


## Article

# Towards The Development of a Governance System for Central Purchasing Body Collaboration and Performance

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**Abstract:** This article explores the relationship between local authorities (mainly municipal organisations) and a central purchasing body (CPB). It critiques, from an agency theory perspective, the difficulties in aligning socio-economic goals of multiple municipal organisations with the pursuit of procurement goals by the CPB. The aim of this study is to explore which solutions, (governance mechanisms) for agency problems within a Dutch municipality–CPB relationship, are critical in aligning socio-economic goals within a collaborative public procurement (CPP) setting. The quantitative analysis of data from a questionnaire was used to conduct an explorative factor analysis (EFA). The questionnaire was issued to all municipalities in the Netherlands. Grounded on the EFA, the underlying factors within five categories of governance mechanisms for agency problems were recognised. Besides supporting the existing theory, this study provides additional knowledge in the field of agency theory and collaborative public procurement (CPP). The study resulted in the development of a comprehensive measurement scale to conduct research based on agency theory within the context of CPP governance and specifically in the area of central purchasing bodies. The results of this study are applicable in practise on an administrative and management level. Municipal organisations that initiate and/or govern a central purchasing body can take the results of this study into account to develop new standards on the further development of the CPB. At a managerial level, this study provides useful insight for decision-makers in municipal organisations to improve the way in which a CPB executes collective tenders at hand and determine if the joint approach delivers the best results in terms of their procurement objectives.

**Keywords:** agency theory; collaboration; governance; procurement



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## 1. Introduction

Local authorities have sought to cope with the increasingly complex public procurement context by working together [1,2]. Collaborative procurement between local authorities has proven to be a solution for the difficulties they experience. In the public sector, a general trend towards the development and establishment of central purchasing bodies in an attempt to provide joint purchasing provision has been observed. The expected benefits of collaboration, such as joint purchasing, etc., include the fact that local authorities can benefit from the economies of scale, such as cost reduction, etc., [3]. Furthermore, collaborative procurement reduces transaction costs because the number of transactions is reduced, and this collaboration provides local authorities with greater access to procurement expertise, which they could not reach themselves, thus fulfilling a condition for increased effectiveness [4]. The advantages of collaboration seem to outweigh the disadvantages, for example, a reduced efficiency and higher agency costs [2]; when compared to higher agency costs, structural cost savings often outweigh the need to increase coordination amongst members [5]. Giving up a portion of autonomy through the establishment of a CPB seems like a small price to pay for the availability of the expertise, which is currently needed to

bring the complex public procurement process to a successful outcome [6]. Furthermore, concerning the success stories of procurement collaboration, academics have also critiqued the current trend. For example, [7,8] raise the issues around whether collaborative public procurement serve certain procurement objectives but not others?

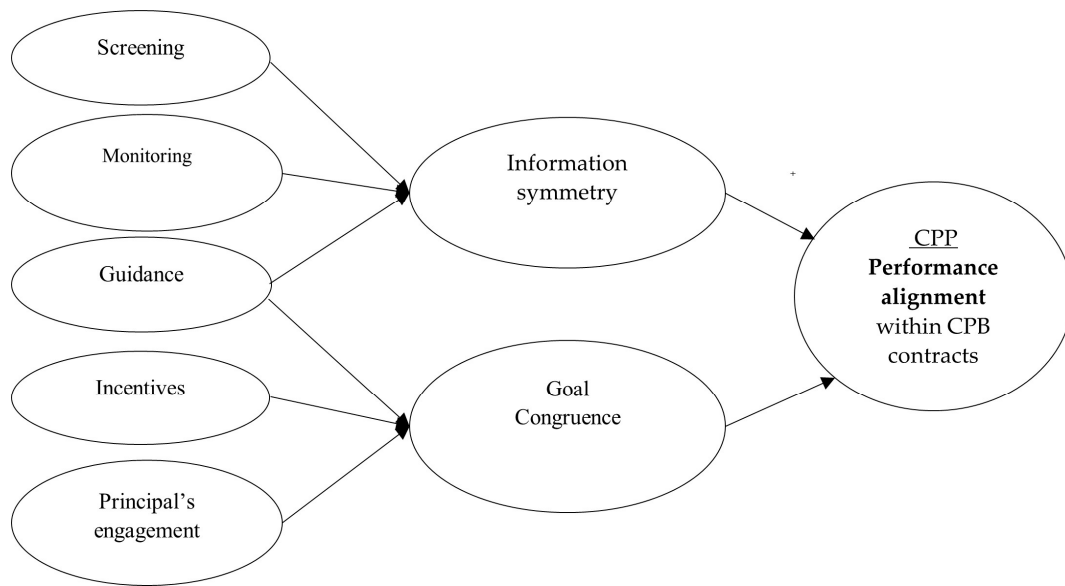
Therefore, the aim of this paper is to explore what key factors exist that enable the alignment of the CPBs socio-economic goals within this collaborative public procurement (CPP) setting, and to understand the main issues and relationships that exist within a currently established CBP arrangement. The case study involves a Dutch municipality–CPB arrangement. The work starts by covering some of the key literature around current CBP and CPP relationships, identifying the key issues and underlying factors that are central to the correct functioning of such a relationship. From here, the authors employ a quantitative approach towards identifying and ranking through statistical significance, the key factors relevant to the example municipality-CBP relationship. The results of this work conclude by highlighting the underlying factors and government mechanisms relevant to the case study employed, but also which are common for other similar CPP settings, thus providing important new knowledge in the area of collaborative public procurement systems.

## 2. Literature Review

Agency theory is applied to relationships between the one party who delegates tasks (the principal) to another party (the agent) who then performs those tasks [9]. Within the principal–agent relationship, agency theory seeks to find the optimum contract arrangements between parties, and helps to explain the observable actions of the principal and agent [10]. The two main assumptions of agency theory are the existence of goal conflict and information asymmetry between the principal and agent [9]. Within this research, local authorities (principals) strive to reach their procurement goals via a collaborative approach delegated to the CPB (agent). By applying a principal–agency perspective, deeper insight into the underlying causes of the effects of collaborative public procurement by CPBs on non-financial procurement performance indicators can be gained [11].

One of the causes of agency problems is goal conflict between the agent and principal. According to agency theory, the chance that a CPB will pursue its own goals does increase if the agent is not monitored [12]. However, high monitoring costs are seen as one of the barriers to overcoming the agency problem of goal conflict [13]. Besides goal conflict between the principal and agent, information asymmetry is one of the main pillars under agency [11,13]. Within the context of collaborative public procurement (CPP), the size of the collaboration, the number of members, and the geographical scope make it more difficult to reduce information asymmetry within CPP arrangements [14–16]. Agency theory is based upon the assumption that people’s actions are rational and motivated by self-interest [8,10]. This assumption lays at the base of the agency problems (goals conflict and information asymmetry) as described above. Self-interested, opportunistic behaviour becomes an agency problem when the interests of the principal and agent are not aligned [13]. Where municipalities delegate the procurement task for certain commodities to a CPB, the CPB might have other interests than the principals’ [17].

The theory suggests that the performance of socio-economic goals is negatively influenced due to goal conflict and information asymmetry between the principals (local authorities) and agent (CPB). According to the literature, the solutions to agency problems result in a higher level of goal congruence and a better information position for principals. Derived from the literature review and existing theory, the framework for this research, is utilised to structure the paradigm of this study. The main proposition is that, according to what the literature predicts, the solutions for agency problems contribute positively to information symmetry and goal congruence. The agency theory assumptions of goal conflict and information asymmetry [11] are considered in their positive forms, which are, respectively, goal congruence and information symmetry [18]. Table 1 outlines the key issues raised and, hence, the variables in this literature review, which enables the authors to develop their research framework shown in Figure 1.



**Figure 1.** Research framework.

**Table 1.** Literature review and variable identification.

Author	First Order Variables	Second Order Variables
[9,11]	Agency Theory	
[11–14]	Goal Conflict	
[13,14]	Monitoring	
[10,13,14]		Information Symmetry
[14]	Collaboration	
[18,19]		Goal Congruence
[20,21]	Screening	
[18,20–23]	Guidance	
[11,13–15,24,25]	Principal's Engagement	
[9,25]	Incentives	

Therefore, the aim of this quantitative research study is to explore what opportunities (governance mechanisms) for agency problems within a Dutch municipality–CPB relationship are significant in aligning socio-economic goals within a collaborative public procurement (CPP) setting. Hereby, the theoretical fundament under CPP, which mostly emphasises value delivery through the economics of scale, is expended by empirical evidence to better understand how CPP can better align performance on socio-economic goals. Constructed on the results of this study, agency theory is enriched with empirically tested constructs in order to measure the conditions that determine the level of goal congruence and information symmetry within a collaborative public procurement setting in the Netherlands. The research framework is applied to a specific form of CPP, the municipal central purchasing body (CPB) in the Netherlands. As a result, it should be possible to infer what governance mechanisms are valuable to invest in aligning CPB performance with socio-economic objectives within this specific context. In line with the research framework, and given the specific context of this study, the following research questions are proposed:

1. What underlying factors of governance mechanisms that affect information symmetry are significant within the principals–agent relationship of a municipal CPB in the Netherlands?
2. What underlying factors of governance mechanisms that affect goal congruence are significant within the principals–agent relationship of a municipal CPB in the Netherlands?
3. What are the defining features of the underlying factors of governance mechanisms within the specific context of a municipal CPB in the Netherlands?

### 3. Research Method

Table 1 identified the key variables from the analysis of the literature surrounding collaborative public procurement. From the analysis of the extant literature, the following research framework is devised in order to test the hypotheses around CPP performance. As can be seen from the framework, five fundamental first order input variables are identified from the literature. These first order variables feed into the two second order variables. Screening, monitoring, and guidance are considered the variables that impact information symmetry. Likewise, the first order variables of guidance, incentives, and engagement are considered to mostly impact goal congruence. Both the second order variables then directly feed into CPP performance.

This study provides findings that are deductively analysed to provide answers to the research questions. The ground of post-positivism is to interpret these findings, taking into account the circumstances wherein the primary data, in an objectively reality, has been collected [26]. Following this ground, the final stage of the analytical method used was to interpretate the initial findings based on the underlying theory in an intuitive iterative way [27,28].

For the unit of analysis in this research, the relationship between multiple principals and a single agent (the municipal CPB) has been adopted. The target population consisted of the 352 municipalities in the Netherlands. To ensure that the essential data were collected, the research framework (see Figure 1) was operationalised.

Two dimensions were applied as follows:

1. Variables that address information symmetry.
2. Variables that address goal congruence.

The operationalisation of the research framework based on the existing literature resulted in thirty-nine variables within the five governance mechanism categories.

### 4. Results

The descriptive statistics are presented in Table 2. The results show approximately a one-third, two-thirds distribution of job title ICT management versus procurement. The difference could be explained by the business network of the researcher, which spreads among procurement professionals more than among ICT managers. Within this study, both ICT managers and procurement professionals represent the municipal organisation (principal).

**Table 2.** Descriptive statistics.

	Job Title		Inhabitants		
	Count	%	Count	%	
ICT Management	33	28.9	0–20,000	6	5.3
Procurement	78	68.4	20,001–50,000	44	38.6
Otherwise *	3	2.6	50,001–100,000	33	28.9
			100,001–200,000	15	13.2
			200,001 or more	16	14.0
	Part of SSC		CPB Experience		
	Count	%	Count	%	
Yes	62	54.4	Yes, direct	29	25.4
No	40	35.1	Yes, indirect	59	51.8
I don't know	7	6.1	No	25	21.9
Missing value	5	4.4	Missing value	1	0.9

\* no alternative job title was entered.

Following this, the number of inhabitants served by the municipal organisations shows an unequal distribution in comparison to the distribution of the municipal size in the Netherlands. For example, 2.25% of the municipalities in the Netherlands have 200,001 or more inhabitants, while, in this sample, 14% of the responses come from organisations that serve 200,001 or more inhabitants. This can be explained via the high number of responses (54.4%) from organisations that are part of a Shared Service Centre (SSC). The number of participants served by an SSC is the sum of the inhabitants of the individual members of the SSC. Finally, 78.1% of the respondents have direct or indirect experience with tenders conducted by a CPB. This strengthens the data for further analysis, while a large proportion of the answers will be based on this experience.

#### Test Statistics

Before the results can be generalised to the whole target population, the internal consistency of the data has been checked concerning the non-response bias. The early and late responses were compared with an independent *t*-test [28]. None of the 39 items were statically different (on a 95% confidence level), while all *p*-values were higher than 0.05. Based on the independent samples *t*-test (see Appendix D), there is no need to take non-response bias into account while generalising the results to the target population.

If variables have a high positive or negative correlation (values > 0.7) with other variables, problems could arise in further statistical analysis [28]. To examine the correlations between non-parametric ordinal variables, Spearman's rho analysis can be used [28]. The analysis shows four variables with a high positive correlation coefficient. The correlations between SCR008 and SCR007 have a coefficient of 0.717. The correlations between INC007 and INC004 have a coefficient of 0.713. Both are significant at the level of 0.01. The correlations amongst variables will be taken into account when determining the rotation strategy within the EFA. The results have no negative implications for this study, while no further inferential statistics are conducted after the EFA.

To test the construct reliability, the internal consistency of the measurement scale has been assessed. The most widely used test for checking the internal consistency of multiple-item scales is Cronbach's alpha coefficient. An alpha of  $\geq 0.8$  is considered to show excellent internal consistency [28]. The Cronbach's alphas of all 39 items were above 0.8. The alpha of the total scale is 0.893, as presented in Table 3 below (also see Appendix E).

**Table 3.** Cronbach's alpha total scale.

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	No of Items
0.893	0.898	39

An exploratory factor analysis (EFA) has been conducted to test if the theoretical proposed constructs of information symmetry and goal congruence also exist within the municipal CPB/principal-agent relationship in the Netherlands. The EFA was conducted in three stages. In the first stage, the factor analysis was conducted using IBM® SPSS® version 27. Within this stage, the following issues of EFA were dealt with: (1) reliability and sample size, (2) factor extraction technique, (3) factor rotation strategy, and (4) factor retainment criteria [29]. In the second stage, the results were presented in the form of a rotated pattern matrix (see Appendix A), derived from the first stage. Finally, the interpretation of the results, which contains the labelling of the latent constructs (factors) derived from the EFA, was presented.

Within the EFA process, the results were first checked with the KMO (Kaiser–Keyser–Olkin) test and Bartlett's test of sphericity. The KMO test provides an indication of a sufficient sample size for reliable results, in which case the value should be above 0.6 [28].

Table 4 shows the results of the KMO and Bartlett's tests. The KMO value of 0.752 is above the 0.6 thresholds. The Bartlett's test is significant at the level of 1%. Based on these

tests, the assumption of sphericity is met and the KMO indicates a sufficient sample size to provide reliable results. The next step in the EFA is to decide which factor extraction technique is applied. The SPSS<sup>®</sup> default extraction technique is principal component analysis (PCA). Although PCA is the common extraction technique for many researchers, it is designed for data reduction purposes [29]. In this study, an extraction method that has a higher exploratory ability is needed to generate useful results. Furthermore, [30] states that, out of several other extraction techniques, maximum likelihood (ML) or principal axis factors (PAF) will generate the best results in exploratory factor analysis. While the ML method assumes that the data are normally distributed [29], this method does not fit categorical ordinal variables very well. In this study, PAF is applied as a factor extraction technique. The dataset in this study consists of correlated variables, as shown above where the results of Spearman's rho statistics are presented. Inter factor correlation is also expected because the research framework (see Appendices B and C for initial factor extraction data and analysis) does not withhold any a priori empirically tested measurement scale for the governance mechanisms of agency. Therefore, a direct oblique rotation strategy has been applied.

**Table 4.** KMO and Barlett's tests.

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0.752
Approx. Chi-Square		2270.957
Bartlett's Test of Sphericity	Df	741
	Sig.	0.000

The final step in factor analyses before interpreting the results is to determine what criteria to use in order to retain or delete factors. The most common criterium for the number of factors to retain is to look at the eigenvalues. While with each factor extracted, the eigenvalues become smaller and thereby account for smaller proportions of variance [31], proposed factors with eigenvalues smaller than 1.0 would be unstable and should be deleted. Appendix F shows the initial extraction of 11 factors with eigenvalues > 1.0, explaining 60.379% of the variance. Besides the emphasis on eigenvalues, the extensive literature on EFA proposes the application of additional factor retainment criteria. Another procedure to decide how many factors to retain is through applying the approximate simple structure method, where all items that cross loads on more than one factor with a value > 0.32 is deleted [32]. In addition, [31] advises scholars to conduct the methods described above and successively delete items and rerun the EFA without the items that should be deleted. The approximate simple structure combined with the rerun method [31] was applied to the data, resulting in 12 items being deleted. The results of the EFA final run are presented in the rotated pattern matrix, showing nine factors to retain. According to the table in Appendix A, those nine factors explain 62.221% of the variance among the twenty-seven items retained. The result of the interpretation stage in this study is presented in Table 5. All nine factors are assigned an intuitive description (label) and reattached to the category of solutions for agency problems.

**Table 5.** Factor labels.

Factor	Label	Solution Category
1	Representation	Guidance
2	Outcome-based (financial) incentive	Incentives
3	Track record of CPB	Screening
4	Direct monitoring/control	Monitoring
5	Goal certainty	Principal's engagement



Table 5. Cont.

Factor	Label	Solution Category
6	Divide into clusters	Principal's engagement
7	Direct involvement	Guidance
8	Behaviour based (resources) incentive	Incentives
9	Composition of the collaboration	Screening

## 5. Discussion

The discussion is structured according to the governance mechanisms for agency problems as presented in the research framework (see Figure 1). By subsequently addressing the government mechanism categories and their defining features, the third research question has been answered. Subsequently, the first two research questions are also answered through this approach. The factor analysis provided two underlying factors that represent the government mechanisms of the preliminary screening of the procurement collaboration (in this case, the CPB). Firstly, the track record of the CPB is found to be a decisive factor for municipal organisations to look at before committing to a joint tender. Secondly, the composition of the collaboration is a decisive factor for municipal organisations in deciding whether to commit to a (new) joint tender executed by a CPB. Screening the track record of the CPB as a decisive factor supports the agency theory assumption of adverse selection [9]. Furthermore, it supports the premise of preliminary screening as a possible effective solution for the agency problem of information asymmetry [11,33]. Ref. [34] states that large collaborative procurement organisations (such as CPBs) should have very competent resources to overcome information asymmetry between CPB and their members. In line with earlier research, the findings in this study show the extent of the importance on screening these resources, based on the available knowledge and the prior performance of the CPB. In contrast with previous research [20,21], screening the agent on how their activities are funded to reach socio-economic goals is not a decisive element in agent selection for the population in this study. This could be caused by the availability of the information and/or the costs associated with the screening efforts to obtain the information [21–23]. Another explanation as to why this item is not found to be decisive might be the character of the relationship between the municipal organisations (principals) and the CPB (agent). Both parties are part of the government structure, which initially leads to high levels of trust and less emphasis on screening funding constructs [2].

Municipal organisations want to know what other organisations participate in, the collaboration, and how strong their influence is. This underpins the findings of [35], who found member commitment to be one of the main drivers for collaborative public procurement. The tension between autonomy and the collective is found to be a strong barrier for collaborative procurement [36]; this could further explain why municipal organisations emphasise the composition of the collaboration and assessment of their level of influences as a decisive screening factor. Furthermore, assessing the composition of the collaboration underpins the findings of [37], who found that the formation of a community among members strengthens the commitment to the collaboration. Municipal organisations find it important that other municipalities with which they can identify themselves also participate in the collaboration. The phenomenon probably increases the needed trust [34,37] that the CPB will act in the best interest of the members of the organisation.

In contrast with the existing literature [18,23,35], the findings of this study do not support the conclusion that getting to know the CPB organisation is a decisive screening factor for municipal organisations. Furthermore, this study does not support the conclusion that members emphasise the way of working of the CPB as an important factor for the collaborative to succeed [35], nor does it support the findings in prior studies [18,23,35], where it was found that the composition of the purchasing team was an important factor for organisations to commit to collaborative procurement projects. This contradiction to prior

results might be influenced by the earlier mentioned confidence that is derived from the screening of the other CPB members. The logic behind this trust factor would be as follows: 'if participating in the collaborative is good for an organisation similar to me then it must be good for me too'. Detailed information on the team composition and organisational structure of the CPB seems to be of minor importance.

The factor analysis resulted in one underlying factor that represents the governance mechanism of monitoring the CPB. This factor is intuitively labelled as Direct monitoring/control. In contrast to screening solutions, the post-contract solutions for agency problems [33] are applied, while the CPB executes the joint tenders on behalf of the municipal organisations. The governance mechanism 'direct monitoring or control' is a post-contract solution and therefore relates to the execution of CPB activities.

The findings in this study partially support the findings of earlier research. What stands out in the EFA results is that only direct control measures load on this factor. The items that described indirect monitoring measures did not load on the factors derived from this study. The findings are consistent with the findings of the research conducted by [20], who found that direct monitoring measures were effective in reducing information asymmetry. However, their study was conducted in a project management context without inter-organisation collaboration elements. Research by [2,38] resulted in the (agency) costs for direct control measures being a major barrier to principals adopting these measures. Surprisingly, the fact that respondents in this study emphasised direct control measures seems to contradict this. An explanation for this novelty within the trade-off between monitoring measures and agency costs might be the relatively young age of the CPB in this study. As found by [34], the relationship between members of collaboration becomes closer as the collaboration matures. In this relatively new principal-agent relationship, it might be the case that member organisations need to build up more experience and conviction with the execution of joint tenders to rely on (just) ex ante reports issued by the CPB. The overall conclusion could be that a proactive and direct monitoring system to address information asymmetry between principals and the agent seems to fit a public procurement collaboration in its early life cycle phase. The factor analysis provided two underlying factors that represent guidance as a government mechanism for agency problems. Firstly, the representation of CPB member organisations within the government structure of the CPB is found to be a factor of importance for municipal organisations to align the socio-economic goals with the goals pursued by the CPB. Secondly, direct involvement in working out requirements that address socio-economic goals is ought to result in better goal alignment for the population in this study.

The factor 'representation' withholds measures that see to ways of providing information within the governance structure of the CPB. This finding supports the solutions for information asymmetry provided by [9], who suggests that principals could invest in information systems, such as additional management stages (in this case, the steering and advisory committee). The results of research conducted before the millennium focused on a better information position of the principal, based on the assumption of agent's self-interest. The findings in this study provide evidence for the positive approach introduced by [24,25]. The underlying factor, which consists mainly of items that aim to provide information to the agent, confirms the assumption of honest incompetence [23,24] and guidance provided by the principal as a solution for information asymmetry [18,35].

In contrast with prior research from one item, a priori linked to incentives (INC007) loads on this factor as well. A possible reason for this result is found in the indirect or soft character of the incentives described in this item as follows: the public recognition of the CPB, promises of future commitment, etc., [20]. These characteristics are closely related to the characteristics of the guidance items within this study. In contrast, the (other) classic measures linked to incentive items are either direct outcome-based or direct behaviour-based incentives for the agent [9]. The analysis in this study shows that guiding the agent in the alignment of socio-economic goals ought to contribute to the reduced honest incompetence of the CPB, therefore reducing the level of information asymmetry.



Direct involvement as an explanation factor for agency problems seems to be in contrast with the basic assumption of agency theory. Agency theory assumes a principal–agent relationship where tasks are delegated from principal to agent [9]. The results of this study show that, especially in items where the principal contributes to the execution of the joint tender, responsibilities load on the underlying factor of ‘direct involvement’. Furthermore, the analysis shows that the item that described an indirect approach to reducing goal conflict was deleted, according to the EFA strategy applied. Similar to the explanation of screening category factors, this result could underpin the life cycle development of procurement collaborations [34]. Guiding the CPB via direct involvement might best suit the life cycle phase of this relatively new CPB. The ‘direct involvement’ factor offers a solution for goal conflict, as it consists of measures that are aimed at working out socio-economic goals on behalf of the CPB. Thereby, municipal organisations align their objectives with the objectives pursued within the joint tender most directly.

Conferring to what agency theory indicates, two underlying factors represent incentives as a solution for the agency problem of goal conflict. One factor addresses outcome-based incentives, and the other factor addresses behaviour-based incentives. Structuring incentives form one of the classic solutions for agency problems [9]. The population in this study emphasises outcome-based incentives to align their socio-economic goals with the goals pursued by the CPB. This supports the results derived from [39,40], whose aims of collaborative procurement organisations are clarified when the beneficiaries are known, and where otherwise, may increase difficulties in understanding between organisation members. In other words, as the results of this study suggest, if the outcome-based incentives for the CPB (as beneficiary) are structured well, the level of goal conflict should decrease as a result.

This study also provided a factor that consists mainly of behaviour-based items. Hereby, the actions of the CPB are influenced by offering resources specifically allocated to activities aimed at reaching the socio-economic goals of the principals that provide those resources. This confirms the results of prior research as it is assumed that behaviour-based contracts are especially efficient when the monitoring ability is high [41]. Within the context of this study, there is no direct competition between the CPB and the member organisations, as the CPB is founded by the member municipalities themselves. The monitoring ability, therefore, is assumed to be high, while the activities result in public tender publications.

The ‘Principal’s engagement’ is the solution category with the highest number of deleted items. Therefore, the conclusion could be that this study does not support the findings of the prior literature. For instance, the item PRIN007 (working out parts of the joint tender) comes forward within the guidance factor ‘direct involvement’. Another example can be found in PRIN001 and PRIN002 (representation within the governance structure of the CPB), which come forward within the guidance factor ‘representation’. In contrast with the existing theory [22], the number of deleted items shows that there is no clear evidence for the principal’s engagement as a strong self-contained government mechanism for the agency problems found in this study. Nevertheless, two underlying factors were derived from the factor analysis, which represents the a priori expected construct of principal engagement. Firstly, the population within this study finds goal certainty a factor of importance for municipal organisations to align socio-economic goals with the goals pursued by the CPB. Secondly, dividing tenders into clusters is found to be a measure to overcome the agency problem of goal conflict.

Aiming for goal certainty before municipal organisations (principals) commit to the execution of a joint tender on their behalf supports the assumption of goal conflict and agent’s seeking self-interest [9]. The underlying factor of goal certainty addresses concrete measures that affect goal congruence between municipal organisations and the CPB. Similarly, the factor addresses the development of the procurement organisation to maturity, thereby supporting the findings of [34,39], who found the determination of common objectives by members of the CPB to be one of the elements that determine the life cycle phases of procurement collaborations.

Dividing joint tenders into clusters by the size of municipalities and or geographical region supports the findings of [23,40], who found that goal congruence increases when the physical distance between the principal and agent decreases. Furthermore, the literature not only suggests that the physical distance influences goal congruence within the principal–agent relationship, but other differences between organisations do also. Dividing tenders into clusters, therefore, is a remedy for goal conflict caused by the organisational distance among CPB members and between members and the CPB [19]. Finally, dividing joint tenders into smaller clusters is aligned with the findings of [6], who found that large collaborations are difficult to manage and small collaborations fail to obtain the right amount of expertise. By starting off as a large collaborative and then dividing into clusters, a win–win situation could arise.

Three explorative research questions were stated to structure the research. Through addressing the defining features of the underlying factors, the previous sections embrace the answer to the third research question, What are the defining features of the underlying factors of governance mechanisms, within the specific context of a municipal CPB in The Netherlands? Therefore, to answer the research questions, namely what are the underlying factors of governance that affect (1) information symmetry and (2) goal congruence within the principal–agent relationship of a municipal CPB in the Netherlands? Tables 6 and 7 identify the factors that have been derived from the EFA. Four out of nine factors consist of solutions that affect information symmetry.

**Table 6.** Factors that affect information symmetry.

Screening	Screening the Track Record of the CPB
	Screening the Composition of the Collaboration
Monitoring	Direct monitoring or control
Guidance	Representation of the municipal organisation in the steering and advisory committee of the CPB

**Table 7.** Decisive factors that affect goal congruence.

Guidance	Direct Involvement with the Execution of the Joint Tenders
Incentives	Outcome-based incentives
	Behaviour-based incentives
Principal’s engagement	Achieving goal certainty
	Dividing joint tenders into clusters

The other five factors, derived from the EFA, consist of solutions that affect goal congruence and are presented in Table 7.

Overall, the results of this study support the results of previous studies concerning governance mechanisms for agency problems and the way they have been categorised in prior research. The two basic mechanisms, monitoring and incentives [8], emerge clearly from the analysis.

The literature provided two other solutions to overcome agency problems, which were, respectively, screening [21,33] and principal’s engagement [22]. By providing four underlying factors, this study supports the findings of the research that resulted in these solution categories for agency problems. Within the context of CPP through a CPB, it seems to provide more clarity if screening, hidden information, is recognised as a separate solution category rather than classifying it as a subcategory under monitoring [33]. As discussed, the principal’s engagement category does not seem to be a strong self-contained category of solutions. Looking at the preventive characteristics of the factors derived from the EFA, one could argue that these factors appeal to the assumptions of guidance and therefore should be reordered into this solution category [24,25]. With regard to the

guidance category provided by [25], the results of this study are in line with the assumption of honest incompetence and the corresponding solutions [24]. This research also supports the findings in the prior literature [18,24], arguing that guidance measures can positively affect goal congruence as well as information symmetry. Finally, this study underpins the general structure of the research framework and provides a more precise measurement scale for the agency problem solutions as follows: screening, monitoring, guidance, incentives, and principal's engagement. In general, the results of this analysis support the results of previous studies concerning governance mechanisms for agency problems and the way they have been categorised in prior research. The two basic mechanisms, monitoring and incentives [9], emerge clearly from the analysis.

## 6. Conclusions

The present research aimed to explore what solutions (governance mechanisms) for agency problems within a Dutch municipality–CPB relationship are decisive in aligning socio-economic goals within a collaborative public procurement (CPP) setting. The study adopted an agency theory perspective and, from this perspective, constructed three previously identified research questions. Established from the exploratory factor analysis of primary data, results have been collected via a web-based questionnaire from Dutch municipal organisations; insight was gained into the underlying factors of solutions for agency problems. The analysis resulted in nine factors which supported the general premise of agency theory and the known categorisation of governance mechanisms. To summarise, Table 8 identifies the key factors following solutions for agency problems which were found to be decisive for aligning socio-economic goals within a Dutch municipality CPB relationship.

**Table 8.** Decisive factors for the alignment of socio-economic goals.

Factor Label	Solution Category	Relates to
Track record of CPB	Screening	Information asymmetry
Composition of the collaboration		
Direct monitoring/control	Monitoring	
Representation	Guidance	
Direct involvement	Incentives	Goal congruence
Outcome based (financial)		
Behaviour based (resources)	Principal's engagement	
Achieving goal certainty		
Divide into clusters		

This study shows that the CPP governance items are also applicable within the context of socio-economic objectives for CPP. However, in contrast with previous research [20,21], screening the agent in terms of how their activities aiming to reach socio-economic goals are funded is not a decisive element in agent selection for the population in this study. Likewise, in contrast to prior research [19–21], one item a priori linked to incentives (INC007) loads on this factor as well. A possible reason for this result is found in the indirect or soft character of the incentives described in the following item: public recognition of the CPB, promises of future commitment, etc., [20]. These characteristics are closely related to the characteristics of the guidance items within this study. In contrast, the (other) classic measures linked to incentive items are either direct outcome-based or direct behaviour-based incentives for the agent [9]. Overall, the results of this study support the results of previous studies concerning governance mechanisms for agency problems and the way they have been categorised in prior research.

The literature provided two other solutions to overcome agency problems, which were, respectively, screening [21,33] and principal's engagement [22]. By providing four underlying factors, this study supports the findings of the research that resulted in these solution categories for agency problems. Within the context of CPP through a CPB, it seems to provide more clarity if screening, hidden information, is recognised as a separate

solution category rather than classifying it as a subcategory under monitoring [33]. Besides supporting the existing theory, this study provides additional knowledge in the field of agency theory and collaborative public procurement (CPP). Firstly, the authors of this study designed, developed and tested an original comprehensive measurement scale to conduct research, based on agency theory, within the context of CPP governance, and specifically in the area of central purchasing bodies (CPBs) in the Netherlands. A quite remarkable result of this study is the number of factors that consist of direct control measures. Although shifting tasks to the agent is one of the main conditions of a principal–agent relationship, municipal organisations seem to indicate that they do not want to commit to CPP when it is executed out of sight or out of their direct control. In addition, in contrast with the existing literature, a manageable size of the procurement collaboration seems to be an important defining feature for Dutch municipal organisations to voluntarily join a central purchasing body (CPB). Furthermore, most probably related to the level of experience among or trust in CPB activities, direct monitoring systems, despite their higher agency costs, are preferred by local government agents as a decisive solution for the alignment of socio-economic goals.

Agency theory [42] is enriched through the operationalisation of the underlying factors for solutions to agency problems within this setting, making it possible for future researchers to measure the level of goal congruence and information symmetry based on empirically tested items. Besides the further operationalisation of the classical governance mechanisms (monitoring and incentives), this study especially provides a deeper understanding of relevant items related to non-classical governance mechanisms (screening, guidance, and principal’s engagement). Furthermore, in the field of collaborative public procurement, this study contributes to knowledge via providing additional insight into the decisive elements of organisational design, especially for the most extensive form of procurement collaboration (the central purchasing body) in the Netherlands. By focusing on the alignment of socio-economic goals for public procurement, the results of this study will contribute to what is known about the benefits and barriers of collaborative public procurement. The underlying factors to prevent agency problems extracted from this study might contribute to future research in the field of the development of CPP organisations during their life cycle.

The results of this study are applicable in practise on the administrative and management level. Municipal organisations that initiate and/or govern a central purchasing body can take the results of this study into account in order to guide the further development of the CPB organisation. Combined with the knowledge of prior research in the field of CPP life cycle development, the results of this study are useful in streamlining the expected change in the pursuit of goals by members of a CPB. One can prevent a high level of dropouts via the preventive implementation of the governance mechanisms derived from this study. On a managerial level, this study provides useful insights for decision-makers in municipal organisations. They can better assess the way a CPB carries out the joint tenders at hand and determine if the joint approach delivers the best results in terms of their objectives.

#### *Limitations and Future Research*

The main strength of this study is the focus on a general type of collaborative public procurement and how the distinct set of socio-economic goals for procurement could be aligned within this form of collaboration. The aim of this specific research area provides useful results to govern specifically that type of organisation and that type of procurement goal. Taking into account the research method and target population, this study has been conducted in the business environment of the public sector in the Netherlands.

However, the authors acknowledge that this study has only employed a quantitative research approach. Through incorporating qualitative research approaches alongside the quantitative analyses, the authors understand that it would have assisted in the identification of key themes and patterns, which would provide richer descriptions of the issues

around CPP that the quantitative methods employed were not fully able to achieve. Furthermore, through the adopted quantitative approach, this study applies an explorative perspective to generalise, which limits the ability to infer the extent to which the proposed governance mechanisms have an impact on the level of goal congruence and information symmetry. Likewise, this study only adopts the principal perspective of the principal–agent relationship, which influences the alignment of socio-economic goals. For instance, the level of trust between principals and the agent is seen as a possible explanation for the results derived from this study. However, the analyses in this study were not controlled via a measurement of the level of trust. The same goes for the explanation of the results related to the early life cycle phase of the CPB studied. Future studies might compare the results of the principal–agent relationships of CPBs in different life cycle phases to support or reject this explanation. Finally, this study has been conducted throughout the whole target population without addressing a specific case or commodity. This limited the ability to control variables that could influence the response provided. Certain conditions of joint tenders by a CPB could have been experienced by one or several respondents and not by the others. This limitation could be overcome through researching a distinct case (a specific joint tender by a specific CPB).

Future research is necessary to overcome the limitations presented in the previous paragraphs. First, research into different forms of CPP would further enrich the knowledge on governing CPP organisations. This could answer the following question: Does the organisational form of CPP influence the effectiveness of governance mechanisms for agency problems? Related to this type of research question, future research could focus on the comparison of results between different structures of CPP organisations in different life cycle stages. Secondly, via answering the question To what extent do governance mechanisms influence agent’s behaviour?, future research could take up both the principal and agent side of the relationship to further deepen the understanding of the relational constructs, and could also include comparative studies of different forms of CPP, investigations of agents’ behaviour in governance relationships, and case studies to quantify the impact of proposed governance mechanisms on goal alignment in collaborative procurement. It would also be useful to explore the influence of the life cycle of procurement organisations on the effectiveness of governance mechanisms. Furthermore, work could also progress into the category of principal’s engagement. Finally, this study could be followed by a case study that quantifies the effect of the proposed governance mechanisms on the level of goal congruence and information symmetry within a CPP setting. The following research question is proposed for future research: To what extent do the different governance mechanisms in a principal-agent relationship and CPP setting influence the degree of goal congruence and information symmetry?

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## Appendix A. Rotated Pattern Matrix—After Item Deletion

	Factors								
	1	2	3	4	5	6	7	8	9
GUI004	0.792				-0.212				
GUI005	0.684					0.295			
GUI003	0.616			-0.269			0.233		
GUI002	0.520						0.257		
INC007	0.424								
INC005		0.912							
INC006		0.758							
INC004	-0.219	0.712						-0.202	
SCR001			-0.879						
SCR002			-0.752						
SCR008			-0.635		0.289				
SCR007			-0.623		0.262				
MON005				0.838					
MON004				0.587					
MON006				0.549			0.215		
MON003				0.464					
PRIN008					0.736				
PRIN009					0.582				-0.240
PRIN005						0.823			
PRIN004						0.619			
GUI007							0.863		
GUI008							0.837		
GUI001	0.437						0.571		
INC002								-0.750	
INC001								-0.711	
SCR003									0.574
SCR004			-0.298						0.560

Extraction method: principal axis factoring. Rotation method: Oblimin with Kaiser normalisation [31]. Rotation converged in 17 iterations.

### Appendix B. Total Variance Explained—Initial Factor Extraction

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.245	23.704	23.704	8.866	22.733	22.733
2	3.358	8.610	32.314	3.047	7.812	30.545
3	2.882	7.389	39.704	2.536	6.502	37.047
4	2.450	6.282	45.986	2.053	5.265	42.312
5	1.988	5.098	51.084	1.641	4.207	46.519
6	1.740	4.462	55.546	1.353	3.469	49.988
7	1.449	3.715	59.261	1.054	2.704	52.692
8	1.295	3.320	62.581	0.879	2.254	54.945
9	1.163	2.982	65.562	0.757	1.941	56.886
10	1.113	2.853	68.415	0.717	1.839	58.725
11	1.032	2.647	71.062	0.645	1.655	60.380
...	0.952	2.441	73.503			
39						

Extraction method: principal axis factoring.

### Appendix C. Total Variance Explained—Factor Extraction after Item Deletion

Factor	Total Variance Explained			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.361	23.558	23.558	6.006	22.245	22.245	3.684
2	3.033	11.235	34.793	2.703	10.010	32.255	2.447
3	2.389	8.850	43.642	2.095	7.760	40.015	3.610
4	1.822	6.748	50.390	1.460	5.408	45.422	2.510
5	1.650	6.112	56.503	1.271	4.706	50.128	2.089
6	1.536	5.687	62.190	1.132	4.194	54.322	1.480
7	1.219	4.516	66.706	0.828	3.067	57.389	3.227
8	1.100	4.075	70.781	0.702	2.599	59.988	2.732
9	1.021	3.780	74.561	0.603	2.232	62.221	1.403
...	0.770	2.851	77.412				
27							

Extraction method: principal axis factoring. <sup>a</sup>. When factors are correlated, the sums of squared loadings cannot be added to obtain a total variance.

Appendix D. *t*-Test

		Independent Samples Test								
		Levene's Test for Equality of Variances		<i>t</i> -Test for Equality of Means						
		F	Sig.	t	df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
SCR001	Equal variances assumed	0.034	0.854	-0.639	56	0.525	-0.138	0.216	-0.570	0.294
	Equal variances not assumed			-0.639	55.574	0.525	-0.138	0.216	-0.570	0.294
SCR002	Equal variances assumed	0.562	0.457	0.319	56	0.751	0.069	0.216	-0.364	0.502
	Equal variances not assumed			0.319	55.277	0.751	0.069	0.216	-0.365	0.502
SCR003	Equal variances assumed	1.064	0.307	-0.754	56	0.454	-0.207	0.274	-0.756	0.343
	Equal variances not assumed			-0.754	54.188	0.454	-0.207	0.274	-0.757	0.343
SCR004	Equal variances assumed	2.286	0.136	-1.844	56	0.071	-0.448	0.243	-0.935	0.039
	Equal variances not assumed			-1.844	53.640	0.071	-0.448	0.243	-0.936	0.039
SCR005	Equal variances assumed	0.399	0.530	-1.348	56	0.183	-0.276	0.205	-0.686	0.134
	Equal variances not assumed			-1.348	55.043	0.183	-0.276	0.205	-0.686	0.134
SCR006	Equal variances assumed	0.124	0.726	-0.726	56	0.471	-0.172	0.237	-0.648	0.303
	Equal variances not assumed			-0.726	55.419	0.471	-0.172	0.237	-0.648	0.303
SCR007	Equal variances assumed	0.705	0.405	-0.752	56	0.455	-0.172	0.229	-0.632	0.287
	Equal variances not assumed			-0.752	55.822	0.455	-0.172	0.229	-0.632	0.287
SCR008	Equal variances assumed	3.982	0.051	-0.542	56	0.590	-0.138	0.255	-0.648	0.372
	Equal variances not assumed			-0.542	54.444	0.590	-0.138	0.255	-0.648	0.372
MON001	Equal variances assumed	0.440	0.510	-0.612	56	0.543	-0.138	0.225	-0.589	0.314
	Equal variances not assumed			-0.612	55.820	0.543	-0.138	0.225	-0.589	0.314
MON002	Equal variances assumed	0.107	0.745	-0.755	56	0.453	-0.172	0.228	-0.630	0.285
	Equal variances not assumed			-0.755	55.998	0.453	-0.172	0.228	-0.630	0.285
MON003	Equal variances assumed	0.193	0.662	-0.456	56	0.650	-0.103	0.227	-0.558	0.351
	Equal variances not assumed			-0.456	55.666	0.650	-0.103	0.227	-0.558	0.351

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-Test for Equality of Means							
		F	Sig.	t	df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
MON004	Equal variances assumed	0.522	0.473	-0.571	56	0.570	-0.138	0.242	-0.622	0.346	
	Equal variances not assumed			-0.571	54.035	0.570	-0.138	0.242	-0.622	0.346	
MON005	Equal variances assumed	0.426	0.516	-0.775	56	0.441	-0.172	0.222	-0.618	0.273	
	Equal variances not assumed			-0.775	55.999	0.441	-0.172	0.222	-0.618	0.273	
MON006	Equal variances assumed	1.391	0.243	-0.596	56	0.553	-0.138	0.231	-0.601	0.325	
	Equal variances not assumed			-0.596	55.649	0.553	-0.138	0.231	-0.601	0.326	
PRIN001	Equal variances assumed	1.501	0.226	-1.038	56	0.304	-0.207	0.199	-0.606	0.192	
	Equal variances not assumed			-1.038	51.400	0.304	-0.207	0.199	-0.607	0.193	
PRIN002	Equal variances assumed	1.249	0.269	-0.097	55	0.923	-0.018	0.190	-0.399	0.362	
	Equal variances not assumed			-0.098	53.452	0.923	-0.018	0.189	-0.398	0.361	
PRIN003	Equal variances assumed	1.046	0.311	-0.658	56	0.513	-0.172	0.262	-0.698	0.353	
	Equal variances not assumed			-0.658	55.206	0.513	-0.172	0.262	-0.698	0.353	
PRIN004	Equal variances assumed	0.024	0.878	0.646	56	0.521	0.172	0.267	-0.362	0.707	
	Equal variances not assumed			0.646	55.817	0.521	0.172	0.267	-0.362	0.707	
PRIN005	Equal variances assumed	1.941	0.169	-0.396	56	0.694	-0.103	0.261	-0.627	0.420	
	Equal variances not assumed			-0.396	52.675	0.694	-0.103	0.261	-0.628	0.421	
PRIN006	Equal variances assumed	0.034	0.855	-0.886	56	0.379	-0.241	0.272	-0.787	0.304	
	Equal variances not assumed			-0.886	55.894	0.379	-0.241	0.272	-0.787	0.304	
PRIN007	Equal variances assumed	1.132	0.292	-1.224	56	0.226	-0.276	0.225	-0.727	0.176	
	Equal variances not assumed			-1.224	54.356	0.226	-0.276	0.225	-0.728	0.176	
PRIN008	Equal variances assumed	0.247	0.621	0.577	56	0.566	0.103	0.179	-0.255	0.462	
	Equal variances not assumed			0.577	54.960	0.566	0.103	0.179	-0.256	0.463	
PRIN009	Equal variances assumed	1.078	0.304	-0.722	56	0.473	-0.172	0.239	-0.651	0.306	
	Equal variances not assumed			-0.722	55.641	0.474	-0.172	0.239	-0.651	0.306	

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-Test for Equality of Means							
		F	Sig.	t	df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
PRIN010	Equal variances assumed	0.957	0.332	-1.992	56	0.051	-0.414	0.208	-0.830	0.002	
	Equal variances not assumed			-1.992	55.958	0.051	-0.414	0.208	-0.830	0.002	
INC001	Equal variances assumed	1.870	0.177	-0.433	56	0.666	-0.103	0.239	-0.582	0.375	
	Equal variances not assumed			-0.433	52.357	0.667	-0.103	0.239	-0.582	0.376	
INC002	Equal variances assumed	1.196	0.279	-0.248	56	0.805	-0.069	0.278	-0.625	0.487	
	Equal variances not assumed			-0.248	54.856	0.805	-0.069	0.278	-0.625	0.487	
INC003	Equal variances assumed	0.176	0.677	0.724	56	0.472	0.172	0.238	-0.305	0.650	
	Equal variances not assumed			0.724	55.581	0.472	0.172	0.238	-0.305	0.650	
INC004	Equal variances assumed	0.347	0.558	-0.486	56	0.629	-0.138	0.284	-0.706	0.430	
	Equal variances not assumed			-0.486	55.988	0.629	-0.138	0.284	-0.706	0.430	
INC005	Equal variances assumed	0.255	0.616	-0.718	56	0.476	-0.207	0.288	-0.784	0.370	
	Equal variances not assumed			-0.718	55.887	0.476	-0.207	0.288	-0.784	0.370	
INC006	Equal variances assumed	0.618	0.435	-0.465	56	0.644	-0.138	0.296	-0.732	0.456	
	Equal variances not assumed			-0.465	55.117	0.644	-0.138	0.296	-0.732	0.456	
INC007	Equal variances assumed	0.003	0.957	0.433	56	0.667	0.103	0.239	-0.375	0.582	
	Equal variances not assumed			0.433	56.000	0.667	0.103	0.239	-0.375	0.582	
GUI001	Equal variances assumed	0.050	0.823	-1.796	56	0.078	-0.414	0.230	-0.875	0.048	
	Equal variances not assumed			-1.796	55.364	0.078	-0.414	0.230	-0.875	0.048	
GUI002	Equal variances assumed	0.373	0.544	0.146	56	0.885	0.034	0.236	-0.439	0.508	
	Equal variances not assumed			0.146	55.507	0.885	0.034	0.236	-0.439	0.508	
GUI003	Equal variances assumed	0.884	0.351	-0.149	56	0.882	-0.034	0.231	-0.497	0.429	
	Equal variances not assumed			-0.149	54.852	0.882	-0.034	0.231	-0.498	0.429	
GUI004	Equal variances assumed	0.667	0.417	-0.569	56	0.572	-0.138	0.243	-0.624	0.348	
	Equal variances not assumed			-0.569	55.317	0.572	-0.138	0.243	-0.624	0.348	



		Independent Samples Test									
		Levene's Test for Equality of Variances		t-Test for Equality of Means							
		F	Sig.	t	df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
GUI005	Equal variances assumed	0.869	0.355	-0.296	56	0.768	-0.069	0.233	-0.535	0.397	
	Equal variances not assumed			-0.296	54.859	0.768	-0.069	0.233	-0.535	0.398	
GUI006	Equal variances assumed	0.028	0.868	0.296	56	0.768	0.069	0.233	-0.397	0.535	
	Equal variances not assumed			0.296	55.921	0.768	0.069	0.233	-0.397	0.535	
GUI007	Equal variances assumed	0.372	0.544	0.311	56	0.757	0.069	0.222	-0.375	0.513	
	Equal variances not assumed			0.311	55.403	0.757	0.069	0.222	-0.375	0.513	
GUI008	Equal variances assumed	1.361	0.249	-0.692	54	0.492	-0.179	0.258	-0.696	0.339	
	Equal variances not assumed			-0.692	52.518	0.492	-0.179	0.258	-0.697	0.339	

### Appendix E. Cronbach's Alpha

Item: Total Statistics				
	Scale Mean if Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SCR001	127.16	246.954	0.360	0.891
SCR002	127.44	246.230	0.332	0.892
SCR003	127.91	252.526	0.099	0.896
SCR004	127.60	243.175	0.452	0.890
SCR005	127.38	246.822	0.395	0.891
SCR006	127.34	244.672	0.456	0.890
SCR007	127.14	243.717	0.488	0.890
SCR008	126.98	240.174	0.584	0.888
MON001	127.03	240.494	0.616	0.888
MON002	127.20	241.541	0.539	0.889
MON003	127.51	242.194	0.467	0.890
MON004	127.37	244.758	0.379	0.891

	Item: Total Statistics			
	Scale Mean if Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
MON005	127.86	246.280	0.354	0.891
MON006	127.85	244.287	0.398	0.891
PRIN001	127.72	244.514	0.375	0.891
PRIN002	127.35	244.423	0.418	0.891
PRIN003	127.31	240.914	0.461	0.890
PRIN004	127.74	250.738	0.129	0.896
PRIN005	127.78	244.407	0.339	0.892
PRIN006	127.63	241.402	0.442	0.890
PRIN007	127.44	242.152	0.483	0.890
PRIN008	127.39	245.911	0.404	0.891
PRIN009	127.29	241.838	0.497	0.889
PRIN010	127.83	244.280	0.454	0.890
INC001	127.57	243.995	0.419	0.891
INC002	127.79	239.023	0.537	0.888
INC003	127.37	244.972	0.371	0.891
INC004	128.57	246.306	0.280	0.893
INC005	128.29	248.945	0.177	0.895
INC006	128.17	243.620	0.339	0.892
INC007	127.38	243.984	0.400	0.891
GUI001	127.48	242.058	0.495	0.889
GUI002	127.38	244.220	0.444	0.890
GUI003	127.16	247.303	0.346	0.892
GUI004	127.32	246.180	0.382	0.891
GUI005	127.23	246.451	0.366	0.891
GUI006	127.41	245.526	0.406	0.891
GUI007	127.81	243.885	0.437	0.890
GUI008	127.82	240.190	0.489	0.889

## Appendix F. Factor Correlation Matrix

Factor	Factor Correlation Matrix											
	1	2	3	4	5	6	7	8	9	10	11	
1	1.000											
2	0.132	1.000										
3	-0.145	-0.105	1.000									
4	0.206	0.055	-0.182	1.000								
5	0.162	0.084	-0.121	0.222	1.000							
6	-0.003	0.111	0.088	0.188	0.094	1.000						
7	-0.168	-0.149	0.166	-0.203	-0.184	-0.090	1.000					
8	0.142	0.135	-0.325	0.160	0.142	0.033	-0.100	1.000				
9	-0.131	-0.004	0.061	0.001	-0.107	-0.104	0.093	0.011	1.000			
10	0.124	-0.027	-0.253	0.019	0.368	0.025	-0.169	0.108	-0.223	1.000		
11	-0.257	-0.236	0.263	-0.101	-0.187	-0.066	0.314	-0.182	0.257	-0.272	1.000	

Extraction method: principal axis Factoring. Rotation method: Oblimin with Kaiser normalisation [31].

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