

Trust influencing factors in main contractor and subcontractor relationships during projects



Emmanuel Manu ^{a,*}, Nii Ankrah ^a, Ezekiel Chinyio ^a, David Proverbs ^b

^a *University of Wolverhampton, UK*

^b *Faculty of Computing, Engineering and the Built Environment at Birmingham City University, Birmingham, UK*

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Abstract

Trust is crucial for achieving optimum benefits from supply chain integration and collaboration in the construction sector. Yet relationships between main contractors and subcontractors continue to be influenced by issues that promote vicious circles of distrust. This research investigates the trust influencing factors in main contractor–subcontractor relationships on projects. Empirical data was gathered from across four case studies through semi-structured interviews, non-participant observations and document reviews, and analysed using thematic analysis. Findings revealed that the change management process, economic climate, payment practices, perceptions of future work opportunities, job performance and the project-specific context influence trustfulness and trustworthiness of the different parties. The findings also imply that stronger trust in the main contractor's supply chain can only be realised and sustained through promotion of trustworthiness-induced rather than benefit-induced trustfulness. © 2015 Elsevier Ltd. APM and IPMA. All rights reserved.

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1. Introduction

Relationships between main contractors and subcontractors continue to be influenced by problems such as unfair and late payments, poor health and safety (H&S) standards and substandard workmanship (Arditi and Chotibhongs, 2005), all of which contribute to the lack of trust on projects (Dainty et al., 2001). However, inter-organisational trust in project-based environments continues to be linked with reductions in transaction cost as a result of lesser dependence on powerful and costly control systems (Zaghloul and Hartman, 2003). Due to the high uncertainties in project based environments, firms are also able to respond to new information and approach work in a flexible manner when relationships are driven by trust, thus

contributing to significant time and cost savings (Swan et al., 2002). Project actors are also less likely to withhold information deliberately and act against the interest of the overall project when relationships are trust driven, hence resulting in open and reliable flow of information (McDermott et al., 2004).

Establishment of trust in construction can however be a daunting task (Wong et al., 2005) and difficulties in securing optimum benefits from supply chain integration and collaboration efforts in the UK construction sector have mostly been attributed to deficiencies in trust (see Akintoye and Main, 2007; Akintoye et al., 2000; Dainty et al., 2001). Whilst trust remains essential for achieving flexibility and ensuring that information flows reliably throughout the supply chain (Swan et al., 2002), challenges still persist as to how trust-based collaborative relationships can be realised and sustained, particularly between main contractors and subcontractors. There continues to be a lack of in-depth understanding about the main issues that undermine trust between main contractors and subcontractors as well as how these can be overcome. For example, there are still debates as to

* Corresponding author. Tel.: +44 1902 321271; fax: +44 1902 322743.

E-mail addresses: E.Manu@wlv.ac.uk (E. Manu), Nii.Ankrah2@wlv.ac.uk (N. Ankrah), E.Chinyio@wlv.ac.uk (E. Chinyio), David.Proverbs@bcu.ac.uk (D. Proverbs).

how to promote fair payment practices in the UK construction supply chain — a persistent source of distrust in main contractor–subcontractor relationships (see CIOB, 2014; Nichol, 2014).

Despite the trust-related problems that manifest in main contractor–subcontractor relationships, subcontracting still continues to account for between 70 and 90% of construction works by contract value (Chiang, 2009; Hartmann and Caerteling, 2010). Thus interest on how construction supply chains can be collaboratively managed continues to grow, particularly with evidence from the manufacturing sector on how the use of alliance-type arrangements has enhanced business performance (Love et al., 2002). Walker (2007) reiterated the need to integrate both upstream and downstream firms that contribute to the construction process and in particular, making it possible for subcontractors and suppliers to contribute to design, programming and other areas of collaboration. Similar performance improvement targets and visions have also been set for the construction sector in the UK, with the Construction 2025 Strategy Report advocating that future growth opportunities can be exploited through early engagement of the supply chain in design development and collaboration through building information modelling (BIM) implementation (Department for Business Innovation and Skills, 2013a,b). However, for these industry visions to be fully realised, a trust-based collaborative environment is required to facilitate high levels of information sharing and to secure commitments of the supply chain from the very early stages of a project. Hence, significant research attention is still required on how to achieve trust-based collaboration in the construction supply chain.

Currently, much of the empirical research work on trust is dominated by a focus on improvements in client and main contractor relations through the use of collaborative procurement procedures and contracts (Eriksson and Laan, 2007; Laan et al., 2011; Pinto et al., 2009; Wong et al., 2005), with limited empirical synthesis on trust development at the main contractor and subcontractor interfaces of the construction supply chain. This study therefore sought to interrogate this important line of empirical inquiry. The main objective was to explore the factors that influence trust development in main contractor–subcontractor relationships, and to identify strategies that could help improve upon trust-based collaboration within this context of the construction supply chain. To achieve this objective, literature on subcontracting in construction and the concept of trust and its development are firstly reviewed. Based on these reviews of the literature, a research question is posed on the key issues that influence inter-organisational trust development between main contractors and subcontractors on projects. This is followed by an account of the research methodology and empirical findings that provide basis for drawing conclusions to the study.

2. Subcontracting and its ramifications

Data from the UK construction statistics annual (Office for National Statistics, 2013) indicates that out of the 247,105 construction firms that were registered in the UK in the third

quarter of 2012, only 2.1% employed more than 25 personnel, with 17.3% operating as sole ownership firms whilst another 36.7% employed only one personnel. This demonstrates the extent to which the UK construction sector in particular is heavily reliant on small firms that often find work as subcontractors under a main contract. This entrenched nature of subcontracting in the construction sector is partly due to the specialist nature of most construction works (Yik et al., 2006) and the strategic choice by large construction firms to emphasise flexibility as a source of competitive advantage (Winch, 1998). Manu et al. (2013b) indicated that the reasons for prominence of subcontracting practice in construction are the ability to fine-tune labour flexibility, bargain down labour cost, encourage quicker completion of tasks, externalise less rewarding and dangerous activities, transfer financial risk, avoid workers' compensation cost, and rapidly meet changing product market demands. Despite the undisputed contribution of subcontracting to organisational and managerial flexibility as well as provision of specialised services, the management of relationships between main contractors and subcontractors during projects can be quite complex and problematic.

Traditionally, price has been the main mechanism for coordinating transactions between contracting parties although this transaction approach is often challenged because it ignores social and relational aspects of the transaction process (Kale and Ardit, 2001). According to Kale and Ardit (2001), firms become socially embedded in ongoing transactions as a result of relational experiences that develop over time. These prior relational experiences promote the diffusion of information about qualities and probable behaviour of an opposite party in a transaction, and hence serve as a safeguarding mechanism as to which parties should be avoided or selected. The already established routines, trust, values and relational norms also contribute to inter-organisational learning, which enhances coordination of the transaction (Kale and Ardit, 2001). Main contractors would therefore have to carefully arrive at a trade-off in the priorities they place on either price-driven (market) or trust-driven (relational) governance mechanisms during transactions with subcontractors (Hartmann and Caerteling, 2010).

Cox and Ireland (2002) argue that to select from a range of relationship management choices available to firms in the construction supply chain, the power circumstance between buyers and suppliers would have to be properly understood. Whilst the natural tendency would be to manage discrete transactions with arms-length relationships that are price driven, the shift towards long-term collaborative relationships would be determined by the extent to which parties have to work closely together to maximise profit or satisfy other alternative goals (Cox and Ireland, 2002). The extent to which the product or service is standardised or commoditised, number of alternative suppliers available to the buyer, number of alternative buyers available to the supplier, switching costs for both buyers and suppliers and the level of information asymmetry advantage that one party has over the other; are all factors that determine the power position of a firm in the supply chain. Based on a firm's power position, the most economical

governance mechanism would be selected for a transaction (Cox and Ireland, 2002). Williamson (1979) categorised transactions based on the level of uncertainty, transaction frequency and the degree to which transaction-specific investments are required, with idiosyncratic transactions involving highly customised products or specialist services that demand transaction-specific human capital investments. Relationally derived safeguards become of most importance when transactions are idiosyncratic in nature (Williamson, 1979).

For complex and highly commoditised work packages where the main contractor depends mainly on the specific knowhow of a subcontractor (human asset specificity), the main contractor may have to rely – far beyond price considerations – on firms with whom they have established prior relationships. Also, the bounded nature of human rationality can make it practically impossible to envisage all uncertainties on a project, with increased potential for opportunistic behaviour to be displayed by the parties (Williamson, 1979). Additional safeguards that go beyond price mechanisms and carefully drafted contract documents, are therefore required to carefully coordinate such idiosyncratic transactions. It is for such transactions that the extent of inter-organisational trust that exists between main contractors and subcontractors becomes of considerable importance. To promote such relational safeguards, main contractors have sought to employ alliancing and other supply chain management approaches for sustaining long-term relationships with subcontractors that undertake work packages of an idiosyncratic nature. Through such arrangements, they can work together to promote inter-organisational learning and trust on projects, which according to Kale and Ardit (2001), can translate into a main contractor's economic profitability and overall performance.

But despite main contractor efforts to promote trust-based relationships with subcontractors, there are still unsavoury practices and perceptions of opportunistic behaviour held by both parties, that continue to hinder collaboration in the supply chain relationship. Dainty et al. (2001) revealed a held belief amongst subcontractors that main contractors enhance profitability at their expense by passing down risks without any acknowledgement of their business requirements and profitability. Late payments, charging fees to tender for work, award of contracts based on cheapest price rather than best value, suicide bidding (both in the case of main contractors and subcontractors) and demand for retrospective discounts and cash rebates (Arditi and Chotibhongs, 2005), are still typical practices that manifest in transactions between main contractors and subcontractors. Additionally, subcontractors can also be faced with unlimited liabilities in the event of project delays as there is often no pre-ascertained liquidated damage proportionate to the level of risk they pose (Greenwood et al., 2005). These unfair practices often become severe during economic downturn periods, with Knutt (2012) reporting that some main contractors seek to improve margins by squeezing the supply chain through delayed payments. Such practices create a contractual rather than relational environment, making subcontractors suspicious about the main contractors' intention to genuinely promote trust-based collaboration in the supply chain relationship.

Conversely, subcontractors can lack the capacity to adopt modern quality management practices, and fail to embrace technological advancements or invest in human resource development (Hsieh, 1998; Lin and Gibson, 2011), all of which have a negative impact on the supply chain relationship. Subcontractors are also subject to high staff mobility, consequently promoting a negative attitude towards staff training (Lin and Gibson, 2011), and a limited time frame for trust to develop with specific individuals. Inefficient communication, subcontractor insolvency, and substandard work quality are also other consequences of subcontracting that negatively impact on the supply chain relationship (Love and Li, 2000; Yik et al., 2006), with poor communication and lack of a common understanding between main contractors and subcontractors during one-off type projects cited as a key reason for poor quality work (Chiang, 2009; Lin and Gibson, 2011; Yik et al., 2006). Poor health and safety compliance by subcontractors (see Ankrah, 2007; Ardit and Chotibhongs, 2005; Chiang, 2009; Manu et al., 2010), particularly subcontractors' disregard for H&S regulations, also impact negatively on the supply chain relationship. These subcontractor related problems can also influence the extent to which sustained supply chain relationships and any associated improvements in performance can be achieved on projects.

Despite these numerous problems, integration between main contractors and subcontractors remains key to achieving any productive collaboration in the supply chain (Kumaraswamy et al., 2010) and its realisation would arguably be derailed if trust related problems continue to persist. A trust-based environment where both parties have the confidence that their various expectations would be expertly met is required to maximise collaboration and integration benefits whilst ensuring that the necessary commitments are demonstrated towards the achievement of project objectives. There is therefore the need to investigate the trust development process between main contractors and subcontractors so as to understand better, the factors that undermine trust in their relationship. Ultimately, this can be helpful in deriving strategies for overcoming such problems whilst enhancing subcontractor contributions towards innovation and long-term value creation in the supply chain.

3. The concept of trust and trust development

Trust is a psychological state that enables a party to accept vulnerability based on positive expectations regarding the intentions and behaviours of other parties (Costa and Bijlsma-Frankema, 2007; Das and Teng, 2001; Dekker, 2004; Mayer et al., 2007; Rousseau et al., 1998; Weibel, 2007). Trust is influenced by factors that underpin the formation of such positive psychological expectations. Some (e.g. Hieronymi, 2008; Holton, 1994; Lewicki et al., 1998) argue that positive psychological expectations can be founded on faith or belief in a party's word or promise whilst others suggest that it can derive from perceived benefits or losses associated with trusting decisions (Gambetta, 2000) or awareness of punishments that exist should a party decide to act opportunistically (Williamson, 1993). However, from a purist perspective, trust

is weaker when it is mainly motivated by the value, benefit or importance of a trusting response, given that such reasons are only to supplement a perceived lack in the trustee's trustworthiness (Hieronymi, 2008). Trustworthiness is the inherent attribute of a trustee (object to which trust is directed) such as their credibility, benevolence, competence or integrity (Mayer et al., 2007). Purist notions of trust are therefore restricted to only reasons that bear on the innate trustworthiness of a trustee rather than other contextual circumstances that can motivate trusting decisions.

The development of trust is however a much more complex process that is not only limited to perceptions of trustworthiness or even the contextual environment within which a relationship is constituted but can also be linked to the trustfulness of the trustor (Mayer et al., 2007; Tullberg, 2008). Trustfulness relates to the ease or difficulty with which a trustor (being the subject of trust) willingly accepts vulnerability (Tullberg, 2008). These two aspects of trust formation i.e. trustworthiness and trustfulness, also have implications for understanding the two apparently contradictory approaches that have been applied to inter-organisational trust research — a micro-level psychological and a macro-level institutional approach (Laan et al., 2011).

Micro-level psychological approaches often take an intrinsic (endogenous) view that focuses on the emergence of trust through interaction and other innate characteristics of the trustor or trustee i.e. trustfulness and trustworthiness. Macro-level approaches encompass other situational factors that are exogenous to the relationship e.g. incentive and punishment mechanisms. Whilst it is argued that an integrated approach be applied to the study of trust because it is clearly not only influenced by individual factors i.e. moods, emotions, attitudes, values and identity (micro-level factors) but also other contextual and situational macro-level factors (Bhattacharya et al., 1998; Phua, 2013), Bachmann and Inkpen (2011) lamented that as yet, the role of institutions in trust formation is not properly understood. This was attributed to an overemphasis on interaction-based sources (micro-level approach) of trust.

In the construction sector, some institutional mechanisms such as supply chain management, alliancing and partnering have been associated with higher levels of trust. McDermott et al. (2004) indicated that procurement and institutional frameworks that allow for greater information flows, focus on relationships rather than contractual or financial elements, promote longer-term relationships and reduce the level of uncertainty with regard to final payments; engender higher levels of trust. Eriksson and Laan (2007) also revealed that procurement procedures that focus on price through output control and authority through process control are detrimental to trust formation. Relational contract forms have also emerged as a stimulus for project environments that promote trust, with an increase in usage of collaborative contracts such as the PPC 2000, NEC3 and the JCT Constructing Excellence contracts. These contracts seek to promote trust-based collaboration during projects (Khalfan et al., 2007). For example Clause 10.1 of the NEC3 contract has an express clause which stipulates that the contracting parties should act in a spirit of mutual trust and cooperation. To realise this, project

management tools such as the early warning procedure, risk reduction meetings and compensation event schemes are incorporated into the contract so that the different parties have the confidence that problems would be jointly dealt with as soon as they arise.

But there is still the need for deeper understanding of how innate and institutional factors influence trust formation in relationships between main contractors and subcontractors and in particular how these influence their respective trustworthiness and trustfulness. Is trust development between main contractors and subcontractors driven by mostly innate or institutional factors or both? To explore this further the main research question that was posed in this study was: *How does inter-organisational trust develop between main contractors and subcontractors during projects?* A sub-research question that derived from the main research question, which this present paper focuses on was: *What factors influence trustfulness and trustworthiness of main contractors and subcontractors during projects?* An exploratory study of the issues that influence the trustworthiness and trustfulness of both parties could provide better understanding that can contribute towards efforts to mitigate trust-related problems in main contractor–subcontractor relationships.

4. Research methodology

To generate insights into factors that influence trustfulness and trustworthiness of main contractors and subcontractors, case studies were conducted on four projects where the main contractors had subcontracted substantial amounts of their workload. For reasons of confidentiality, these contractors are hereafter referred to as Alpha, Beta, Delta and Gamma. The case study approach was employed because it allows for in-depth exploration of complex processes within a natural context as well as triangulation of evidence from multiple sources (Proverbs and Gameson, 2008; Yin, 2013). The research also drew on the interpretivist epistemology, which enabled complex subtleties of the trust development process to be understood through interpretation of multiple realities from the different parties during the projects i.e. main contractors and subcontractors. This ability to explore trust development from within the natural context is highly important (Bijlsma-Frankema and Costa, 2005), with case studies particularly being the most suitable strategy as boundaries between the trust development process and the project environment can be fuzzy (Yin, 2013). Data was obtained through interviews, non-participant observation and document reviews. Altogether, 39 in-depth face-to-face interviews were conducted with key interviewees from across the four cases (see Table 1), with each interview lasting approximately 60 min.

The interviews broadly focused on the main contractor's supply chain management strategy and how this influenced inter-organisational trust during the project. Aspects of the findings being reported in this study however relate to interview questions on who was being trusted, factors that underpinned positive or negative psychological expectations and what was expected from the opposite party in order for them to be trusted. To elicit interview responses from key main

Table 1
Data collection across the four case studies.

	Alpha	Beta	Delta	Gamma
Semi-structured interviews	(1) supply chain manager, (3) contractor project personnel and (7) subcontractor personnel	(1) chief quantity surveyor, (2) contractor project personnel and (4) subcontractor personnel	(1) procurement leader, (6) contractor project personnel and (5) subcontractor personnel	(1) procurement manager, (2) contractor project personnel and (6) subcontractor personnel
Non-participant observations	Two (2) pre-start meetings	X	One (1) subcontractor performance review meeting	X
Documentary analysis	Project and organisational profile documents, subcontractor procurement guidelines	Project and organisational profile documents, supply chain policy document	Project and organisational profile documents	Project and organisational profile documents, supply chain management strategy document

X: was not possible to conduct due to access restrictions.

contractor and subcontractor personnel, an interview guide was employed across the four case projects. The questions were not directly on how trust developed or on trustfulness and trustworthiness but rather on their respective expectations in regard to the opposite parties and how such expectations emerged and changed in the course of the project. Key questions that were posed to interviewees were: i) what expectations do you have of the main contractor/subcontractors on this project?, ii) where do these expectations in the main contractor/subcontractor emerge from/what underpins your expectations?, and iii) have your expectations in the main contractor/subcontractor changed in the course of the project and why if this has been the case? Interviewees were also asked to elaborate upon their responses with actual incidents that had transpired in the course of the projects. It was envisaged that from these responses, factors that influence both trustworthiness and trustfulness of main contractors and subcontractors would be uncovered.

On each project, at least two main contractor personnel – one from the commercial side and the other from the construction side – were interviewed so as to bring to the fore their different perspectives. With the subcontractors, project based representatives such as contract managers, operations managers and quantity surveyors were selected for interviews as they were best placed to provide adequate and authoritative insights into these trust development issues. Document reviews were also undertaken to obtain important background

information on the case-study projects, which is summarised in Table 2. Non-participant observations were also used on projects Alpha and Delta to gauge the project team's expectation regarding performance and competence of subcontractors. The four case projects (see Table 2) presented different situational characteristics, which were also useful for interpretation of the findings.

The interview transcripts, word-processed observation notes and documentation from across the four cases were integrated onto a single platform using the qualitative data analysis software QSR NVivo. The three-pronged qualitative data analysis strategy proposed by Miles and Huberman (1994) was adopted for within-case and cross-case analysis i.e. data reduction, data display and conclusion drawing or verification. The data reduction process involved sorting, focusing, discarding and organisation of large text segments which were assigned to emergent codes (free nodes). These codes were either derived from within the data (in-vivo codes), through conceptual sense-making or from literature insights, reflecting the assignment of labels to text based on descriptive or inferential meanings (Bryman and Burgess, 1994; Miles and Huberman, 1994). The free nodes were further clustered under themes, sub-themes and categories to depict emergent patterns. As illustrated in Fig. 1, one of the main themes that emerged from this analytical process was on the manifestation of trust in the main contractor's supply chain. This theme comprised of three sub-themes i.e. nature of trust, attributes of trust and

Table 2
Case study project characteristics.

	Project Alpha	Project Beta	Project Delta	Project Gamma
Nature of project	Construction of offices	School construction	School construction	Waste recovery station
Nature of works	Refurbishment and new-build	Refurbishment and new-build	New build plus demolition	Demolition, new build and refurbishment
Type of client	Public client	Public client	Private and public	Private and public
Mode of contractor selection	Competitive tender	Negotiation	Competitive tender	Negotiation
Procurement route and contract form	Design and build with NEC 3 contracts	Framework agreement with NEC3 contracts	PFI with bespoke PFI contracts	Design and build with JCT contracts plus bespoke amendments
Project duration and status	15 months with 55% complete at month 9	12 months with 65% complete at month 8	25 months with 65% complete at month 10	17 months with 35% complete at month 5
Contract sum	£ 30.5 million	£ 2 million	£ 21 million	£ 13 million
Number of subcontractors	29	30	33	50

JCT: joint contracts tribunal; NEC: new engineering contract; PFI: project finance initiative.

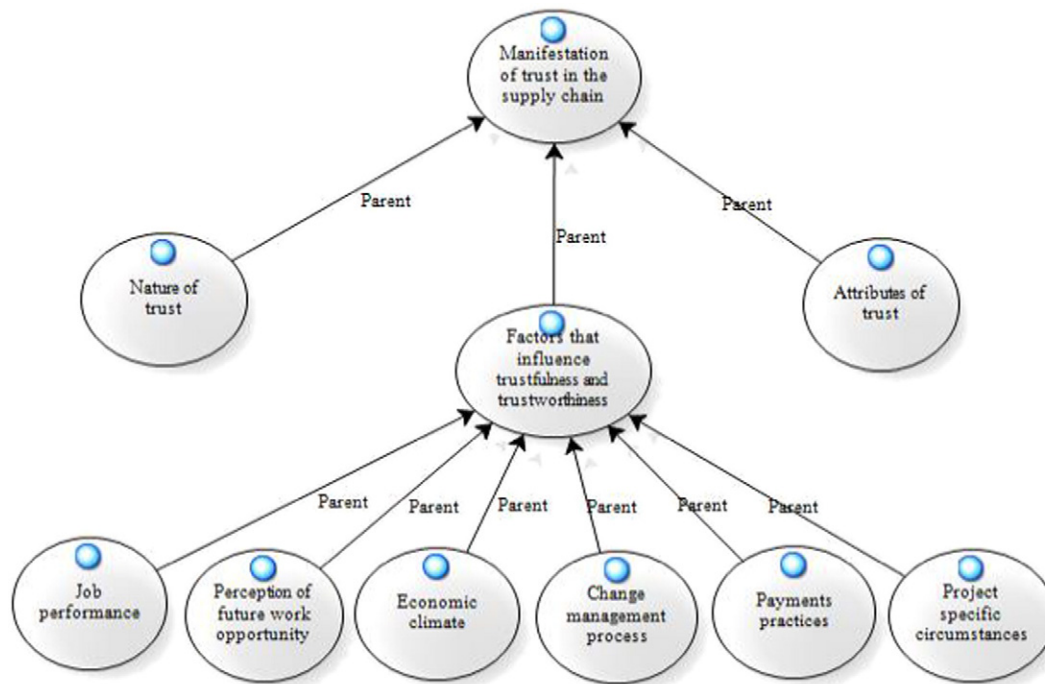


Fig. 1. Thematic analysis output on the theme 'manifestation of trust in the supply chain'.

factors that influence trustworthiness and trustfulness. From this thematic clustering process, six factors, which are the focus of this paper, emerged on the sub-theme 'factors that influence trustworthiness and trustfulness' as shown in Fig. 1.

To explore patterns between the six factors that emerged from the analysis, a matrix coding query was also run in NVivo between the sub-theme 'factors that influence trustworthiness and trustfulness' and a data attribute that related to categorisation of interviewees into 'main contractors' and 'subcontractors'. This query enabled for exploration of any discernible patterns in the views provided by main contractor and subcontractor personnel on factors that influenced their respective trustfulness and trustworthiness across the four projects.

5. Findings and discussions

The six key factors that emerged from the analysis as influential to trustfulness and trustworthiness of main contractors and subcontractors were: change management process, payment practices, economic climate, perception of future work opportunity, job performance and the project-specific circumstances. Table 3 provides a summary of views that were expressed by main contractor and subcontractor personnel across the four case study projects.

5.1. Change management process

The influence of changes to work scope was highlighted by both main contractors and subcontractors as a source of disagreement that easily escalates into disputes and loss of trust. The realities of the project environment, which sometimes made it

practically difficult to act in accordance with change management procedures as set out in the contracts documents, provided an avenue for trust to deteriorate according to some interviewees:

"...in a perfect world then, we'd have every variation measured and agreed beforehand...but because of the pressure of the programme, some people get things done and then come back to us with a cost and it's like what's fair and reasonable really. So it's negotiating the final account and going through the variations to see what is a viable variation and what isn't".

[(Contractor Alpha — quantity surveyor)]

The project team on Alpha and Gamma also associated negative stereotypes to particular work trades such as scaffolding and demolition works, which were revealed to be more prone to variations. They felt that these subcontractors were the most likely to display opportunistic tendencies — an expression of low trustfulness by the main contractor's project team. Alpha's project team paid careful attention to the change management process particularly because the project commenced when designs were incomplete. Kadefors (2004) recognised that changes that arise in the course of a project as a result of modifications to client's preferences, market demands, weather and soil conditions and errors and omissions, shape the terms of an exchange and increase vulnerability of the clients' relationship with main contractors. However, in the case of main contractors and subcontractors, it can be seen from Table 3 that both parties expressed some vulnerabilities in relation to project changes. The views expressed by each party in regard to change management were primarily concerned with the opposite party's trustworthiness, which in turn determined

Table 3
Factors that influence trustworthiness and trustfulness during projects.

Trust influencing factors	Main contractor's views	Subcontractor's views
Change management process	Not taking advantage of 'daywork-type' variations Not claims conscious that like to exercise opportunity on variations	Being fair and reasonable in valuing and negotiating any variations Little discrepancy in entry and exit price for work package Openness in dealing with variations Willingness to formally confirm verbal instruction Getting paid on time Good payment terms and conditions No unnecessary demand of discounts Not having to chase payments before they come through on time Not having to write-off retention money as part of final account negotiations Paying exactly what is due for work done Releasing retention sums when they are due without any delay Specifying fair and reasonable number of 'account receivable' days
Payment practices	–	Determines extent of emphasis on cheapest price Determines extent of emphasis on competition rather than negotiation Threat of subcontractor going into administration Dictates contingency sum allowed for in the budget
Economic climate		Determines the tightness of profit margins to be made on a work package Affects extra facility allocated in budget for contingencies
Perception of future work opportunity	–	A company that has the ability to win lots of large projects A company that recognises the commitments made to be part of their supply chain Commitment to reward subcontractors that perform well with repeat business opportunities Frequency with which future work has been consistently secured in the past Honest communication about the prospects of securing future work Realisation of increase in annual spend from the same company Extent to which good relationships already exist with the people that matter
Job performance	Ability to resolve problems Ability to self-manage work package Being honest when there is a problem by getting everybody informed immediately Coming back to fix it when it goes wrong Consistency of performance Cost competitiveness Finding new ways of doing things Health and safety performance High standard of workmanship How they affect team composition for the project Input into business initiative that is being promoted in organisation Ability to meet the programme Not overcommitted to excessive workload	Ability to correctly plan interfaces between work packages
Project specific circumstances	Client's demand for a certain percentage of subcontractors to be local Flexibility of budget for the project Subcontractor nomination by the client Procurement arrangements that are of a long-term nature Size and nature of the project Specific performance demands of a project	–

the trustful attitudes they displayed during the projects. Gamma's project team for instance, resorted to the use of accurate record keeping of demolition waste and excavation materials taken from the site. This was to avoid any disagreements on the demolition work package. Whilst this accounting exercise compensated for the low trustfulness of Gamma's project team, it was independent of the actual

trustworthiness displayed by the demolition subcontractor, at least in this instance. The demolition subcontractor's project coordinator described this process:

"...I had to issue all the waste transfer notes on a daily basis, all the materials that were shifted had to be presented to [Gamma] weekly and they would go through and say, but

you've missed one because they recorded every load that went off site as well and the two had to match up so it was quite a tedious accounting exercise”.

This proactive record keeping approach revealed the demolition subcontractor's trustworthiness whilst also demonstrating the project team's honesty (trustworthiness) given that attention was constantly drawn to underestimations in the subcontractor's own record during the exercise. According to the demolition subcontractor, this signalled that Gamma's project team was genuinely interested in compensating them for the exact amount of work done. Other subcontractors also devised a strategy for extracting cues about the main contractor's trustworthiness by reflecting on the extent to which there was consistently little discrepancy between entry and exit price for work packages. To them, this signalled the main contractor's commitment to ensure that the jobs are accurately priced as well as their intentions to pay fairly for work done. The reluctance to issue confirmation of verbal instructions was also considered to reflect a lack of integrity and low trustworthiness on the part of the main contractor's project team.

5.2. Payment practices

Payment practices was another factor associated with the integrity of main contractors, and hence their trustworthiness. This was mainly a trustworthiness issue linked to main contractors because of the power position they occupy in the construction supply chain. The nature of demand and supply within the construction industry positions subcontractors somewhat within the buyer dominant zone of Cox's power matrix (see Cox and Ireland, 2002), giving main contractors the power leverage to maximise their individual profit to the detriment of subcontractors. According to subcontractors, the main contractor's approach to payments was the most significant determinant of how trustworthy they are. This trend is unsurprising, particularly in the UK where trade credit constitutes 37% of total business assets (Department for Business Innovation & Skills, 2013a,b). Payment terms that exceed 100 days are not uncommon (Government Construction, 2012), with a high tendency for large construction companies to use their dominance and bargaining power to force smaller firms into accepting longer payment terms. Sensitivity of subcontractors to cash flow challenges as a result of these poor payment practices also tends to increase with decreasing enterprise size (Wagenvoort, 2003).

Subcontractors were also emphatic about delays in the release of retention sums at the end of defect liability periods as these deductions had become another channel for main contractors to hold back a percentage of their money as a form of discount. Subcontractor trustfulness however increased considerably whenever a main contractor demonstrated genuine concern towards their cash-flow difficulties, with a subcontractor on project Gamma indicating high trustfulness as a result of prompt payments and a decision to exempt them from retention deductions on the project. Subcontractors raised additional

concerns about the practice where main contractors are constantly demanding different discounts as well as the time they spend chasing payments to ensure that they come through on time. Productive time that could be spent by subcontractors on developing and growing their business was sometimes used to follow up on payments before their due dates just to ensure that they were paid on time. Hence, construction industry interventions on the issue of late payments should not only focus on mere achievement of prompt payments, but also ensure that subcontractors would not have to spend so much time off their core business activities to make this a reality.

5.3. Economic climate

The economic climate was described by main contractors and subcontractors as a factor that influenced the extent of emphasis placed on commercial issues during the projects. Due to the challenging economic conditions at the time of the research, the interviewees expressed the feeling that relationships had become more contractual than relational due to greater emphasis on money. This resulted in a higher tendency for project teams to select unknown subcontractors so as to meet stringent budgetary requirements as acknowledged across the four projects. An interviewee explained:

“...when it gets like this in a recession as they call it, money's tight, and it becomes extremely contractual and that goodwill that was prior to all this downturn, it disappears, it disappears. The QS's really, the commercial people, rule the roost, what they say happens. The site team might say ‘we wanna use him,’ but the commercial team says ‘he's not there on price,’ or ‘he's contractual,’ then it doesn't happen”.

[(Director of flooring subcontractor on Delta)]

The main contractor's project team also revealed that well-known subcontractors could provide uncompetitive price estimates, reflecting their low trustfulness during this period. Commercial teams thus resorted to rigorous market testing of prices obtained from their supply chain subcontractors just to ensure that these were reliable and competitive enough. Delta's project team indicated that the decline in economic climate provided an environment for services of technically competent subcontractors to be secured at more competitive rates. All these views reflect arguments by Smyth (2010), that an economic recession creates the environment where emphasis is placed on price rather than value. During such periods, short-term efficiency gains are given more priority than the pursuance of long-term improvements in product and service delivery effectiveness (Smyth, 2010, 2011). Likewise, Kumaraswamy et al. (2010) suggested that an economic recession re-introduces a cost focus even amongst earlier advocates of industry reforms towards a relational agenda, resulting in a contracting environment that is not conducive for trust building.

Another issue that was linked with the economic climate was the high tendency for subcontractors to go into administration in the course of a project. This is due to the high impact that market volatility has on the construction supply chain,

particularly the smaller sized and less established firms (Segerstedt and Olofsson, 2010). This also supports findings by Khalfan et al. (2007), that the financial position of an organisation plays a vital role to trust building, with those that are struggling financially tending to be the ones that under bid for work. Some project team members expressed the view that subcontractors could attempt to conceal traces of eminent bankruptcy when trying to secure a job, making this a trustworthiness issue. Rigorous financial checks were undertaken on the case study projects, sometimes using third-party agencies, before subcontractors were awarded a work package. The project team continued this financial monitoring process during the project so as to be able to respond proactively by activating recovery plans in the event of any bankruptcy. The macro-economic environment is thus a contextual factor that mainly influences the trustfulness of main contractors and subcontractors.

5.4. Perception of future work opportunity

Subcontractors' perception of future work opportunities had considerable influence on their trustfulness even when the main contractor displayed low levels of trustworthiness during the project. Subcontractors were more trustful of highly reputable main contractors that had the capacity to secure major construction projects. This was driven by future work winning opportunities from such main contractors. Subcontractors that perceived a higher opportunity to attract future work displayed positive psychological expectations that made them accept more vulnerabilities as compared to those that perceived their engagement as one-off, without any future prospects, or those that felt they would be betrayed on the next job. This reflects arguments by Evans and Krueger (2010), that trust is significantly influenced by reciprocity norms, whereby expectations of benefits can be projected into a future relationship. When parties make sacrifices on a project, they expect such favours to be returned, failure of which results in disappointments and relationship breakdown (Khalfan et al., 2007). The main contractor's personnel also acknowledged this reciprocal nature of trust and the influence of repeat business opportunities on subcontractor trustfulness.

Alpha and Delta used high level communication to manage situations where previously helpful subcontractors felt betrayed for not securing a work package, particularly when they had made significant contributions during the tendering process. In the case of Beta, consistent disappointments that had been poorly managed, resulted in a strained relationship with a supply chain subcontractor. Although the supply chain relationship was now under repair, and this subcontractor had been offered work on the present project, their attitude reflected that of low expectation and fear of inconsistent work flow in the future, for which they were not prepared to accept excessively vulnerable positions as they did in the past (low trustfulness). Trustfulness here was thus about a calculative estimation of the perceived future value and benefit that could be derived rather than the main contractor's innate trustworthiness. Effective communication at high level could thus be used to explain situations honestly and manage any

feelings of imminent betrayal within the supply chain. This also provides further evidence that open and honest communication is an effective strategy for trust building in construction as previously claimed by Khalfan et al. (2007).

5.5. Job performance

Job performance was expressed by both main contractors and subcontractors as a trust influencing factor. This was not only in relation to technical performance, but also commercial competitiveness. It was observed during pre-start meetings on project Alpha as well as the subcontractor evaluation meeting on project Delta that the project teams were very concerned about H&S performance, workmanship standard, supervision, labour and other resources allocated to the works. The construction manager on Alpha paid particular attention to H&S performance as this was considered as a good proxy for evaluating subcontractors' potential to perform satisfactorily on the project. A lapse in performance by a subcontractor on Delta was realised following a recent change in their management. The project team decided to subsequently increase monitoring on this subcontractor as well as request that they provide more labour on site to meet performance targets — reflecting a decrease in the project team's trustfulness. Job performance, however related more to the subcontractor's trustworthiness than to the project team's trustworthiness although a few subcontractors expected the project team to get the planning and interfacing of the works right before they were invited to commence their works on site.

Subcontractors were also of the view that progressive job performance on each project was the best strategy to assert their competence as this was the most significant criteria based on which their trustworthiness was evaluated by the main contractor's project team. This view is reflected in a claim by one of the subcontractors:

“...effectively you're only as good as your last job as far as I see it so we look to perform on every single job and on that basis, their company have then got surety that our company does what it says”.

[(Contracts manager, roofing subcontractor on Alpha)]

The task specific nature of technical competence also became evident when a highly trusted structural concrete subcontractor on Gamma was given extra supervision on a drainage and groundworks package they had been awarded for the first time, having recently expanded their business into the delivery of this work package. This differential trustfulness that was directed at the same subcontractor reveals why Mayer et al. (2007) asserted that trust in competence cannot be generalised across dissimilar tasks for which parties are not known to have demonstrated proven performance (trustworthiness). Furthermore, the main contractor's project team realised that subcontractors could perform poorly if they become overcommitted with excessive workloads on other projects.

To ensure that the project team had no doubts about their performance (trustworthiness), some subcontractors also adopted a

rather proactive approach of sending regular informal and unsolicited updates. This strategy was adopted to increase awareness of successful progress whilst minimising any performance related uncertainties as described by this subcontractor:

“I think [how trust emerges] it’s the team and talking to the team and keeping them informed I think is crucial. If we keep them informed, we’re doing this today, we’re doing that tomorrow, we’re doing that next week, then they can plan and they can see and if those things happen in the right sequences and in the right timing, then they start to build up their trust and their confidence that you know what you’re doing”.

[(Project coordinator, demolition subcontractor on Gamma)]

This constant creation of awareness demonstrated the subcontractor’s trustworthiness whilst increasing the project team’s trustfulness. Indeed, the project team considered it particularly important that subcontractors are honest and open in communicating to all concerned whenever there was an imminent problem related to their work package. This again demonstrates the importance of honest and open communication to trust building on projects (Khalfan et al., 2007). Laan et al. (2011) also found that virtuous cycles of trust develop because problems are openly discussed to arrive at innovative solutions whilst Wong et al. (2000) revealed that the achievement of results is very relevant to building and maintenance of trust in project environments. Beyond conventional job performance considerations such as cost, workmanship standard, ability to meet programme and H&S, other performance considerations that apply specifically to main contractor and subcontractor relationships are the subcontractor’s ability to self-manage their work package, willingness to return and fix defective work and even how a particular subcontractor would affect team composition for a project. As can be seen from Table 3, these were all important job performance considerations that related to the subcontractor’s trustworthiness.

5.6. Project-specific context

Some project specific factors influenced trustfulness of the main contractor’s project team. On case Alpha and Gamma, one of the project performance criteria that had been set by the public sector clients was that some local subcontractors are employed on the project. This meant that in some instances, the project team became less trustful of unfamiliar subcontractors that had to be selected to meet this performance requirement. This low trustfulness was however not necessarily dependent on the actual trustworthiness of such subcontractors but rather on the fear that they had not been tried and tested. Gamma’s project manager remarked:

“We haven’t got a target but we’re trying to get as many local companies as we can and we’ve done quite well so far...but I suppose if it’s a low risk package, you’re not as worried about it but you still want to monitor it because even low risk stuff can be messed up”

The cautiousness expressed by the project manager reflects low trustfulness towards unfamiliar subcontractors. In some

instances, unknown subcontractors were also nominated by the clients, which influenced trust and relationship dynamics on the project. On other projects, like that of Delta, there was that flexibility to carry the same subcontractors across projects that constituted the PFI package, particularly considering their role as part of the special purpose vehicle responsible for delivery of the projects. The project team on Delta was thus more trustful of such subcontractors given the extent of inter-organisational learning and joint ethos that had emerged through continuous working (Kale and Ardit, 2001). This also supports claims that procurement arrangements that are of a long-term nature provide a more conducive environment for trust building (Laan et al., 2011; McDermott et al., 2004). Again it explains why procurement procedures that focus on price through output control and authority through process control can sometimes be detrimental to trust development (Eriksson and Laan, 2007).

Another project specific factor that influenced trustfulness and trustworthiness was budget flexibility. The main contractor’s project team was of the view that negotiated projects were more flexible on budget than projects won through competitive tendering, and allowed for some focus on value additions through prioritisation of supply chain subcontractors. Alpha’s project team for instance acknowledged that winning their job on a tighter margin made them extremely particular about meeting stringent budget requirements. This restricted the extent to which they could prioritise the use of subcontractors that were already highly trusted by the site management team. Khalfan et al. (2007) previously identified project size, complexity and the contracts used, as project related factors that influence trust building. It was revealed that trust levels were higher on smaller projects than on larger projects whilst complex projects promoted higher levels of trust due to information sharing and communication across multiple boundaries. Contract was also revealed to have an influence on the ability of parties to form trusting relationships (Khalfan et al., 2007). Interestingly, none of the interviewees mentioned the contract form as a project related factor that influences their trustfulness or trustworthiness. This perhaps reflects the informal and fiduciary nature of relationships that tends to exist between main contractors and subcontractors.

The present findings thus reveal that the procurement strategy for a project, as well as the client’s leadership, in terms of the key performance criteria that they set for the project, can influence trustfulness of the project team. Wong et al. (2005) came to the conclusion that it was contractors, rather than clients, that were responsible for initiating trust by demonstrating competent performance and maintaining effective communication with clients. However, findings here reveal that the client’s leadership, particularly the key performance targets that they set for the project and the procurement strategy they adopt, can be important for initiating virtuous cycles of trust in the construction supply chain.

6. Discussions and implications of findings

Trustfulness and trustworthiness are two different aspects of trust that need to be understood when seeking to promote trust

in dyadic business relationships. Whilst trustfulness can be derived from the extent of trustworthiness that is inferred from the party being trusted, it can also derive from the perceived value or benefit that can be obtained by displaying a trustful attitude (Gambetta, 2000; Hieronymi, 2008). This was evident in the case of subcontractors, where expectations of future work from main contractors made them trustful to the extent that they accepted vulnerabilities even when they acknowledged the main contractor was not entirely trustworthy in regard to their integrity and ethical conduct. The main contractor's trustfulness was also influenced by economic climate and the project specific context, particularly the extent to which this restricted their choice of subcontractors for the project. Hieronymi (2008) however argued that experiences of betrayal that occur when trustfulness is based on an anticipated benefit or context are less severe than those based on trustworthiness, hence resulting in weak and fragile trust. This suggests that to promote strong and sustainable trust in main contractor and subcontractor relationships, efforts should also be channelled into promoting ethical and trustworthy behaviour in the supply chain rather than on creating the context for parties to be trustful — through the value or benefits that they stand to derive from such trustful attitudes.

Thus whilst the use of institutional mechanisms such as strategic partnering, framework arrangements and supply chain agreements can guarantee some continuous benefits for the supply chain, this would mainly contribute to benefit-induced trustfulness that is still fragile and can easily be lost if parties continue to display untrustworthy behaviour. Such efforts would only contribute to a social construction of personal attitudes and optimistic trustfulness that may not necessarily be commensurate with the trustworthiness of the contracting parties. Given this less critical nature of benefit-induced trustfulness, it is advisable that vulnerabilities are accepted based on realistic evaluations of trustworthiness (see Manu et al., 2013a), which again reveals why the use of formal control and monitoring mechanisms become useful in compensating for any deficiencies in trustfulness during the course of a project. Contrary to some arguments that formal control and monitoring mechanisms can have detrimental effects on trust development (Kadefors, 2004), such actions could actually provide the bases for developing strong trust that is founded on demonstrated trustworthiness. This was seen on project Gamma, where initial scepticism towards the demolition subcontractor (low trustfulness) resulted in the use of a formal monitoring mechanism that ultimately provided the platform for both parties to demonstrate their trustworthiness.

Since the main concern about improving trust in main contractor–subcontractor relationships is about trustworthiness of the two parties, there is the need to understand how deficits in trustworthiness can be overcome. The factors that were influential to the display of trustworthiness were the change management process, payment practices and job performance. Positioning these trustworthiness influencing factors within the context of Meyer's classification of trustworthiness into ability (competence), benevolence and integrity (Mayer et al., 1995), it is evident that the benevolence dimension of trustworthiness

would in actual sense be more related to the promotion of trustfulness rather than trustworthiness. This is because there is no legal or moral requirement for main contractors or subcontractors to demonstrate benevolent behaviour during a project although such actions can be initiated by considerations of anticipated benefits that could be derived from the supply chain relationship. The competence aspect of trustworthiness is a requirement that subcontractors have to demonstrate, hence the need for them to progressively embrace innovative approaches to delivery of their work packages, whilst communicating their competence effectively to main contractors.

The integrity component of trustworthiness was however a characteristic that had to be demonstrated by main contractors and subcontractors alike, as revealed from the influence of the change management process on trustfulness and trustworthiness. This due to the potential for both parties to be dishonest with their valuations of extra work. Both parties have a responsibility to demonstrate their trustworthiness when managing changes to work scope although main contractors have a greater responsibility of ensuring that there is consistently little discrepancy between pre-negotiated prices and the final subcontract account. Whilst practically difficult to achieve in some instances, progress can be made through (1) accurate estimation of subcontract work packages, (2) subcontract award based on accurate estimates of the work rather than on cheapest price and (3) fair and accurate valuations of unavoidable changes to work scope. Discrepancies in entry and exit prices for work packages can also be minimised by adopting building information modelling (BIM), which can be used to simulate the construction process at an early stage, detect and rectify clashes and ensure that change orders are minimised during actual construction (Barlish and Sullivan, 2012). This potential reduction in change orders issued on a project could therefore be an indirect route through which BIM adoption improves trust in the construction supply chain.

The integrity component of trustworthiness that relates to payment practices however requires significant improvements on the part of main contractors given the late payment culture that prevails in the construction sector. Main contractors would have to manifest behavioural traits such as reliability, promise fulfilment and fairness (Mayer et al., 1995) in regard to payments. Demonstration of trustworthiness in regard to payment practices however requires positive organisational cultures that reflect high levels of business ethics and communities of practice. Currently, the culture of late payments has primarily been confronted using legislative measures. The European Directive 2011/7/EU on combating late payments in commercial transactions specifies that debtors would have to pay and reimburse reasonable recovery costs if goods and services are not paid for within 60 days for private businesses and 30 days for public agencies. In response to this directive, construction sector specific legislations such as the Housing Grants, Construction and Regeneration Act 1996 and the Local Democracy, Economic Development and Construction Act 2009 have all been implemented in the UK construction sector.

These legislative measures mainly ban the use of conditional payment terms where main contractors introduce pay-when-paid

clauses into contracts which stipulate that they are only obliged to pay subcontractors when paid under a separate contract with the client (Cheng et al., 2010). However, the main drawback of these legislative measures is that legal rights are often not exercised because subcontractors are concerned about jeopardising their commercial relationships and future business opportunities. Beyond such legislative efforts, there is the need to adopt other institutional/administrative as well as voluntary measures in tackling late payments. Sector-specific voluntary prompt payment codes and charters, such as that launched in the UK by the Construction Leadership Council is only a starting point. This charter sets out a commitment to reduce payment terms to 45 days in June 2015 and to 30 days by January 2018.

Major construction clients, particularly public sector clients, can also make prompt payments a project success criteria that attracts a significant scoring during the procurement process for any new project. This process can also be implemented in conjunction with a 'name and shame' strategy, where main contractors that default on payments to their subcontractors are listed on an approved database of late payers. Payment defaults would then translate directly into poor project performance ratings, reputational damage as well as potential loss of future work opportunities. This could prove too costly for main contractors that engage in the practice. Payment tracking systems can also be deployed on projects to track the timelines of payments to the supply chain, or the quantum of outstanding payments for which there are ongoing disagreements at any given time during the project. Such a payment tracking system would help to promote transparency, and contribute significantly to improving trust in the supply chain.

The use of project bank accounts can also be promoted across the construction sector to facilitate direct payment of the supply chain by the client organisation. Project bank accounts, which have a trust status can be set-up specifically for the client to make direct payments to members of the supply chain named as trustees to the account (Government Construction, 2012). Whilst the use of project bank accounts was launched by the UK Cabinet Office in 2012, it has only been employed on a limited number of public sector construction projects to assure the supply chain of certainty, security and promptness of payments. However, further use of project bank accounts across public and even private sector projects, could help to overcome the culture of late payments and improve transparency between main contractors and subcontractors.

In regard to retention, a Government backed retention protection scheme can be launched so that main contractors are contractually obligated to deposit retention deductions with approved third-party organisations for release at the stipulated retention release periods. This scheme could also be operated as an escrow account that is held by an independent third-party (Cheng et al., 2010). Retention sums deducted by the main contractor on a given project are then deposited into this escrow account and subsequently released to subcontractors when specified conditions have been met. This practice can significantly improve trust between main contractors and subcontractors as there would be no opportunity for main contractors to abuse deducted retention sums as another form of subcontractor's

discount or even earn any interest payments as could otherwise be the case when these sums are held in their company bank accounts. Furthermore, retention deductions can be replaced with retention bonds, which subcontractors and suppliers can provide as security against any defective work. This alternative approach can eradicate the abuse of retentions whilst improving trust and confidence of the supply chain.

7. Conclusions, limitations and future research

The study offers some empirical insights into trust development in main contractor and subcontractor relationships, with particular emphasis on factors that influence trustfulness and trustworthiness of the two parties during projects. Most importantly, the findings indicate that stronger and sustainable trust does not just derive from either party's demonstration of trustfulness, but rather on their respective trustworthiness. This is because trustfulness can also be based on the anticipated benefits or value of demonstrating a trustful attitude even when the trusted party lacks integrity and is untrustworthy. Project based relationships that thrive on such benefit-induced trustfulness tend to be fragile and unstable, hence more importance should be placed on promoting trustworthiness and high ethical standards in the construction supply chain rather than striving for project participants to be more trustful. At best, trustful attitudes that are displayed by main contractors and subcontractors should only be commensurate with the trustworthiness demonstrated by either party. At present, subcontractors tend to base aspects of their trustfulness on supply chain benefits that they stand to derive from main contractors, making trust in the supply chain weak and unstable.

It has also been revealed that formal control procedures can be complimentary to the trust development process given the effect it has on trustworthiness and trustfulness of main contractors and subcontractors during projects. Formal control and monitoring procedures can provide the platform for parties to demonstrate their trustworthiness whilst strengthening the trusting party's trustfulness. This process is crucial towards the formation of trustworthiness-induced trustfulness. These findings emphasise the criticality of both trustworthiness and trustfulness as two separate constructs that need to be understood to facilitate trust development on projects. The findings also demonstrate how contextual factors as well as innate issues that relate directly to the different parties, influence trust development on projects — justifying the need for an integrated consideration of micro-level psychological and macro-level institutional approaches when seeking to build or repair trust.

There are however some limitations to the study's findings. Firstly, results from the exploratory case studies cannot be generalised. The six factors synthesised from these four case studies are probably not generalisable and exhaustive and further studies would be required to explore from other cases, any other factors that influence trustfulness and trustworthiness of main contractors and subcontractors on projects. Another important line of inquiry would be to conduct a wider survey on the factors that influence main contractor and subcontractor trustworthiness and trustfulness before they can be statistically generalisable.

Another limitation of the study is that it concentrated on only first-tier subcontractors although the construction industry is renowned for its dependence on multi-layered subcontracting. Given the tendency for a culture of distrust to be more pronounced further down the subcontracting layers, it would be interesting to explore how any of the six factors identified in this study influences trustworthiness and trustfulness in dyadic relationships further downstream of the subcontracting layers. Lastly, there is also scope to investigate the extent to which BIM adoption can impact on trust development during projects, given its potential to minimise change orders that are issued during actual construction.

Conflict of interest

None.

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