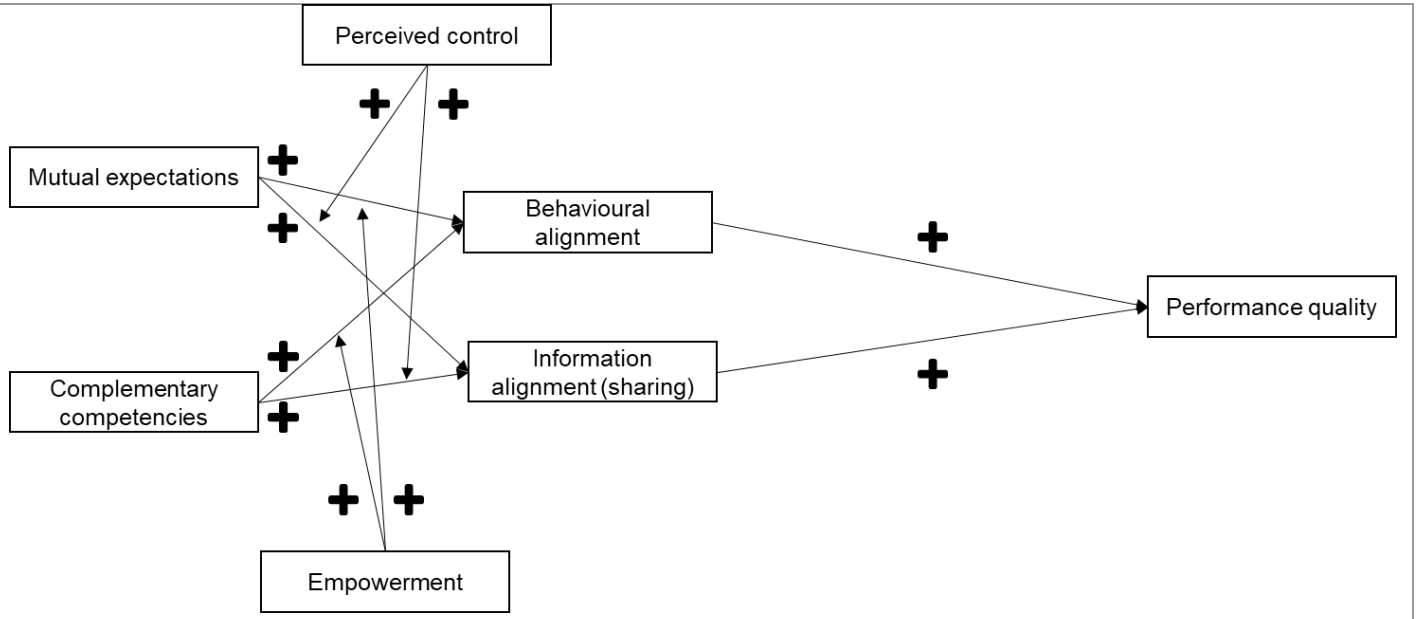
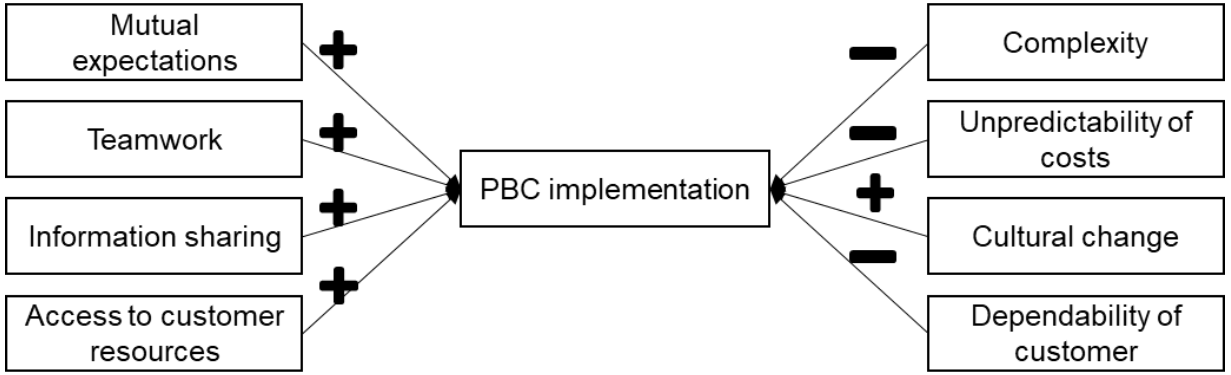
46.	Kim et al. (2007)	If one of the parties' is risk averse, it is advisable to develop a combination of fixed payment, cost-sharing payment, and a performance payment. 
47.	Kim et al. (2007)	Cost plus and fixed-price incentives do not elicit the desired supplier behaviour when there is a performance constraint and the customer cannot observe supplier actions. 
48.	Kim et al. (2007)	Due to the fixed price financial incentive, the supplier is motivated to minimize both effort and spare parts inventory, thereby compromising the customer's desired minimum availability (low level of inventory). 
49.	Kim et al. (2007)	Cost-plus financial incentives result in a supplier's ambivalence towards the selection of spare part inventory, leading to high levels of inventory. 
50.	Kim et al. (2007)	A pure performance based financial incentive can motivate the supplier to choose the optimal inventory level.

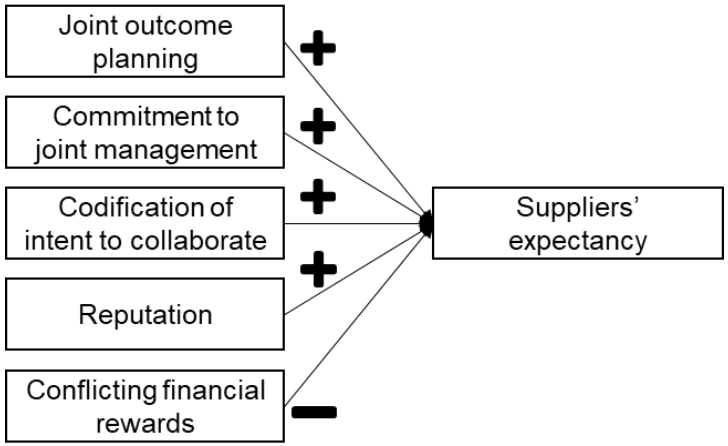
		
51.	Koning and Heinrich (2013)	Moving to a 100 % performance-based payment increases the quantity of performance but not the quality (performance result duration), if the expected output is not fully specified. Incentives are most likely to work when the financial risks of performance-based payments for suppliers are not too large. 
52.	Koning and Heinrich (2013)	If risks arise in the context of PBC service delivery that could jeopardise contract fulfillment, unintentional supplier's behaviour may arise, such as selections in the scope of services (skipping subtasks or priorization of tasks with a lower risk). Opportunistic behaviour and bad performance results in dissatisfied customers, this can damage the reputation and future contracting prospects of suppliers. 
53.	Li et al. (2023)	If the supplier's revenue depends on labour hours and resource consumption and his behavior is unobservable and/or unverifiable, then the supplier is not motivated to to invest in performance. 

54.	Li et al. (2023)	If suppliers' revenue depends on product availability, the supplier will be motivated to work faster, to improve product reliability and reduce (maintenance) costs. When the supplier's effort is unverifiable, the PBC always motivates the supplier to invest in capacity and improve product uptime. 
55.	Li et al. (2023)	When all information and actions are observable and verifiable, the two contracts (Transaction based Contract and Performance based Contract) are on an even footing in that they can both achieve supply chain efficiency. 
56.	Li et al. (2023)	When supplier's capacity is verifiable but information of product failure rate is asymmetric, the Transaction based Contract can motivate the supplier to set up a higher capacity and realize a higher system uptime than PBC. 

57.	Liinamaa et al. (2016)	We identify functional contracting as a solution for value-based sellers to overcome the barriers arising from deficient precontractual integration. 
58.	Lu and Ma (2006)	The implementation of PBC results in a financial incentive for suppliers to misreport information about outcome to external evaluation systems. 
59.	Lu et al. (2003)	Performance effectivity is affected by the match between service complexity and the performance behaviour intensity of the supplier. 
60.	Lu et al. (2003)	PBC has a positive effect on the reduction of opportunistic behaviour (dumping of patients). 
61.	Lu (1999)	Incentives in PBC can improve effort induced by the contract or change the suppliers reporting practice in three party service relationships (supplier, regulator and customer).

		
62.	Mechanic (2002)	Incentives have profound influence on the implementation and effectiveness of internal measures intended to promote high quality of performance. 
63.	Mirzahosseinian et al. (2016)	The numerical example shows that the change in the operating fleet size significantly influences the supplier's profit margin and his decision on reliability, spares stock, and service capacity. 
64.	Ng et al. (2013)	Our study shows that behavioral and information alignments are important to achieve outcomes. However, material and equipment alignment (i.e., joint supply chain) does not have a significant effect on contract performance. In addition, perceived control and empowerment mediated the relationship between partnership inputs and value-driven alignments.

		
65.	Ng and Nudurupati (2010)	This study identified the challenges and risks of implementing OBCs, which include complexity and unpredictability of costs, dependability on customer in delivering the service and cultural change from traditional setting. Although the survey results revealed 11 factors that could mitigate these challenges and risks, the most important factors are mutual expectations, teamwork, shared information and materials as well as the firm's access to customer resources. 

66.	Nikulina and Wynstra (2022)	The codification of intentions to collaborate in the process of outcome creation is positively related to suppliers' instrumentality. The reward sharing ratio proportional to the value of the individual contribution is positively associated with suppliers' instrumentality.
67.	Nikulina and Wynstra (2022)	Joint collaborative involvement in planning the outcome creation process is positively related to suppliers' expectancy. Commitment to joint collaborative management and control of outcome creation is positively related to suppliers' expectancy. Codification in contracts of the intention to collaborate in the process of outcome creation is positively related to suppliers' expectancy. The technical and managerial reputation of the PBC parties and the buyer positively affects suppliers' expectancy. Conflicting financial reward schemes between individual input-based rewards of PBC parties in case of hybrid PBC are negatively related to suppliers' expectancy. 
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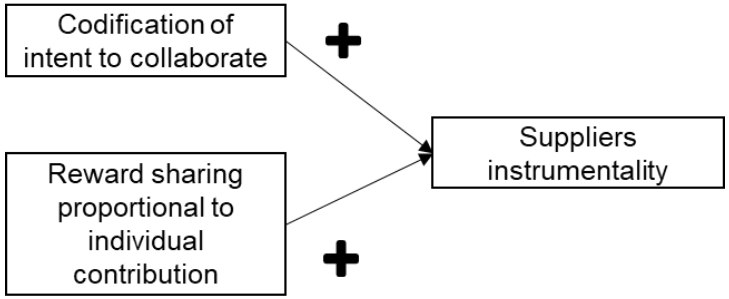
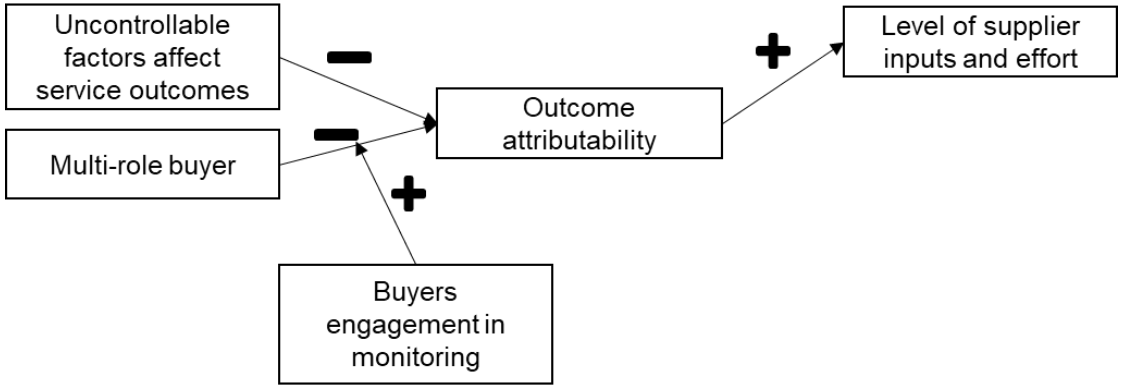
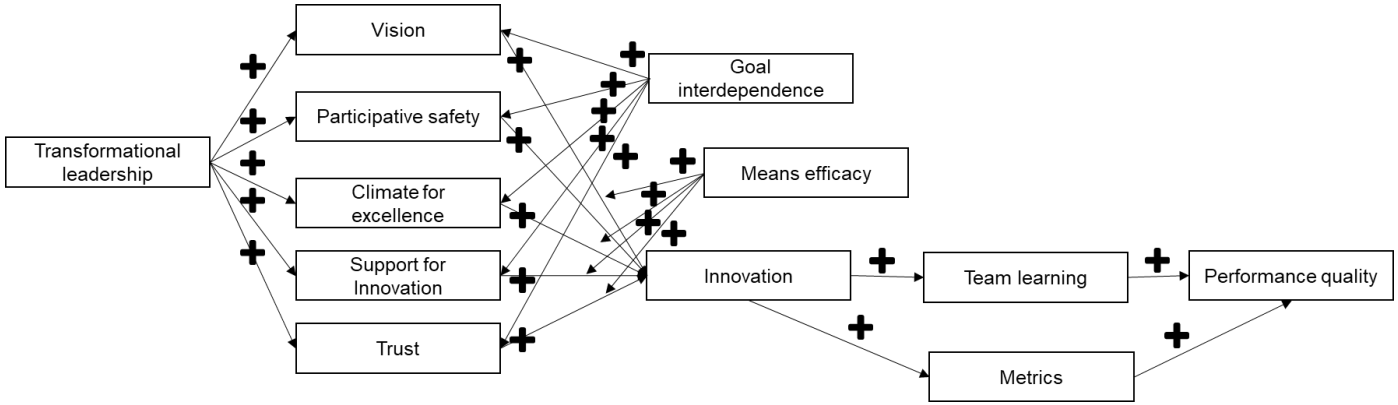
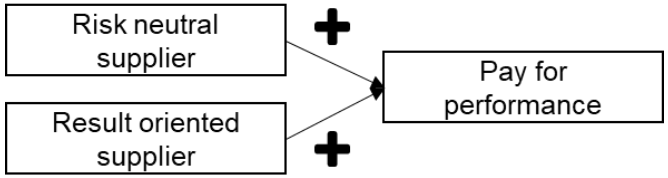
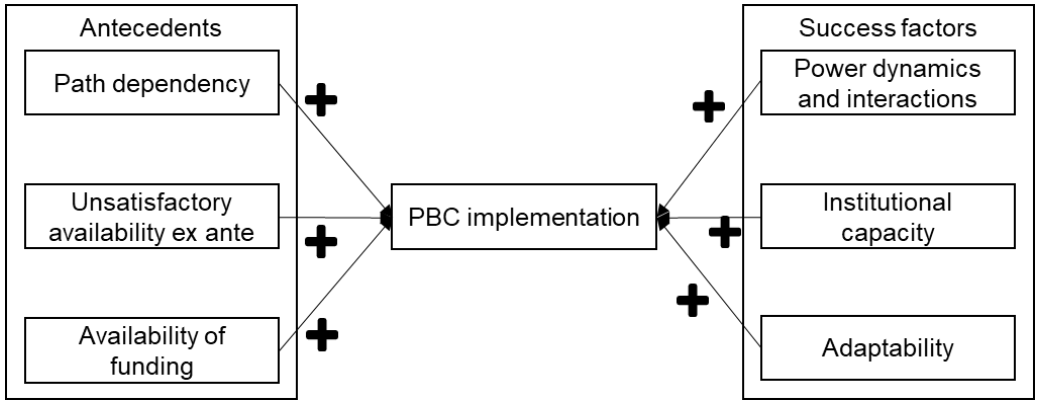
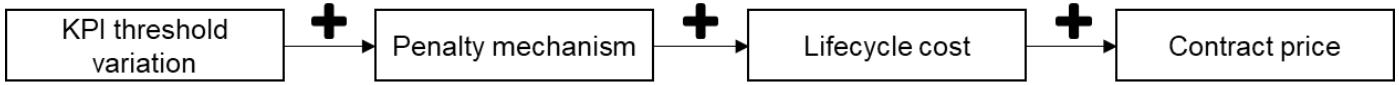
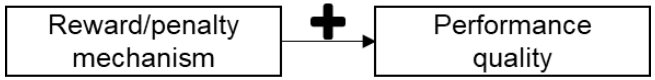
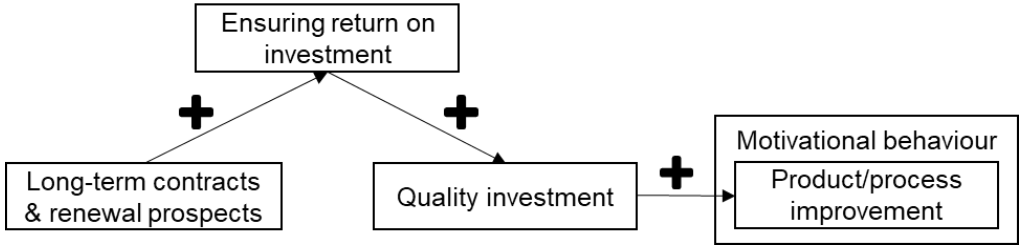
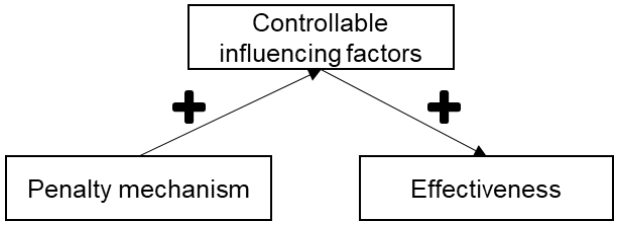
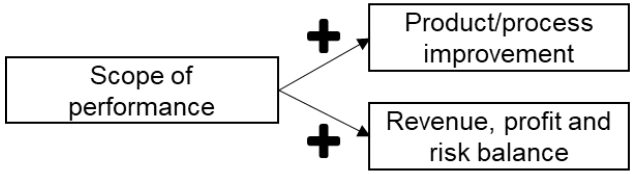
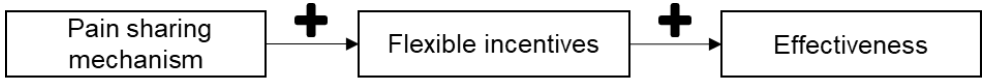
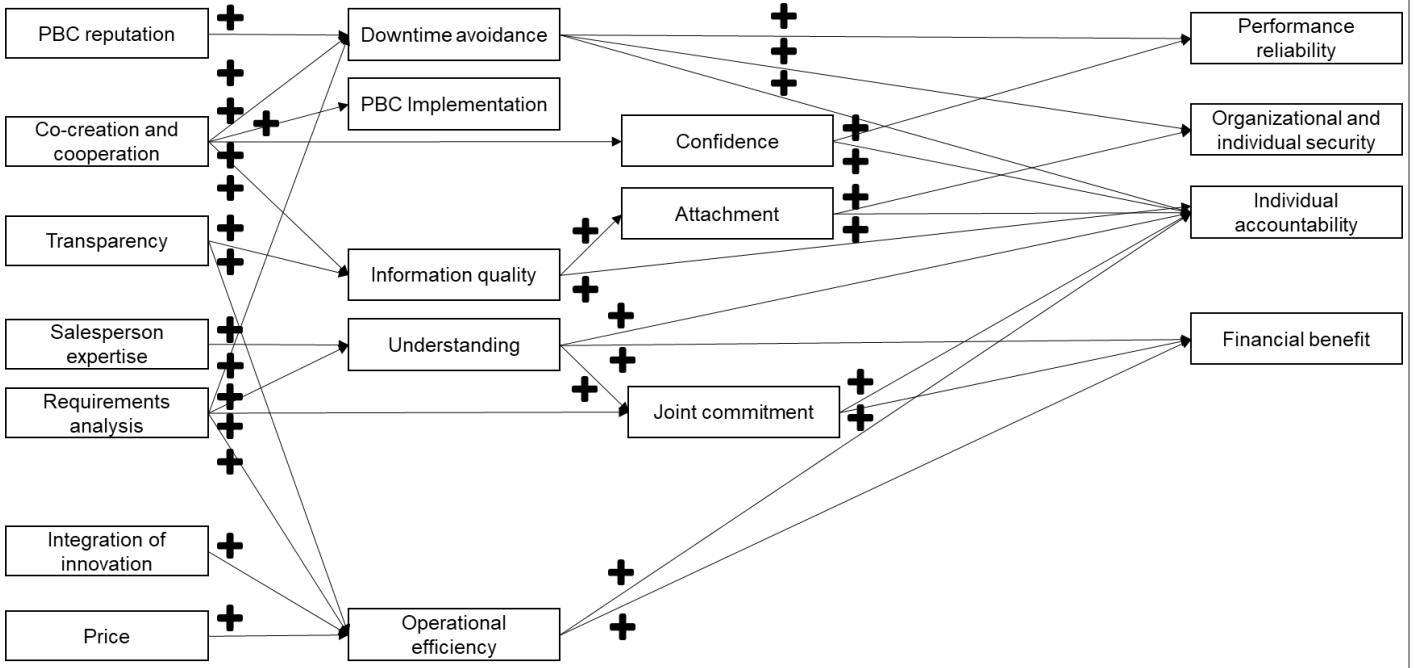
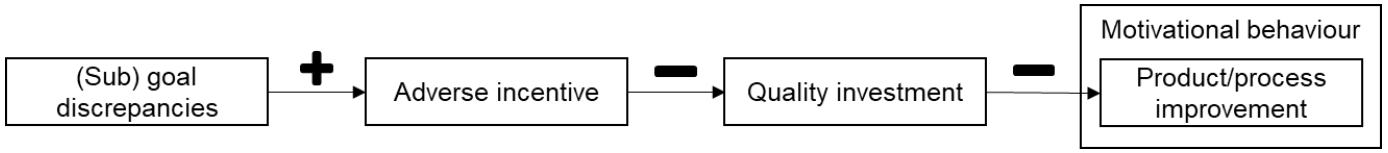
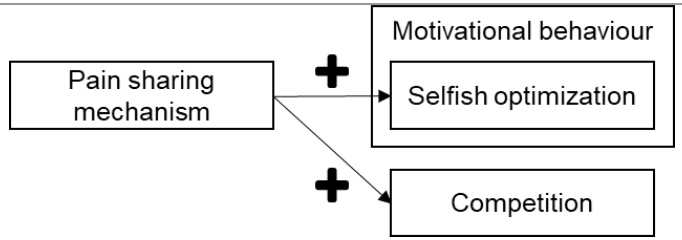
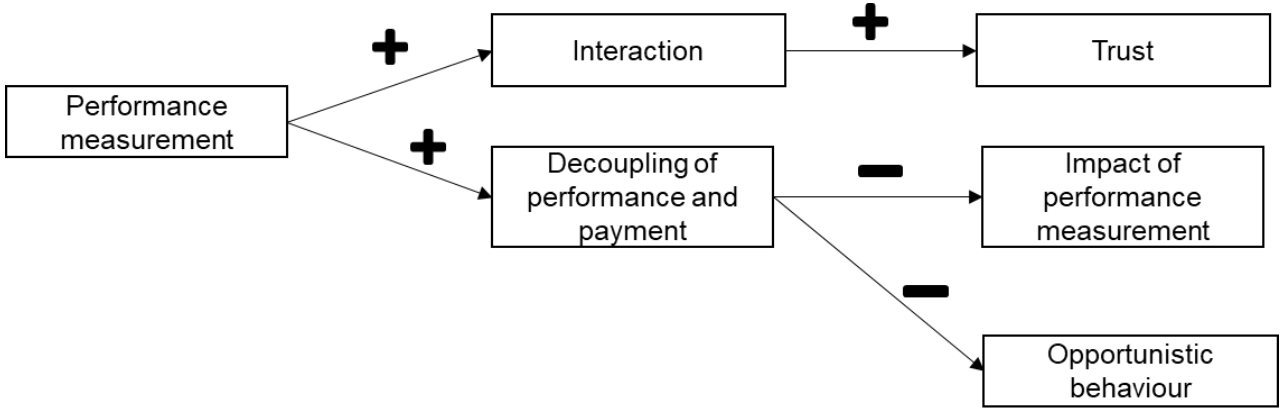
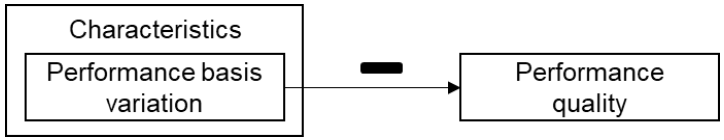
		
69.	Nullmeier et al. (2016)	The greater the extent to which factors beyond the control of buyer or supplier affect service outcomes, the lower the outcome attributability of performance to supplier inputs and effort. The greater the extent to which the buyer assumes the design engineer, production manager, and component supplier roles, the lower the outcome attributability of performance to supplier inputs and effort. The lower the outcome attributability of performance to supplier inputs and effort, the lower the level of supplier inputs and effort. A buyer's effective engagement in monitoring and coordinating activities moderates the relationship between the extent to which the buyer assumes the design engineer, production manager, and component supplier roles and outcome attributability of performance to supplier inputs and effort, such that this negative relationship is attenuated. 
70.	Randall et al. (2015)	Proposition 1a Transformational leadership is positively related to vision Proposition 1b Transformational leadership is positively related to participative safety Proposition 1c Transformational leadership is positively related to climate for excellence Proposition 1d Transformational leadership is positively related to support for innovation Proposition 1e Transformational leadership is positively related to trust Proposition 2a Goal interdependency is positively related to vision Proposition 2b Goal interdependency is positively related to

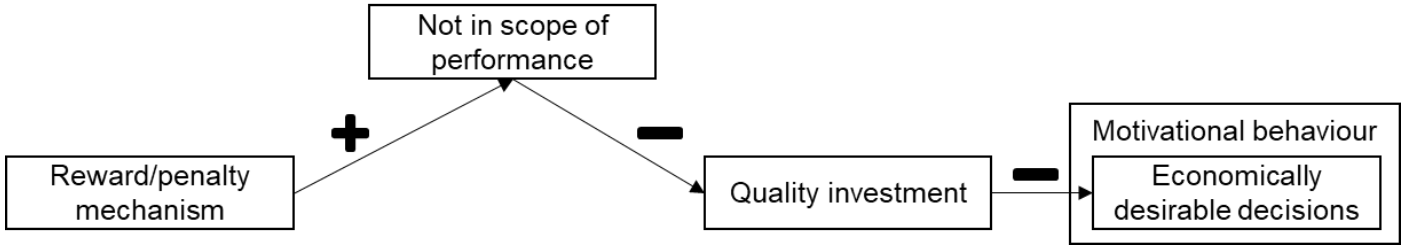
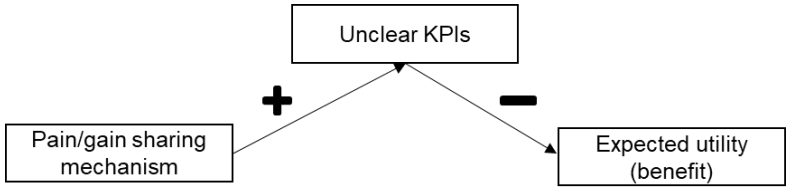
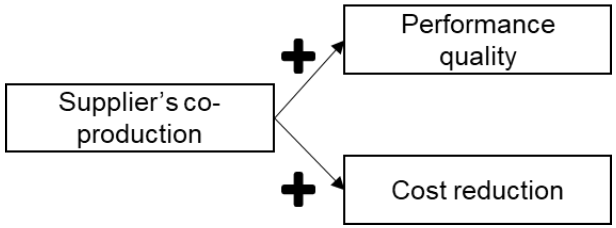
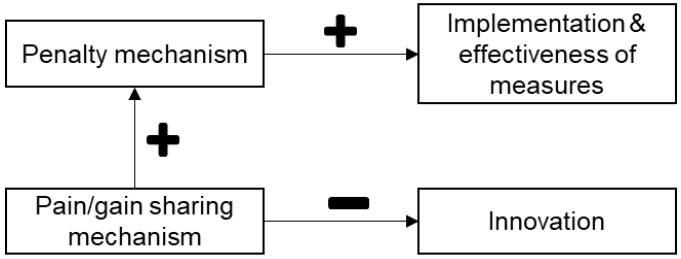
		participative safety Proposition 2c Goal interdependency is positively related to climate for excellence Proposition 2d Goal interdependency is positively related to support for innovation Proposition 2e Goal interdependency is positively related to trust Proposition 3a Vision is positively related to innovation Proposition 3b Participative safety is positively related to innovation Proposition 3c Climate for excellence is positively related to innovation Proposition 3d Support for innovation is positively related to innovation Proposition 3e Trust is positively related to innovation Proposition 4a Means efficacy climate positively moderates the relationship between vision and innovation Proposition 4b Means efficacy climate positively moderates the relationship between participative safety and innovation Proposition 4c Means efficacy climate positively moderates the relationship between climate for excellence and innovation Proposition 4d Means efficacy climate positively moderates the relationship between support for innovation and innovation Proposition 4e Means efficacy climate positively moderates the relationship between trust and innovation Proposition 5 Team innovation is positively related to objective performance Proposition 6 Metric appropriateness positively moderates the relationship between innovation and objective performance Proposition 7 Innovation is positively related to team learning. 
71.	Rungtusanatham et al. (2007)	If a supplier is risk-neutral and result-oriented, then a performance-based contract is suitable. 

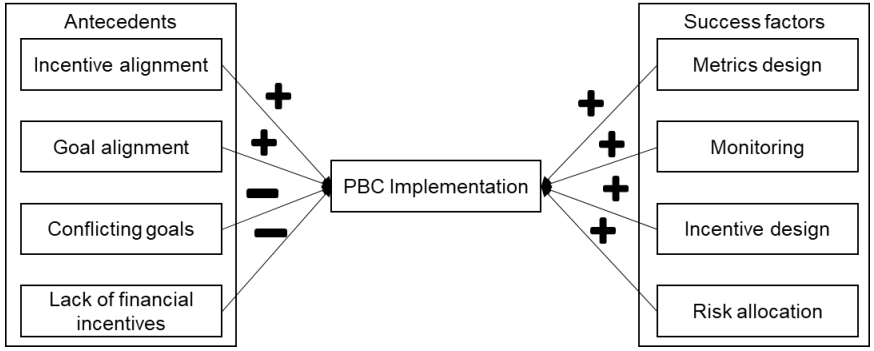
72.	Salehi et al. (2021)	Afghanistan embarked on PBF based on the successful implementation of PBF in Rwanda context. Likewise, PBF was seen as an opportunity to improve the provision of healthcare services rapidly. This finding is in line with other health systems performance studies that the availability of funding was a key factor influencing health policy uptake in LMICs. The MoPH support for PBF adoption was partly linked to their past positive experience of performance-based contracting. The policy process underlying the design and implementation of the PBF programme in Afghanistan was a result of power dynamics and interactions between PBF programme actors. PBF can be successful if actors take on responsibility for the programme. While path dependency can influence policy choice, the capacity of an organisation in implementing a new policy is equally vital. Therefore, it is highly important to ensure adaptability and responsiveness of the PBF programme design to the local context, and the availability of the local capacity to manage the implementation of RBF 
73.	Samra et al. (2017)	Small variations in KPI thresholds can have a significant effect on the overall lifecycle costs (the higher the penalty value is, the higher is the lifecycle cost) and eventual contract price. 
74.	Samra et al. (2017)	Penalties and rewards can be an effective mechanism to ensure suppliers adhere to performance requirements in PBC. 

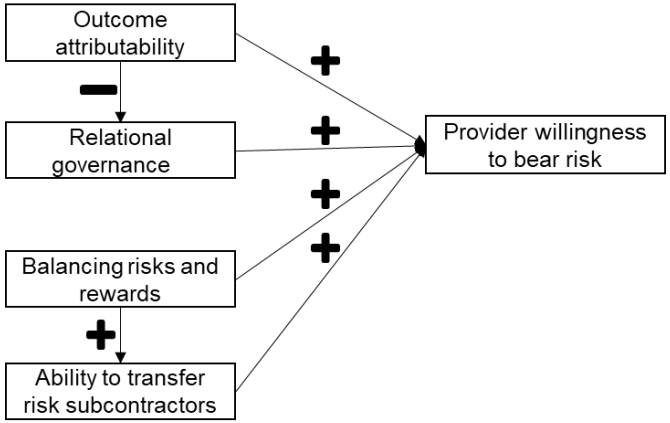
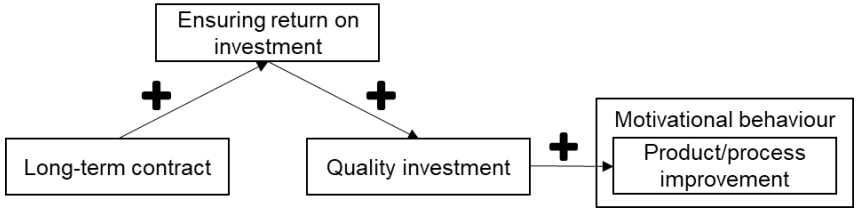
75.	Sanders and Ellman (2018)	Time-based incentives, such as the maximum contract length and the extension mechanism, influence the supplier's decision to invest in process improvements. While a considerable financial investment may result in noteworthy savings or performance enhancements, such benefits may not materialise until several years later. If the contract doesn't endure for that long, then it is not advantageous enough to the supplier. 
76.	Sanders and Ellman (2018)	Penalty mechanisms within financial incentives are effective, providing that outcomes are dependent on factors controlled by both the buyer and supplier. 
77.	Sanders and Ellman (2018)	The greater control the supplier has over the process (in scope-based incentives), the greater potential they possess for enhancing the process, hence facilitating a balance between revenue, profit, and risk. 
78.	Sanders and Ellman (2018)	Flexible incentives are more desirable to suppliers and, therefore, more effective. For instance, cost-sharing mechanisms provide flexibility. 

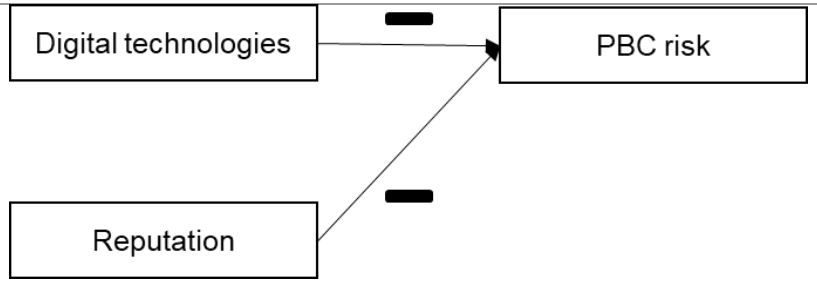
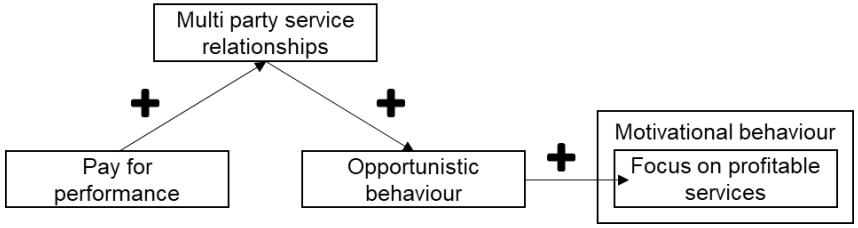
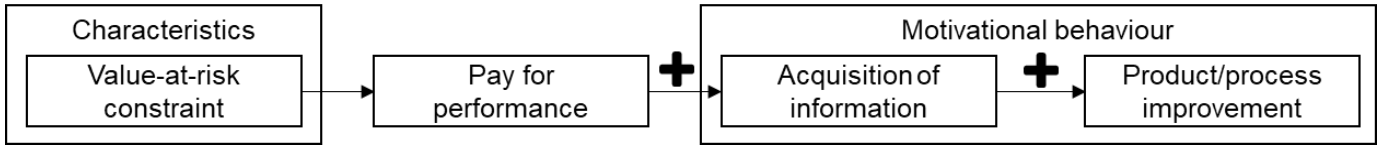
79.	Schaefers et al. (2021)	Based on a means-end chain analysis we find that, in addition to organizational goals, such as reducing costs or ensuring reliable supply, individual goals of the decision-makers also play a key role when purchasing OBCs. Specifically, the risk of being held accountable for problems that may occur in an OBC's implementation and operation emerges as an important concern of decision-makers. 
80.	Scharpff et al. (2021)	The penalty mechanism was intended to motivate suppliers to optimise service (prevent obstacles that lead to maintenance and promote innovative processes), but the actual mechanism penalize delays in delivery. This has the effect of demotivating suppliers to make optimisations. 
81.	Scharpff et al. (2021)	The use of pain share without the gainshare led to competition and selfish optimisation within the network.

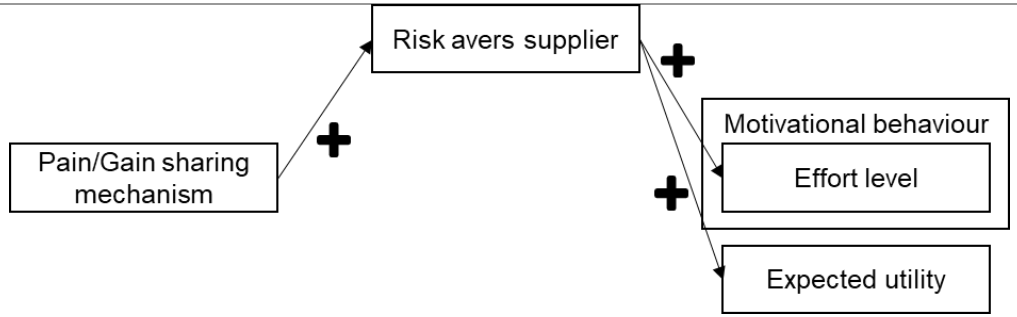
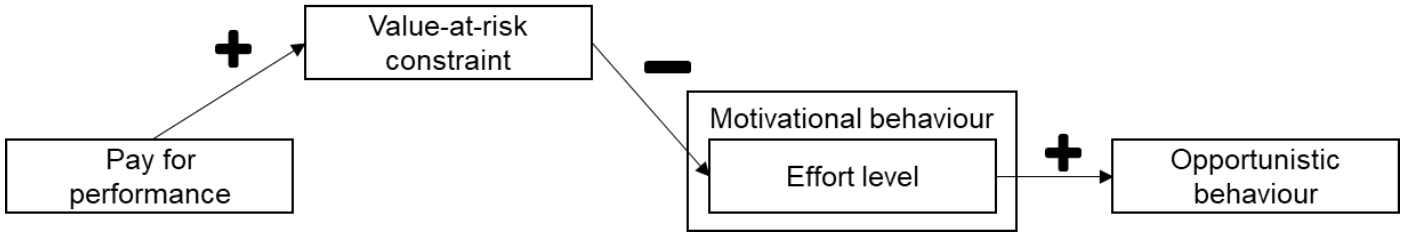
		
82.	Schoenmaker and Bruijn (2016)	If a road agency wants to use PBCs, it has to deal with the influence of the complicating features of maintenance and performance measurement. This leads to a number of inevitabilities. The performance measurement system calls for (ex-post) interaction and a partial decoupling of payment and performance (achievement). The interaction leads to more trust of the contractor in the performance measurement (use and review). The partial decoupling of payment and performance (achievement) reduces the impact of the performance measurement and decreases the propensity towards strategic behaviour of the contractor. 
83.	Selviaridis and Norrman (2015)	If the performance basis (on which the KPIs and financial incentives are calculated) is adjusted upwards every year, this can lead to the required performance quality not being realizable. 
84.	Selviaridis and Norrman (2015)	A financial incentive from a bonus payment to reduce costs in the supply chain that is not proportionate to core performance may mean that additional efforts to improve performance are not economically justifiable.

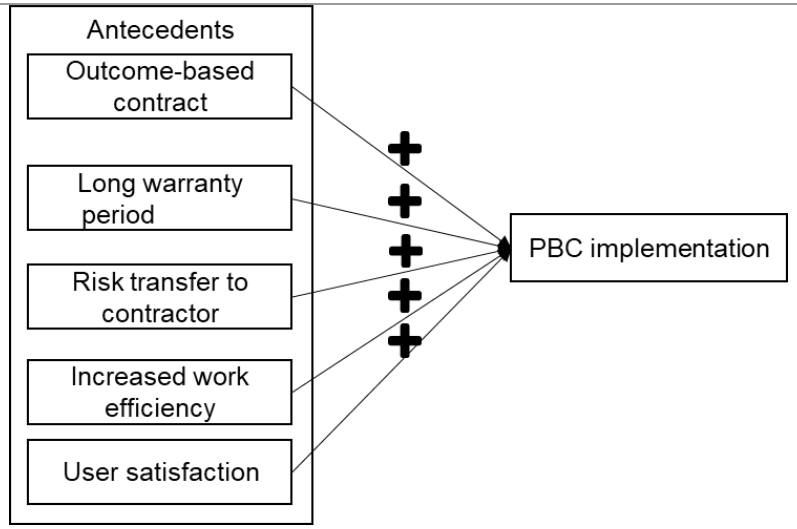
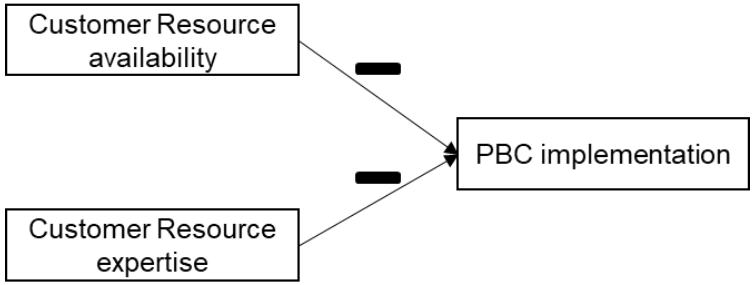
		
85.	Selviaridis and Norrman (2015)	Overlapping KPIs can mean that the cost reductions to be achieved are difficult to calculate and therefore the gain-share model does not achieve the expected benefit and the supplier does not receive its bonus payment. 
86.	Selviaridis and Norrman (2015)	Suppliers' co-production can influence service performance and cost reduction outcomes. 
87.	Selviaridis and Norrman (2015)	The cost savings-sharing mechanism do not produce any innovative ideas of the supplier and only after imposing financial penalty, the supplier recognizes the need to take action. 

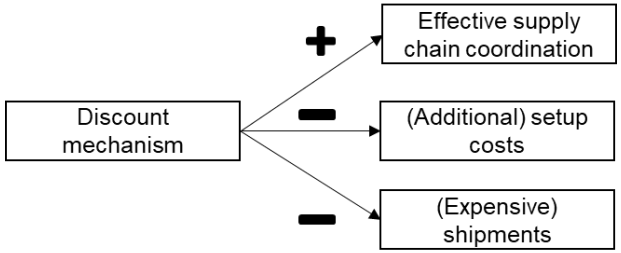
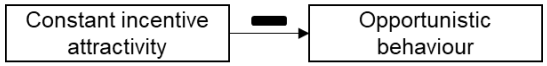
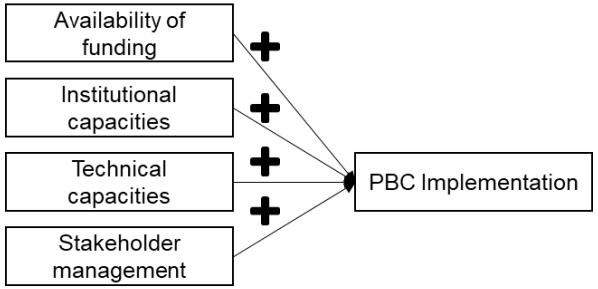
88.	Selviaridis and Norrman (2015)	PBC adoption in two of the cases is driven by the need to align incentives and business goals. In contrast, lack of PBC adoption in LLPCo can be partly explained with reference to the differing business logics and conflicting goals between the provider and its key customers. Customer reluctance to offer bonus payments to the service provider appears to create difficulties in adopting PBC. The study confirms that contract design entails challenges related to setting up performance metrics and monitoring systems (Forslund, 2012) and designing incentive payment systems and allocating risk (Whipple and Roh, 2010). The findings also add to existing studies (e.g. Selviaridis and Norrman, 2014) by revealing specific challenges such as the customer relationship management effects of performance monitoring system design. 
89.	Selviaridis and Norrman (2014)	The lower the attributability of performance to service provider input within the service supply chain, the less willing the service provider is to bear increased financial risk by linking its payment to performance achievement. The lower the reliance on relational governance mechanisms in service provider relations with customers and sub-contractors, the less willing the service provider is to bear risk related to performance based payment. The lower the potential for the service provider to balance risks and rewards related to performance in the service supply chain, the less willing the service provider is to bear risk related to linking its payment to service performance achievement. The lower the potential for transferring risk related to performance in the service supply chain to subcontractors, the less willing the service provider is to accept such risk (transferred to by the customer) by directly linking its payment to service performance achievement. Low attributability of performance to service provider input within the service supply chain is likely to mobilize relational governance mechanisms in provider relations with customers and sub-contractors so as to increase provider willingness to bear PBC-induced risk. The lower the potential for the service provider to balance risks and rewards related to performance in the service supply chain, the less able the service provider is to transfer to sub-contractors the financial risk related to PBC.

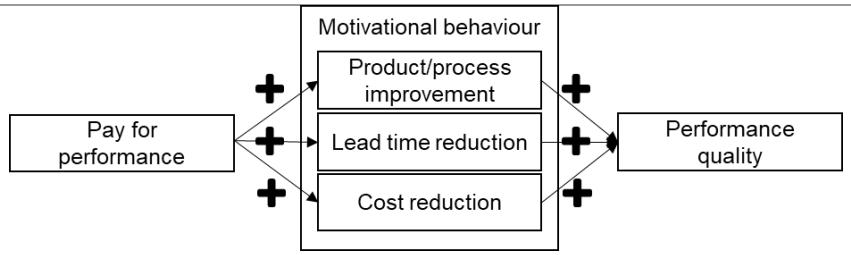
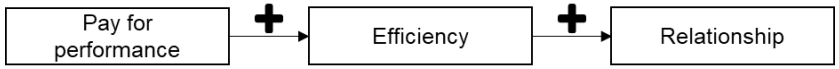
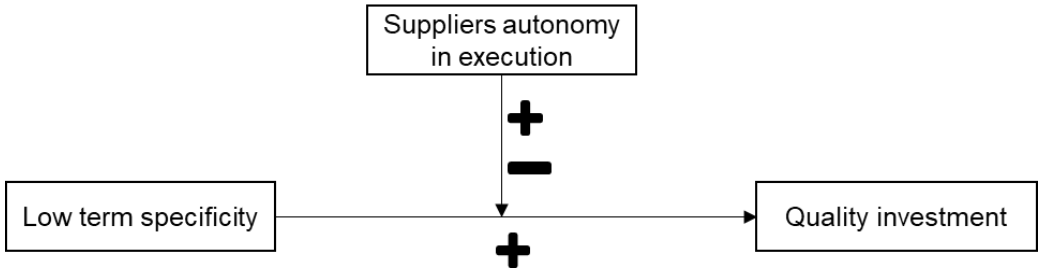
		
90.	Selviaridis and Spring (2018)	Long-term contracts encourage suppliers to invest in product and process improvements. This is because time-based incentives serve as safeguards against buyer opportunism and ensure a return on investment. 
91.	Shanmugam and Dhingra (2023)	Testing of our propositions revealed that these technology assets are complementary and joint ownership is desirable under reputation effects, reputation transfers take place between the contracting parties in the same direction, and continuous reallocation of ownership is required to maintain joint ownership. Rapid technological advancement and industry maturity can gravitate the transaction towards common ownership. The reputation function using Fermi probability distribution in our model is a novel performance measure for the industry.

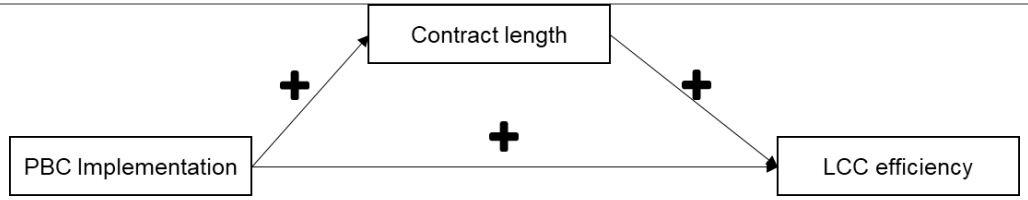
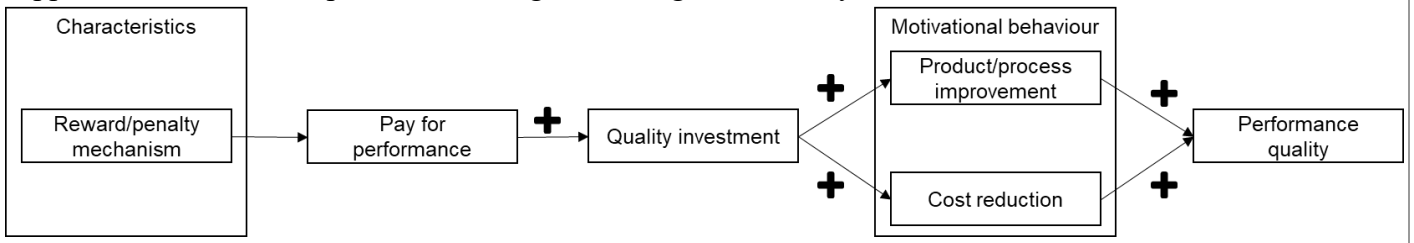
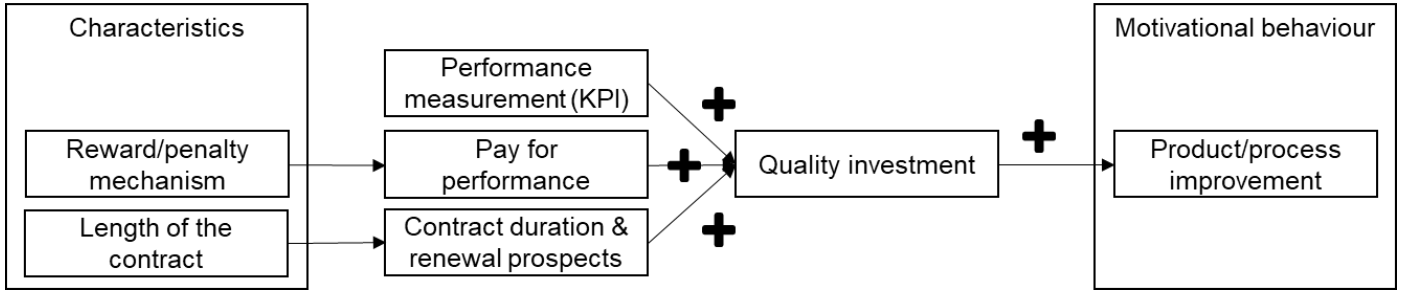
		
92.	Shen (2003)	Financial incentives of PBC generate selection behaviour in three party service relationships (supplier, regulator and customer) because suppliers prefer orders from customers that are less costly and provide the necessary outcome for the financial reward. 
93.	Sheng et al. (2012)	PBC incentives with a value-at-risk-constraint can motivate a supplier to acquire relevant information for performance improvement. 
94.	Sheng et al. (2012)	A risk-averse manager's (supplier's) expected utility and optimal effort levels increase with the return sharing ratio, suggesting that a linear contract (PBC) can not only allocate risks efficiently between the investor (buyer) and the manager (supplier), but also induce the manager (supplier) to work hard.

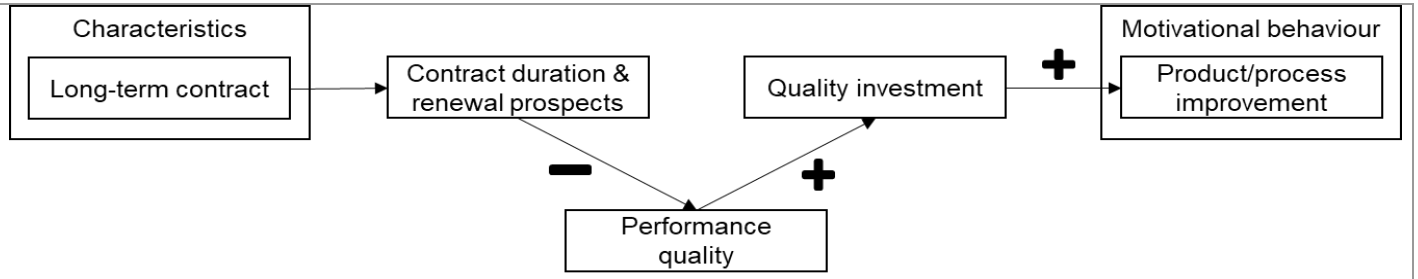
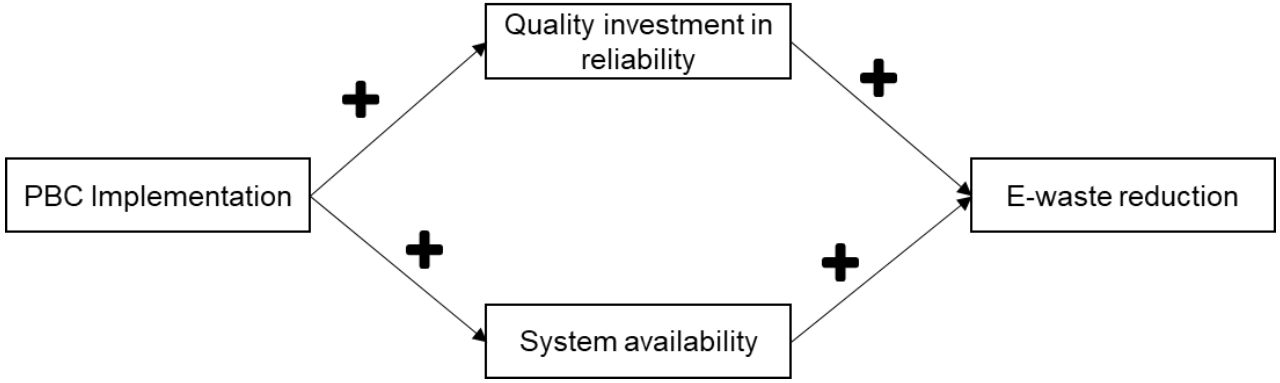
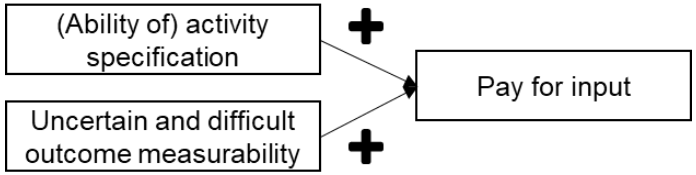
		
95.	Sheng et al. (2012)	In the case of PBC incentives with value-at-risk-constraints, the supplier effort is lower than without a value at risk constraint, which can lead to an increase in moral hazards between the parties (supplier feels safe and may act to risky to increase its performance, which can lead to a disadvantage for the procurer). 
96.	Shrestha and Shrestha (2022)	This study identified the following five important reasons for using the PBC chip-seal method: outcome-based contract, long warranty period, risk share/transfer to the contractor, increased work efficiency, and road-users' higher satisfaction. These reasons are the characteristics of using the PBC method. A number of studies have shown that the reasons for using the PBC method are outcome-based contracts, improved LOS, risk transfer, secure funding for a long time (over 3 years), one contract may include several activities, less chance of cost overrun, and cost saving.

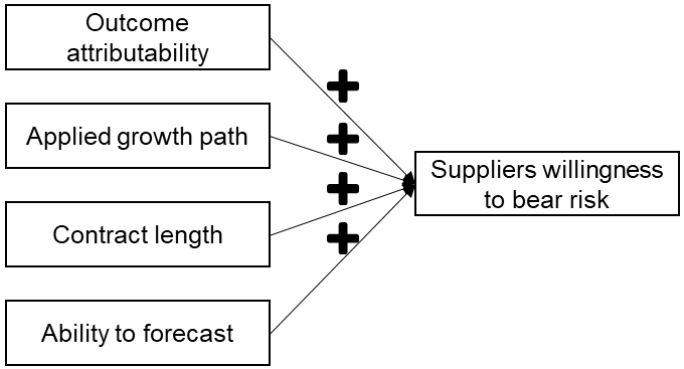
		
97.	Shrestha et al. (2017)	Statistical test results showed that the top two ranked factors influencing the selection of in-house (MBC and PBC) were availability of DOT staff and DOT staff have specific skills for jobs. 
98.	Sirias and Mehra (2005)	Transaction based incentive mechanisms like discount incentive systems are used to effectively coordinate the supply chain. Transaction based incentive mechanisms like lead time-dependent discount is given to the buyer to avoid additional setup costs or expensive shipments on the manufacturing side.

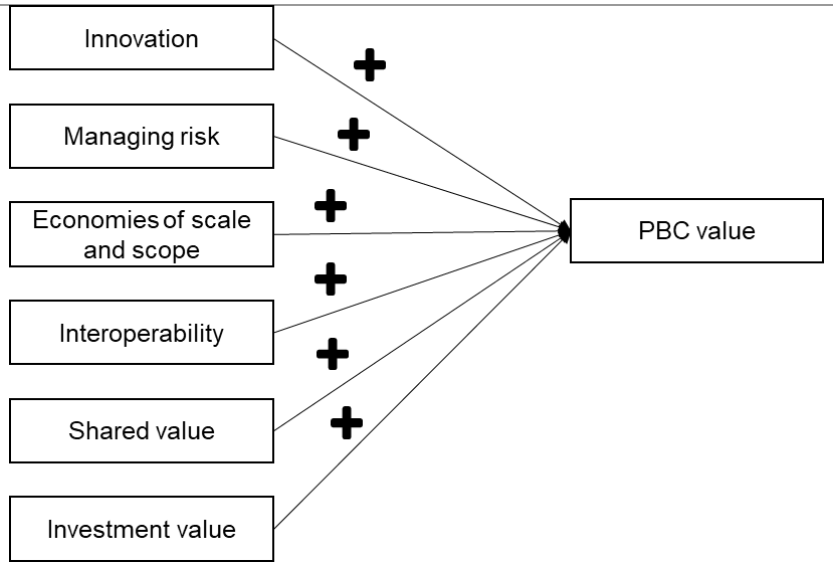
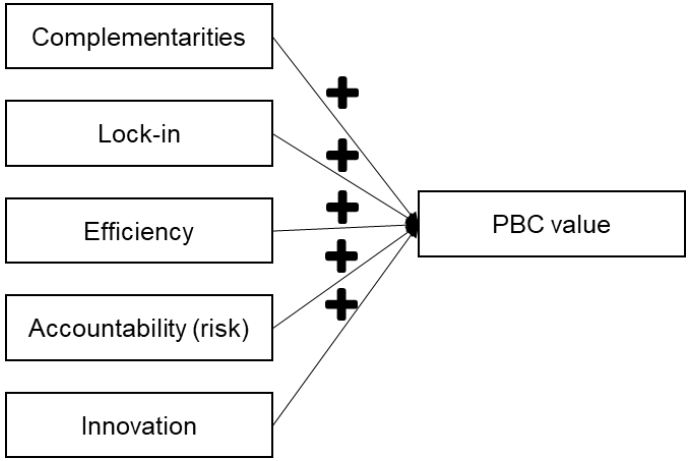
		
99.	Sols et al. (2007)	The attractivity of incentives throughout the entire contract period guarantees suitable motivation throughout the contract's life and minimizes the likelihood of undesirable conduct. 
100.	Ssengooba et al. (2012)	The lessons for those aiming to implement similar interventions are that PBC should not be attempted 'on the cheap', requires a plan to match institutional and technical capacities required of implementers to those that can be marshalled, and requires careful consideration of the likely responses of multiple actors both insiders and outsiders to the intended change process. 
101.	Stenbeck (2008)	Financial incentives of PBC improves quality without cost increase by decreasing delays about 10% and the number of technical errors about 20% (in contrast to traditional unit-price or cost-plus).

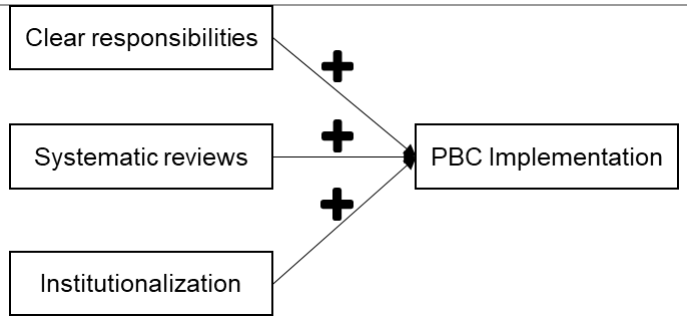
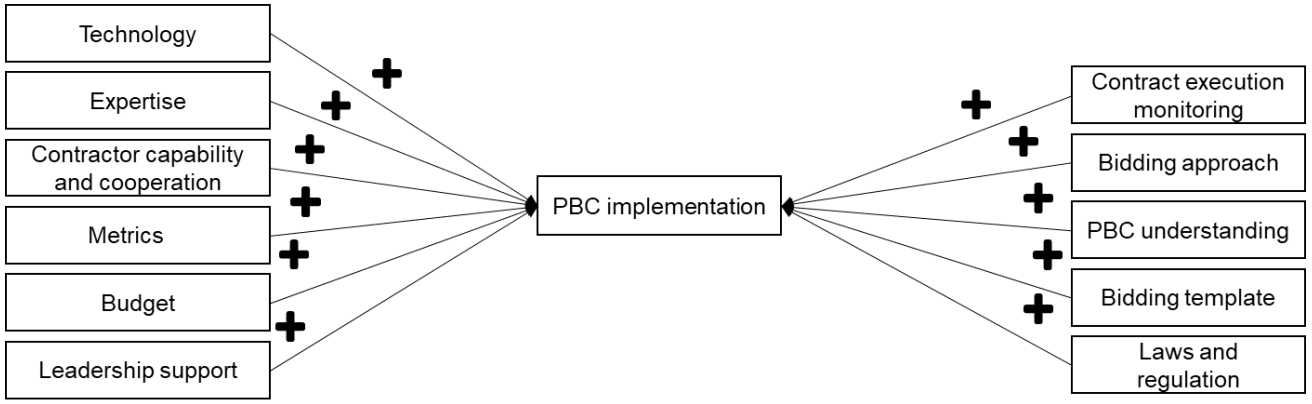
		
102.	Stenbeck (2008)	The (good) relationship between the contract partners does not suffer from the rise efficiency through PBC, the relationship improves. 
103.	Sumo et al. (2016)	Our findings suggest that in both cases, the low degree of term specificity in PBCs (i.e., their openness regarding how to render the contracted services) provides suppliers with autonomy in their daily service operations, which in theory allows them to innovate. However, only one of the suppliers exhibited high innovative performance. Other relevant factors aside, our findings further suggest that a lack of granted autonomy during contract execution is an important factor in explaining the level of supplier-led innovation. Our findings imply that outsourcers that remain too closely involved with the outsourced service delivery and do not allow their suppliers to act autonomously during contract execution limit their suppliers' innovation potential. 
104.	Susanti et al. (2019)	PBC contracts generate a lower LCC compared to traditional contracts. The longer the duration of PBC contracts, there is a tendency for the LCC to decline.

		
105.	Uvet et al. (2022)	Upfront investments in system reliability increases system availability while reducing total service costs. Because with PBC penalty mechanisms the suppliers total costs increase with the penalty costs, that why suppliers invest in better performance to generate high availability rates. 
106.	Uvet et al. (2022)	Financial incentive mechanisms (rewards and penalties), the length of the contract (time-based incentives) and target availability rates (performance measurement) are significant for the supplier's decision to make upfront investments to increase system reliability. 
107.	Uvet et al. (2022)	The availability of the system decreases with an increase in the length of the contract and suppliers are more eager to invest in reliability improvement under longer-term PBC agreements.

		
108.	Uvet et al. (2022)	The findings support the notion that PBC reduces e-waste by increasing system availability, incentivizing upfront investment in reliability growth. 
109.	van der Valk (2023)	If the procurer can accurately describe the supplier's activities and if the measurability of the results to be achieved is uncertain or difficult, then a behavior-based contract that includes remuneration according to milestones and small, clearly specified steps should be utilized. 
110.	van Strien et al. (2019)	The service provider's performance attributability appeared to have a strong impact on its willingness to take PBC-induced risks. For the parts where the service provider did not have full control over the service performance, exclusions and Service Level Agreements (SLAs) were used to manage and mitigate the risks

		associated with uncontrolled performance. The service provider's willingness to accept PBC-induced risks was also affected by its ability to make accurate forecasts, the applied growth path and the length of the contract. 
111.	Visnjic et al. (2017)	Value drivers for Outcome based Maintenance: Complementrity value drivers (Product service system interoparatability, focus on shared value); Lock-in value drivers (long-haul investment value, delivery value loss); Efficiency calue drivers (economies of scale and scope, eliminating friction); Accountability value drivers (Managing and eliminating risks, internalizing unmanageable risk); Novelty value drivers (customer driven innovations, data driven innovations, emergent innovations.

		
112.	Visnjic et al. (2017)	OBM value drivers are complementarity, lock-in, efficiency, accountability and novelty. 
113.	Yang and Chou (2017)	Role definition for parties in ESPCs should be more clear and accountable. A check list should be developed and maintained systematically for reviewing and improving contract template of ESPCs. Performance-based contracting should be institutionalized and implemented for public procurements.

		
114.	Yang et al. (2023)	Based on the criterion of one strategy having three related KSFs, this study concluded that (1) attracting good contractors to participate, (2) setting appropriate performance indicators and thresholds, (3) enhancing the professional ability of the authority staffs, and (4) establishing PBC bidding template documents are the most valuable strategies among all KCSs. 
115.	Zeithaml and Zeithaml (1984)	Relational incentive mechanisms like market and critical resource access can be motivative. 

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