Will more trust lead to less complete contracts in infrastructure projects?

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Although “more trust in contractors” is the adopted business philosophy for Dutch Rijkswaterstaat, their contracts for infrastructure projects are still complete and quite detailed. Why does not the campained more trustworthy market relation lead to less incomplete contracts for infrastructure projects, as theory suggests and contractors ask for?

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1 Introduction

1.1 Background

At the beginning of this decade, Dutch 'Rijkswaterstaat' (the infrastructure division of the Ministry of Transport) had the vision that template contracts should change from the input-centred type used until that time, i.e. contracts specific on all activities and dimensions, to an output-centred type. Nevertheless, in 2010, as a senior buyer (employed by this public authority) I still experience on a daily basis that contracts are increasing in size and complexity. Although the output is now specified in “functions of the desired product”, typical contracts still require a complete set of rules, quality assurance plans, verification and validation prescripts etc., restricting the contractor’s own input. The entire process of contract management, technical management, organisation management and interaction management is prescribed nearly in full. As a result, the contractor has to fulfil all documented specifications and checks, despite the fact that such detailed prescriptions do not very often reflect the way the contractor is organised or would prefer to work.

The process prescriptions mentioned above are used for controlling the implementation of the project. The underlying belief is that when the contractor follows pre-specified rules, the outcome of the process will meet the specified standards and the contractor can be trusted. At the same time, however, contract managers at Rijkswaterstaat are concerned that the amount of paperwork required will distract the focus from the real risks encountered in projects. They also believe that it becomes unlikely that there will be any better understanding or trust between contract parties as a result of the huge amount of paperwork required or the prescribed processes. Knowledge if such beliefs are justified would be very helpful to public work procurement agencies like the one that employs me. It would also further facilitate our learning about theories that offer insights into this problems as well as the testing of these theories against practice.

Although the stated policy of Dutch administration is to “leave more to the market” the contracts recently signed for infrastructure projects generally seem to become more 'complete' and prescriptive. As Incomplete Contract theory suggests, the parties can, in principle, specify their respective rights and duties for every possible future state of the world, and at the expense of larger contracting costs, complex infrastructure contracts could indeed be made complete. However, complete contracts could also lead to mistrust between contracting parties, whereas social controls might, on the contrary, lead to more trust between them (Das, 1998). When there is no prior experience between parties, and therefore more fear of opportunistic behaviour, contracts seem to get more comprehensive and 'complete' (Lu and Ngoi, 2001). These theories and hypotheses are difficult to reconcile with the following puzzling observation: although Dutch Rijkswaterstaat (RWS) has a stated policy to leave more to the market and to trust and rely on the market (see ‘inkoopstrategie’ in Agenda 2012), its contracts seem to get more and more complete. The phenomenon is unlikely to be the result of previous market experience, as pre selection of contracting parties and quality of plans and skills are now commonly used in this area. The stated change of contracting policy in the public sector from "specified input contracts" to "output contracts", with associated risks shifting to the contractor, should normally have led to exactly the opposite phenomenon: more "incomplete" contracts. In such contracts, with more risks transferred to contractors, less controls should be designed and less process requirements should be specified in the contract.

From practice and experience, it appears to me that the largest portion (over 50%) of contract requirements do not contribute directly to the desired outcome or function and may be instead related to some form of mistrust. The purpose of this study is therefore to gain insights into why a public sector favours the use of complete contracts and therefore mistrusts contractors' capability to organize and to act properly on their own. Mistrust appears to be counter-productive: it leads to
additional paperwork, without offering additional risk insurance, and as such it distracts parties from addressing real risks associated with the projects.

The starting point of my thesis project is thus based on direct observation derived from the contracting policy guidelines that Rijkswaterstaat introduced a few years ago. The best way to describe the new contracting policy is a brief summary of the RWS Bussinesplan.

The following excerpt from RWS Bussinesplan: ‘Agenda 2012’ is an indicative statement of the policy changes aimed for:

“Dutch Society wants a government that performs better with less staff employed. This is why RWS transitions to a professional principal role. Work carried out by Rijkswaterstaat employees that could be done by others on the market will be left to the private sector. Especially new infrastructure, and maintenance of existing infrastructure, are a matter to be dealt with by construction firms. RWS is moving to a more managerial role instead of the executing officer role and will become more of a buyer instead of a builder. With innovative contract design both advising consultants/engineers and contractors will have more room to execute contracts by their own understanding. This will encourage the market to find affordable and innovative solutions and work more efficient”.

1.2 Motivation

Over the last period of 5 years Rijkswaterstaat has clearly intended to move away from input based contracts to output specified contracts.

Input based contracts usually left all risk with the principal, and payments were committed and made as initially set. Contracts concluded nowadays transfer most risks to the contractor. For Design Build Finance Maintain (“DBFM”) contracts, almost all constructions risks are transferred to the contractor. Nevertheless, risks involved with the public using facilities are not always transferred, as payment will in most cases be related to the availability instead of the number of cars safely using the infrastructure. In these cases the contractor must keep the infrastructure it has produced available at certain quality and safety level. Also, the maintenance over the contracting period is left to the contractor. The related specific tasks from an infrastructure provider standpoint (for instance, incident management, traffic motion control and all legal tasks as a road holder) are not transferred however. In conclusion, although a significant portion of risks are transferred, RWS remains, both legally and politically, responsible for the service offered to the public. As a result, it finds it difficult to 'leave it to the market' without controlling the work that the market achieves, and recently output contracts tend to become over-complex, both from a technical point of view, as well as from a process management one. Annex A includes an exhibit of a current typical RWS contract outline.

Similarly to the goals established in its previous Agenda, RWS has set in its Agenda for 2012 to achieve a reduction of transaction costs, and to complete infrastructure projects together with the market within set limits. These goals, together with slogans, like “keep it simple”, “first common sense, then rules”, “don't use artillery to fight a bug”, do stress the way RWS wants to go. Another interesting statement is made in the Agenda: leaving things to the market is only possible when there is trust that the market party is willing to deliver the right goods or services.

Concluding in its stated goals, RWS aims for a new way of structuring the principal - agent relationship, by shifting contract design from input to output specifications and by transferring risks more and more to the market. As emphasized in the Agenda 2012, these aims are only possible to achieve with trust in the ability and goodwill of the market.

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1 RWS, ondernemingsplan, agenda 2012
But do contemporaneous contracts show in fact more trust and are they more or less incomplete than before the policy change? On the contrary, they appear to have grown over-complete, to prevent and counteract any potential opportunistic behaviour of Contractors. This apparently puzzling development needs to be evaluated correctly and understood.

1.3 Relevance

In contracting between two parties there is always concern that the other party might not fulfil its commitments as expected. In many transactions very detailed contracts try to specify the rights and commitments of each party. The do’s and don’t’s are major sections in these contracts. Although they specify all requirements and processes, still concerns persist on whether a contract is likely to lead to the desired outcome. The risks related to opportunistic behaviour can actually lead to financial loss, technical construction failures, political and government policy troubles and even legal issues.

As it is desired that the contracted party fulfil their obligations, it can be very important that the inter-firm relationship is monitored carefully and in great detail, although it would be much favourable if the contracted party could be trusted to do things the way things should be done. Even more, agency costs, administration and discussions could be saved and avoided with enough ‘trust’ in place to realize the goals and objectives. Finding the right balance between control and trust seems difficult, especially in the context of Public Private Partnerships (“PPP”) contracts.

PPP contracts are increasing in popularity as there are a number of potential advantages in adopting the PPP policy for the provision of government services. Value for money appears to be the main rationale for the use of PPP’s. This would entail providing the infrastructure asset and any ancillary services at least cost compared to conventional government procurement. This is based on the assumption that quality standards are maintained as per the contract specifications. Risk transfer is another potential benefit. In essence, the party best able to manage risks at least cost should manage it. PPP’s allow for greater predictability of costs for the government and revenues for the private company since both of these are articulated in the contract (Sciulli, 2008). Other advantages mentioned in literature are the spread of funds over a lengthy period although this long term agreement can also be a disadvantage when changing circumstances or needs make a renegotiation necessary.

Apparently, contracts are written starting from a perception of mistrust, and as a result, they consist of a large number of behavioural controls explicitly stated in the contract.

From both a theoretical and practical perspective, it would be useful to determine whether there could be a prominent role for trust in complex public work contracts and whether more trust would ultimately lead to better performances.

Could more trust prevent contract writers from creating even larger and more complex contracts? Can trust replace formal controls or are the latter better to manage a contract? To answer such questions, it is necessary to know how a contract is used and interpreted, as this may have an important impact on the issues mentioned before.
2 Theoretical framework and research question

2.1 Theoretical framework

This study is based on the existing academic literature on trust, control and contracts.

The incomplete contracts theory (Hart and Moore, 1988) puts forward the idea that contracts are usually incomplete because it would be prohibitively expensive to write a complete contract. When a dispute arises and the specific situation is not included in the contract, either both parties must engage in bargaining or the court must step in and fill the gap. The idea of a complete contract is closely related to the notion of default rules, e.g., legal rules that will fill the gap in a contract in the absence of a provision agreed upon by all parties. More recent developments in the theory of incomplete contracts turn the focus on the incentive effects of parties' inability to write complete contingent contracts, e.g., concerning relationship-specific investments. Because it would be impossibly complex and costly for parties to come to an agreement to make their contract complete, the law provides default rules which fill in the gaps in the actual agreement of the parties.

In their paper on contractual flexibility for public private partnerships, Athias et al. (2007) describe the trade off between rigid and flexible contracts. They suggest that although a more rigid contract for long term PPS infrastructure projects can only be favourable over a flexible contract if certain conditions are met. The conditions mentioned were: maladaptation costs, renegotiation costs, and the probability to see the contract enforced and met. Furthermore their results stress the fact that the institutional environment in which the contract is embedded matters.

Other insights come from agency theory. Trailer et al. [2004] consider that many of the reported difficulties in realizing the benefits of PPPs emanate from conflicting goals between three major PPP stakeholders. The first one is the public authority, whose objectives are job creation and increasing services to the public. The second is the private partner, whose objective is to maximize the value derived from the arrangement. The third party is the consumer or the community, whose aim to maximize consumer surplus/social welfare. In highlighting this “compound agency problem”, i.e., multiple conflicting interests created by the multiple parties involved, Trailer et al. flag the potential for conflicting incentives and interests present in PPP arrangements to produce negative social consequences in public infrastructure and service provision.

In the literature on trust, controls and contract in inter-firm relationships, several interesting hypotheses are presented. Das and Teng (2001) investigated the relationship between trust and contract and concluded that trust and contracts can well complement because contracts are in practice often not used and interpreted in a strictly legal fashion, with opportunism as a central focus point. This suggests that when trust in the partner is high, the formal controls are seldom used and of less importance. Das and Teng (2001) also consider that perceived relational risk in an alliance will be reduced more effectively by behaviour control than by output control, although output control is more effective to reduce the perceived performance risk in an alliance. Perceived performance risk in an alliance will be reduced more effectively by output control than by behaviour control. Their fifth hypothesis: “Social control in an alliance will reduce both perceived relational risk and perceived performance risk” can and should be further investigated.

Klien et al. (2006) also argue that contracts and trust need not be substitutes, but actual complements. Indeed, formal control — that is, behaviour control and output control — may undermine trust, because the employment of strict rules and objectives means that members do not have the autonomy to decide what works best. Members’ goodwill is thrown in doubt. As a result, an atmosphere of mistrust is created. Social control, on the other hand, influences people’s behaviour through creating shared goals and norms. This process increases mutual understanding — and is thus trust-breeding. Whereas the above argument is primarily concerned with goodwill trust, a similar logic would apply to competence trust. First, when specific outcome measures (or output controls) are used in an
alliance, the implication is that a firm does not fully trust the competence of its partner to decide what is best for the alliance. A lack of trust leads to the conclusion that outcomes need to be frequently checked against preset measures and objectives. An emphasis on outcome measures can also create the impression that a partner needs to meet the targets on its own. Such an impression of being left to its devices in situations involving downside risk may also create anxieties that could erode competence trust. Furthermore, output control gives partner firms little leeway in pursuing long-term objectives at the cost of certain short-term targets, because alliance outcomes will be constantly and closely monitored.

Klien et. al (2006) have, on the other hand, shown why “trust and contracts can well be complements because contracts are in practice often not used and interpreted in a strictly legal fashion with opportunism as a central focus point”. The authors advise that studies should not be pointed at the presence, completeness or existence off the contract, and suggest that further research should focus on:

1 the precise content of clauses included,
2 the intention with which the contract is drawn up,
3 the actual use of the contract.

In conclusion, the relationship between contracts and trust has been subject of many studies, the consensus in the literature is that trust and contracts are substitutes, and the following correspondence should generally hold:

![Figure 1: Relation trust and contract completeness](image)

When trust is high, there is no need for complete contracts.

If, however, the actual observations do not confirm this theoretical proposition, it does not automatically follow that the theory is false; trust and contracts might only misleadingly appear to be complements, not substitutes, because “contracts are in practice often not used and interpreted in a strictly legal fashion”.

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2.2 Research objective

According to prior studies, most contracts consist of a mix of desired behaviour clauses and specified performance provisions. In the case of infrastructure projects, however, the appeal of specifying the desired behaviour, in addition to the desired outcome, and both contracting parties’ role in it, is often not clear. The question is: “Why are contracts structured to include process requirement provisions?” If such clauses are reflective of mistrust, then it follows that the incentives/disincentives provided for in contracts would be related to the main risks. Is this the case in reality? We can learn whether this is indeed the case or not, from existing contracts, their content and their actual enforcement.

As suggested in prior literature, useful insights would be gained by examining not only the content but also the actual use of contracts and thus determine whether the contract completeness at RWS is a result of actual mistrust, as reflected in process requirements and quality requirements, or whether it is in fact the consequence of exogenously imposed factors, e.g. regulations like NEN quality, ARBO, financial statements regulations or, possibly, the specifics of the required outcome, e.g. the complexity of infrastructure projects is quite high, requiring the drawing up of very complex contracts.

From practitioners’ perspective, it is considered that two different approaches to PPP could be taken: contracting based primarily on trust as reflected in slim/compact contracts and contracting based on all encompassing contracts. Why these two different approaches are chosen and how they work out is important to public work authorities. The study might explain why contracts get ever more comprehensive, although the opposite, i.e. leaner contracts should have been more likely to transpire, given the political idea of leaving it up to the market. Finally, the research may shed light on the connection between social controls and trust.

The main objective of this thesis remains, however, to explore and identify the factors, mistrust or some other factor, that drive the observed increase in contracts completeness in public work procurement at RWS, given that the ‘new’ policy agenda this public institution has set is to operate in a more open and constructive way, with outcome based results clearly specified.

An answer to this question could be found by investigating how contract managers design actual public work procurement contracts, determine the proportion of “controls” to be found in their content, and inquire about the motivation they have for placing such “controls” in contracts.

A second objective of the study is assess whether contracts based on output control, i.e. based on trust in the quality and ability of the contract partner, are perceived as equally likely to get the desired outcome as much as the complete contracts designed and used currently.

An answer to this question could be found by researching how contract managers interpret and actually enforce public work procurement contracts.

Before data collection and analysis are performed, a tentative answer to the following questions must be also provided:
- How is “trust” reflected in contracts? What content clause type reflects the degree of trust in practice (e.g. behaviour control)?
- What is understood by the term Social Control? Can social controls replace behavioural controls? Can trust be based on social controls and (limited?) output controls? What is the role of third parties in these relationships?
3 Methodology

3.1. Research methods description

This study is empirical and exploratory. It uses qualitative and quantitative data collected from the contents of several PPP contracts and interviews with contract managers in order to find out what factor drives the tendency of these Dutch infrastructure contracts toward complexity and comprehensiveness, i.e. complete contracts.

This case study analysis is performed on 3 public work infrastructure contracts: two PPP contracts and a long-term public procurement contract (design, construct and maintain over a 10 year period). Direct interviews are also conducted to assess the actual use of contractual provisions in order to validate whether this tendency bears a relationship with existing mistrust in the private market partners. Additionally, a comparison to a more or less incomplete infrastructure contract gives additional information on what kind of issues are unforeseen in the incomplete contract that do exist in a complete contract. Finally, the analysis is geared toward finding out whether there are differences in the way the two different types of contracts are designed and actually enforced.

As mentioned, the research is aimed at exploring how PPP contracts are designed, interpreted and enforced. The major part of this research is a case study, which contrasts two comprehensive 'complete' contracts and a lean 'incomplete' contract in order to get more insight into the drivers of the differences in approach.

Based on collected data and observations, an analysis was made to determine whether a “complete” contract is indeed perceived as necessary to build efficient inter-firm relationships and obtain good results, or whether, possibly, some limited output control, based upon trust in the quality and ability of the contract partner, would also suffice to achieve the desired outcome.

3.2. Concepts operationalization

Firstly, it is necessary to establish what types of controls and clauses in contracts reflect the degree of trust.

In practice, trust could be entirely based on experience and tacit knowledge. Thus, it is uncertain which types of controls provided for in contracts are indeed a reflection of the existing degree of mistrust. Nevertheless, process requirement clauses, which specify a contractor how he should design, build, organise, maintain, audit, verify or manage the work or technical requirements that are 'input based', are more likely to reflect mistrust than clauses that prescribe the use of laws, general processes or standards.

As mentioned before, the main hypothesis investigated in this research project is that more complete contracts are evidence of less trust in contractors and that the lack of trust justifies why managers and contract writers are focusing on process instead of goals and results. In this study, mistrust is a term used interchangeably with the terms “perceived performance risk” and “relational risk”.

The Concept of Mistrust is operationalized as the sum of any requirement stated in a contract which prescribes the way the desired outcome is to be achieved, but which, on its own, does not lead to the desired outcome. An example is the auditing process required for ISO 9001\(^2\). On its own, the

\(^2\) International Organization for Standardization, responsible for the ISO 9000, ISO 14000, ISO 27000, ISO 22000 and other international management standards.
fulfilment of this requirement does not contribute to the construction of for example, a bridge, but
gives confidence and guarantees about the way it is achieved.

By categorising the precise content of clauses included in a contract, it becomes possible to establish
which clauses are mistrust-related and their relative proportion in a very comprehensive contract.
Categorization also allows the comparison of differences in the amount of requirements or
specifications between contracts. The percentages of categories of requirements (process
requirement, specified technical input or desired output) are contrasted.

Secondly, the term “Social control” and its relationships with contracts and trust needs defining.

Social control can best be described as an attitude, a positive behaviour, towards realizing a shared
goal. Teamwork and reliance on each others task can be seen, for example, in a soccer team, where it
is clear that victory can only be achieved by scoring more goals then the opposing team. For a team
it is also clear that in a team of 11 players it will be possible only for one or somew few players to
score goals. Nevertheless the other team members are essential to secure a win, as a good defence
system is also a must. In a soccer team the social control is obvious, and witnessed by thousands of
‘experts’ the fans will not hesitate to pass judgement on team players that do not contribute to the
ultimate goals.

Das and Teng (2001) consider that social control influences people’s behaviour through creating
shared goals and Values. This process increases mutual understanding, and it is thus trust-breeding.

But can trust be based on social controls and output controls? In practice the argued goal congruence
within partnerships is not clear and recognised. As a result, behaviour is not focussed on the project-
goals but on short term success. When contracts shift towards more goal congruence, both parties
will likely be more interested in the results of output controls as both will have to realise preset
goals. The author’s direct experience suggests that trust can not be based on social controls alone.
Positive results on output controls do however increase trust.

Thirdly, it should be clarified if social controls are or can be substitutes for behavioural controls, and
what role play third parties in this relationship.

Social controls are probably the best controls to realise a project, although this depends on the
relationship between the people involved. Two out of three RWS contracts do rely on behavioural
controls to manage the contractor. These controls are often specified in detail and leave only little
room for interpretation. This might be inefficient, but is also contrary to the market philosophy stated
by RWS in the agenda 2012. This philosophy gears up to a more productive way of cooperation
between RWS and contractors. In this there should be more room for social controls, than based on
more shared goals, and less behavioural controls.

Interestingly, the most diverging goal between contractor and principal in both short term and long
term contracts is the financial one: contractors want to maximize profit and secure long term return
on investments whereas the principal would be better off when contractors achieve the opposite
result. Therefore, contractors need to make a good profit on projects and are keen on receiving extra
orders. Nevertheless, DBFM contracts also involve converging goals between contractors and
principal. Table 1 summarizes and compares intrinsic goal congruence between DBFM contract and
short term contract.

<table>
<thead>
<tr>
<th>Table 1: Goal congruence comparison between DBFM and DB contracts</th>
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<tbody>
<tr>
<td>Goals</td>
</tr>
<tr>
<td>Delivery date</td>
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<tr>
<td>Contractors Profit</td>
</tr>
<tr>
<td>Optimise Life cycle costs</td>
</tr>
<tr>
<td>--------------------------</td>
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<tr>
<td>Availability of service</td>
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<tr>
<td>Quality assurance</td>
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</tbody>
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Legend:
- Green: goal congruence between Contractor and Principal;
- Medium: indifference attitude towards goal;
- Red: diverging goals between Contractor and Principal.

Third parties can be helpful to execute the controls that result from the contracts obligations standpoint. They are helpful in preventing arguments over contract details and execution, and thus fostering a better relationship. As a result, whenever social controls play an important role, it might be very helpful to use a third party to audit the processes leading to the outcome and play the role a referee plays in football.

### 3.3 Data collection

Three different typical contracts have been investigated. The contracts are referred to as Contract A, B and C.

Contract A is a contract for the design, build, finance and maintenance of a large and relatively complicated Tunnel, the second “Coentunnel”. This project is multidisciplinary, therefore the contract itself has detailed technical specifications as well as a description of the performance measurement system, on which financial payments are based.

Contract B is related to a somewhat less complicated work, the design, building, financing and maintenance of a new motorway in the North of Holland. It is less detailed in technical specification and the functional outcome is the main focus of the requirements.

Contract C is a relatively small contract for the design, building and maintenance of a radar and communication system for the Amsterdam Harbour, a so called Vessel traffic system. This contract uses the ‘standard’ AV GC contract models, but the technical specifications are detailed and consist of numerous appendices. These appendices where not part of this study because? (please give a justification).

The selection is therefore based on 3 recent contracts that include a maintenance component. This was done as these contract types are in theory most suitable for an incomplete contract. When the contractor’s performance is poor, he will be confronted with problems during the maintenance period. These types of contracts involve the strong post-completion warranty, and in theory there is no need to specify them to detail since they have this self-enforcing component. The longterm relationship is another factor that makes these contract types perfectly suitable to propel the new market strategy with is room for partnership and trust.

The direct data collection from actual content was validated with data collected from a questionnaire that was send to a selection of 10 contract managers. Eight contract managers returned the questionnaire. The contract managers had been selected based on their experience with the contracts of study and on their experience with new contract types with UAV-GC integrated contract forms (Design and Build, sometimes Maintain).

The empirical analysis of contracts content is based on data and observations collected in several steps:
3.3.1 Step 1: Categorize and quantify the relative frequency of contract requirement types

The following categorization is used:

- **Category 1a: Outcome (functional) requirements**
  Includes requirements that prescribe:
  - 13a) the desired outcome;
  - 13b) the desired functions;
  - 13c) data for milestones;
  - 13d) financial payments.

  This category includes all requirements that refer and contribute to the function and use of the infrastructure product. Take for instance a tunnel, an example of such clause is the following: “... tunnel tubes must be equipped with a speed detection system to signal slow runners and ‘speed discrimination’ from the traffic operation location.”

- **Category 1b: Outcome (technical) requirements**
  Includes technical requirements that are 'input based'.

  This category includes all requirements containing detailed technical information. For example with a tunnel, a clause on the emergency lighting might require: “... distance between emergency lights needs to be 12.5 meters from centre to centre.”

- **Category 2: Laws and standards requirements**
  Includes requirements that prescribe:
  - 2a) the use of laws
  - 2b) general processes or standards or
  - 2c) what was derived from such provisions

  As an example the following clause: “When conflicts in documents arise between document(s) of the (?) contractor and other parts of this agreement (from principal) the other parts will prevail.”

- **Category 3: Process requirements**
  Includes process requirements that specify the contractor how to:
  - 31a) Design
  - 31b) Build
  - 31c) Organise
  - 31d) Maintain
  - 31e) Audit
  - 31f) Verify
  - 31g) Manage

  This category includes all clauses that refer to the way the contractor should manage the process. For example: “The management system must be written down in the management plan, that should comply to ISO/IEC 15288 or ISO 9001.” Another example is: “The contractor is responsible for possible safety and health plans for subcontractors and suppliers. He must be able to present his verifications and tests.”

- **Category 4: Miscellaneous requirements**
  This residual category includes all requirements not possible to be classified under 1, 2, 3 or 4.

  For example the following clause: ”... replaceable parts should be visually inspectable without means of help.” As in this case the contractor is responsible for inspection and service there seems to be no need for this requirement.

Based on data obtained from categorised contract clauses, the hypothesis that mistrust (as expressed in the relative use of input based requirement clauses versus desired outcome clauses) is the driver of additional contract complexity can be examined.
When the categorisation and quantification of requirements has been finalized, the findings from step 1, regarding the relative weight given to process requirements in contracts, can be further tested and validated by contract writers and managers via a directly administrated questionnaire.

Contract managers are asked to rank, in terms of relative importance (in decreasing importance on a scale from 1 to 8) the following parameters of contract execution:

- Time
- Money
- Quality (outcome)
- Quality during execution
- Explicit and verifiable working process
- Verifiable working (?operation ?work) as per process requirements
- Cooperation
- Safety at building space (?construction area)

3.3.2 Step 2: Validation questionnaires filled out by contract managers

The contract managers have been asked to qualify each of the following statements as true, neutral or false:

1. Process requirements force contractors to deliver a good result
2. A contractor that respects the RWS process standards delivers a good result
3. Contracts that do specify detailed technical requirements lead to good results
4. Only contracts specified up to functions have led to better solutions
5. Systems engineering leads to better solutions
6. Systems engineering (to functions) will save money
7. The obligation to follow the contractors own quality system has lead to better results
8. Only the obligation to follow the specified quality system will lead to better results
9. A contract can never be executed in full detail: there need to be room for interpretation
10. Contractors do the utmost to realize principal goals concerning time, money and quality
11. Contractors main goal is to realize his own financial targets
12. Contractors are only interested in principals goals as a financial incentive is involved
13. Incomplete contracts will almost certainly NOT lead to contractor claims as result of a possible room for interpretations
14. Contractors are very concerned about the contractor-principal relationship
15. RWS contracts are over-complete and specified to unnecessary detail
16. RWS contracts are smart and efficient
17. RWS contracts lack process requirements
18. Some Process requirements can easily be left out as they are never executed
19. RWS is capable to judge the contractors results
20. Cooperation on a trustworthy base will lead to a better realisations of goals
21. Principal goals are a fixed item on regular project meetings
22. With some more trust and reliance in the market, projects would be executed more efficient

3.3.3 Step 3: Finding out how the contract is actually enforced

Given that written clauses might be practically irrelevant, discarded, and not actually used, it is also important to learn more about the way behaviour controls do really matter in the execution of contracts. This is the objective of Step 3.

Most contract managers believe that once a project starts other commitments and risks of the contractors will distract them from focusing on the content of the contract.

Therefore it is useful to observe how strictly contracts are enforced if this widely held belief turns out to be an actual threat. Evaluation reports, contract change on this subject etc. can be good and
helpful instruments here. Maybe a simple review of some topics can also be of use. The aim is to determine whether contract managers argue with contractors about the main objectives of the contract or whether contract meetings are used to argue about items and risks that are not of main importance for the realization of essential contract goals.

Data can be collected from weekly reports with the main risks identified in order to count the amount of attention that has been given to any risk. Analysis of the reports may reveal how contracts are used and enforced:

- Do contracts reflect and cover the most dominant risks identified?
- Is management information based on parameters within the contract (for example work breakdown structure elements?)
- On what (other) source of data is management information based?
- What are the main issues discussed in project meetings?
- Are contract incentives (bonus/fee) executed?
- Are all process requirements (data scheduled, reports prescribed, etc.) strictly followed?

The prior belief here is that behavioural controls distract focus from the results that matter and are instead directed, primarily and frequently, on details.

Based on the observations and analyses done in previous steps, it is possible to evaluate whether the behavioural controls provided for in contracts are perceived as necessary, in this type of contract, in order to achieve more efficient inter-firm relationships and to lead to the desired outcomes.
4 Results

4.1 Step 1: Analysing based on categorization of clauses in Public Work contracts

4.1.1 Descriptive statistics on contract requirements

Contract requirements

The three contracts mentioned in the previous section have been examined in detail. The requirements were divided into different groups. The aim of this classification was to gain more insights in the way these contracts were designed. Are the requirements related to some form of mistrust or are they essential to secure the outcome desired?

The perspective from which the classification was made is that since contractors are selected after a prequalification, in which they should show their ability to handle large infrastructure projects, it proves their capability in (accessing) technical design and building knowledge. In short: contractors are qualified for the job.

The contract requirements are divided into four categories:

- Category 1a and 1b: Outcome requirements, i.e. requirements that prescribe the desired outcome in functions, and the basic set of agreements, thus considered as essential.
- Category 2: Technical requirements that are input based, and in fact are a limitation to the contractors design possibilities. These requirements are considered to be a result of mistrust, as they are intended for a part of or for complete systems that can very well be designed and engineered by the contractor.
- Category 3: Process requirements, i.e. those that prescribe how the contractor should organise his work, how to interact with involved parties or how to verify his results. Such requirements might be an over-specification related to mistrust.
- Category 4: Miscellaneous requirements are often related to mistrust like the prescription of laws and standards.
Table 2: Contract requirements: frequency and relative weight given to mistrust-related clauses

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Contract A</th>
<th>Contract B</th>
<th>Contract C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Outcome/(functional)</td>
<td>794</td>
<td>34%</td>
<td>158</td>
</tr>
<tr>
<td>Input (technical)</td>
<td>792</td>
<td>35%</td>
<td>79</td>
</tr>
<tr>
<td>Process</td>
<td>384</td>
<td>17%</td>
<td>149</td>
</tr>
<tr>
<td>Laws/standards</td>
<td>321</td>
<td>14%</td>
<td>112</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2291</td>
<td></td>
<td>498</td>
</tr>
</tbody>
</table>

Table 3: Frequency and relative use of contract requirements that could be related to mistrust in contractors

<table>
<thead>
<tr>
<th>Requirement (%)</th>
<th>Contract A</th>
<th>Contract B</th>
<th>Contract C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necessary</td>
<td>48%</td>
<td>54%</td>
<td>52%</td>
</tr>
<tr>
<td>Mistrust related</td>
<td>52%</td>
<td>46%</td>
<td>48%</td>
</tr>
</tbody>
</table>

Table 1 and 2 based on a survey of 3 contracts.

4.1.2 Results of contract requirements analysis

First I selected 3 different contracts\(^3\), referred to as contract A, B and C and divided the requirements. Then data on frequency and relative use of each category was collected.

As can be seen from Table 2 presented in the previous section and from Figure 2 below, in all 3 contracts about 50% of the requirements are not strictly essential in having the contractor deliver the desired outcome. Instead, these requirements show detailed information on how the contractor should be organised, and on how he should design or manage the project.

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\(^3\) Contract A: a DBFM contract for an infrastructure Tunnel, B a DBFM contract for a new motorway, C a DBM contract for a Radar/Vessel Tracking System.
The results point to several remarkable findings:

For **contract A**, which seems a fairly complete contract, it is remarkable that there are many requirements that prescribe technical solutions by defining a technical scope instead of the functions needed.

There seems to be little faith in the contractor, as technical solutions that the principal had in mind are often specified in detail in this contract.

An example of over-specification found in this contract is the exact specification of an emergency-locker. These lockers are positioned beside the road, in a tunnel, and consist of a fire extinguisher, a telecom connection and other safety equipment. This is a fairly minor part, yet critical when needed, but not specifically critical for the primary function of the foreseen infrastructure. The contract further specifies extensively: all RAL colours of the locker, the door, the background, the extinguisher hinges and the extinguisher handheld. Then the minimum size of the written instructions is given in mm and the exact instruction is specified. Also the positioning height for the extinguisher and telephone are prescribed at 1.60 meter, to prevent the contractor from constructing a security device difficult to reach for by human beings’. Although RWS leaves it to the market, there is obviously no faith in the contractor’s ability to construct an usable emergency locker that meets the necessary functionality requirements. Also, the tendency for completeness in this contract is shown by the exact figures for the amount of water the road should be able to absorb in case of heavy rain. Though the main goal is that the road should be safe to drive on, without standing water which presents the risk for aquaplaning. This can be seen as a way of quantifying and imposing smart requirements, on the other hand it can also be seen as an over specification.
For contract B the most obvious difference in comparison with contract A is that it has far less requirements. Specifically it has few technical requirements. The specified outcome is partly integrated with requirements I considered financial as they relate performance with financial results. The specified function itself leaves room for optimization by the contractor, although contractor has to meet the concession as agreed upon after political agreement. So we can consider this contract as ‘incomplete’ for the technical specs. Process specifications are just as complete as for contract A, and can be regarded as more complete.

Contract C also appears to be a complete contract: it is not an actual PPP contract, but maintenance and availability over a 10 year period are an integral part of the contract. It is a project for a radar system guiding ships to enter the Amsterdam harbour safely. The radar system will monitor the movements of each ship and facilitate a quick and reliable sailing time with less interruptions at the lock doors in seaport IJmuiden. As a result of the chosen contract form the contractor is responsible for quality, and therefore there would be no need to prescribe his process in detail. The contract demands are functional, although some functions do refer to detailed technical specifications and can be considered as functional, but they are overly complete too.

Relevant to questions regarding trust is also the issue of non-contractual warranties, which are embedded in the way the selection of contractors is achieved. RWS uses an advanced set of pre-qualification requirements. Turnover, experience on execution of certain projects based on the project budgets, or skills on technical or specific design issues is the first step in creating trust and confidence.

The next step is the quality management plan, in which a contract bidder must show his capability and specify his solution for some preset problems. This plan is rated by a commission and is also introduced to reduce the risks of contracting an incapable contractor.

Then there is a financial measure: requesting a statement from a Dutch Bank (Bank warranty) must secure the financial situation of contractors.

Related to trust in contracts the following is worth mentioning:
- although goals like deadlines and amount due are included in the primary contract documents, other goals like traffic management, trust in the management process of the contractor, systems engineering (as a traceable way of designing) and image building are not specified in the primary part.
- A form of balanced scorecard, with main goals for every role of the IPM model and for the contractor was not included in the 3 contracts, although it could have been helpful in measuring the amount of trust a contractor gained over the project.

4.1.3 What factors might explain contracts’ completeness?

Can it be concluded from the finding of the contract requirements analysis that Mistrust is the driving factor of contracts’ completeness? Contract C, for example, uses a fairly complete standard process specification, but contract writers for this contract added about 30% (estimated) additional requirements.

Process controls can also be seen as substitutes for trust. Next to the technical specifications there are abundant process requirements. In contract A and B though, a fair part of the process requirements are left to the contractor. But nevertheless these process requirements, partly specified by the contractor in his management specifications, are part of the contract. RWS will audit the contractors work by following his own process as specified.

The research question on whether mistrust is the driver of all this additional contract complexity can not be fully answered on findings in the contract alone, since there might be other factors that
determine setting of detailed technical requirements. However, based on the observed detailed specifications on minor issues it looks likely that mistrust is a prominent factor here.

Nevertheless, based on the findings from the categorisation of requirements several ‘drivers’ for complete contracts can be assumed:

- Technical experience accumulated by principal: the issue mentioned for contract A above, where detailed specifications were given for a minor and not difficult part, seems illustrative for the problem the RWS organisation faces. Solutions and experience that have been gained over a period of many years can not be easily transposed to the market by a functionally specified contract.

- Internal communication issues: Contracts are usually written by experts in several disciplines. Technicians write the technical specification (VS1) (outcome or function) whereas financial and juridical staff prepare the process requirements (VS2). When asking contract writers for some details I learned that technical staff, who are responsible for technical specifications, have little faith in the process requirements in the contract. As a result some detailed specifications end up in the contract to prevent opportunistic behaviour of contractors. On the other hand in the process requirements there are other measures foreseen to prevent opportunistic behaviour, as the contractor should verify his solutions to the demands set. A possible cause of over-complete contracts may be a result of insufficient knowledge of the complete contract by contract writers. This could be interesting for further investigation within the RWS organisation.

- Legitimization issues related to public task and responsibility: For process requirements the conclusion can not be based on findings on the contract specifications per se. Although the wish to specify the management process in the contract can be seen as some form of mistrust that leads to specifications, because if the principal had full trust in the management process and capability of the contractor he would not have specified this process. An alternative explanation however can be found in the wish of Rijkswaterstaat to be seen as committed and informed to fulfil its public tasks and responsibility.

The information collected in the next step of this research will help answering the questions above, as the meaning of the findings will be verified to the views and perceptions of contract managers on the underlying drivers of contract completeness.
4.2 Step 2: Analysis of contract managers motivation driving the content of contracts

4.2.1 Mistrust

My prior belief is that complete contracts are evidence of low levels of trust in contractors which compel managers and contract writers to focus on process instead of goals and results. Mistrust is a term used interchangeably with the terms “perceived performance risk” and “relational risk”. The concept of Mistrust has been operationalized as the sum of any requirement stated in a contract which prescribes the way the desired outcome is to be achieved, and which, on its own, does not lead to the desired outcome.

There seems to be not only limited trust in the capability’s of the market but there also seems to be little confidence in the attitude of contractors. Although a variety of reasons has been named, contract managers stated the following arguments and reasons for drawing over-complete contracts:

1. A complete contract is not wrong: it takes more time to write it, but one improves the probability that the desired solution is attained;
2. Should be used to impose the design of proven and solid solutions;
3. Former negative experiences (technical, financial or legal disputes with contractors);
4. RWS finds itself /is held responsible for the infrastructure availability despite passing this contractual risk on to contractors ;
5. Lack of experience/expertise with functional specifications;
6. Process controls must be used to compensate for the lack of technical know-how;
7. Consultants may have an incentive to create difficult problems with difficult solutions, as they get paid on an hourly basis;
8. Legal and other public parties require detailed solutions;
9. RWS has struggled over accountability and controllability with internal financial auditors over the past decade;

Justifications like 1), 2), 3) and 4) do point toward a mistrust in contractor expertise or goodwill, but all other explanations provided by contract writers reveal that issues unrelated to trust might also be responsible for an input or process requirement over specification. They indicate that the change of policy regarding PPP contracts has not been accompanied by institutional changes that would support actual application of the new policy: consultants’ incentives are the same as before, the training for a new set of skills has been neglected; the system of accountability and audit went unmodified.

Without an alignment of incentive and accountability system, it is only reasonable that contract writers and contract managers would not alter their behaviour and underlying belief system.
4.2.2 Could more trust be an alternative?

In interviews held with RWS contract managers there seems to be no consensus about the use and effects of process requirements in contracts. Although there are benefits expected for any contractor working by his own quality system there is no consensus whether this has led to better products. However there is a strong consensus about the attitude of contractors: their main goal is profit maximization, and there seems to be little respect for goals set by the principal if there is no financial punishment involved.

I received quite remarkable answers from contract writers and managers to questions about the optimum level of trust. Their answers were unanimous that when working together, based on trust, this would lead to a better realisation of the goals set. The answers also indicate that when there would be more trust in the market capabilities all ‘would work out better’. Nevertheless, the same contract managers also stipulate that from experience, contractors do not hesitate to claim extra money when small loopholes (unclear requirements in contracts) allow them to do so. There is consensus among contract managers that RWS contracts are too complex and specified in too much detail. Contract managers state that these details do not contribute to the achieving of higher quality output.

Although this sample opinion survey is likely not representative for all contract managers, it still indicates that as a group contract managers do believe in the expertise of their contractors. On the other hand they are well aware that for most contractors the goal of making a profit is more important then the principal’s interest and their relation.

Contract managers unanimously believed that a very rigid / over specified contract is impossible to manage: there is a need for a little margin to execute it. They are also unanimous that working in strict conformity with the specified process requirements is less important to them. Safety is considered the most important attribute of the project.

These interviews also revealed that contract managers do rely on the management, audit and verification system of their contractors. Only risks that are defined as highly material, i.e. as the product of probability of occurrence and financial consequence, stipulated in financial terms above a million euro, are set to be monitored and audited in detail. As a result, the inconsequential detailed requirements, those typically ‘over’ specified in contracts, are not followed up during the execution of the contract by other parties, but only by the contractor.

4.2.3 Conclusion step 2

My prior belief was that complete contracts show less trust in contractors and are focusing on the process instead of goals and results. To evaluate this opinion proved to be difficult. Based on the findings of this research one can however conclude that at RWS there is a strong relation between the degree of trust and contract completeness. As a result of mistrust in the behaviour of contractors, there is a strong motivation to specify contracts deeply. This leads to detailed process requirements in the contract, to detailed technical specifications as well as to a strong selection process.

Interviews with contract managers gave strong indications that the following statements hold truth:

- Contracts are indeed often over-complete, but contract managers indicated that many technical or process details are not of major importance to them. This lack of importance is also supported by the way contracts are enforced;
- Contract managers do believe in the ability of their contractors to deliver good solutions, but expect them to behave opportunistic, if given the chance;

- Most contractors are believed not to be really interested in trust or principals relationship, as most of them use each possibility to claim extra money or time;

- Contracts do have only limited goal congruence, and even for PPP contracts the theoretical advantage in keeping the contractor responsible for his own life cycle costs does not always lead to the desired outcome. The reason for this is most probably the new role of the funding company, which is in effect the party confronted with malfunctions;

- The most important factors from contract managers point of view, safety, time and budget, are the ones least specified in the contract.

4.3 Step 3: How the contract is actually enforced: the execution of contracts

My prior belief is that behavioural controls distract focus on the results that matter and are often focussed on details primarily.

4.3.1 Contract management: system based contract management

This type of contracts is managed at RWS by using a mix of audits, dedicated to various risks. This is called “systeemgerichte contract beheersing (SCB)”, i.e. system based contract management. The system is based on the management system that the contractor operates. The underlying assumption of this management system is that the contractor verifies and audits his own processes and results. When the contractors systems operates well there will be Deming’s ‘Plan -> Do -> Check -> Act cycle’ a quality improvement spiral for improving processes. RWS defines a contract management plan and thorough risk management processes or products are audited by RWS.

This method of contract management is only possible when there is a lot of trust in the contractor, as results and payments are primarily based on paperwork from the contractor. In fact for bigger PPP contracts the audit materiality limit is well over 1 million euro. This means that only processes or products that have a determined risk above this value will be verified or audited. Other processes will not be checked, beside a simple verification whether a product is delivered but without checking the quality.

So the question arises up why technical requirements are specified in such detailed manner in contracts while during the execution of the contract these details are not checked by the principal at all. The explanation for this is believed to be that the contractor will use his own verification process, one which he has checked and has proved that the design complies with the requirements set or deducted from the contract and that the build meets the specifications as designed.

With the simple tunnel safety locker mentioned previously the detailed requirements will become part of the specification and the design. The contractor should prove that his design meets the specifications and the requirements by verifying the design. After the locker has been build, the contractor should also report that the locker meets the specifications by a validation test and report. In theory when the reports from the contractor and his systems are reliable the eventually build locker will meet the requirements, or if not the contractors quality process should have informed the principal.

Thus, for a simple object one of the most critical processes is the verification process of the contractor. When it is reliable and the information it produced is complete there is no need to check
these details again fully. Although this sounds sensible in theory, circumstances are not always in favour of the system.

4.3.2 Focus on Time, Budget and Availability

While the SCB process is used to manage the contract the real focus seems to be on other items: the monthly ‘progress reports’, which are considered a good check point for the real issues concerning contract execution.

Although the contract can be over specified, during the execution of the contract the principals seem no longer interested in these details. The main goals are leading issues: contract data, budget and availability of infrastructure during the building process and prevention of traffic jams.

This finding raises the question whether there is a real goal congruence over the project goals for both parties. Are their respective goals visible and known and how can both contractor and principal be supportive in realising both sides their goals? This appears to be an issue to uncover by further, in-depth research.

4.3.3 Principal remains fully accountable for assets

During the interviews, contract managers have been asked to clarify the role of the principal in contracting and to evaluate both his legal and political responsibility for the assets resulting from an infrastructure project. The degree of accountability over the project result could well be an important reason for Rijkswaterstaat contract managers’ reluctance to leave infrastructure products to the market designs, with only limited influence on the technical solutions offered by the market. There is fear that malfunction of privately build constructions will finally reflect on the principals organisation, instead of being seen as being the contractor’s responsibility.

This reason needs further investigation from a social and political science perspective.

4.3.4 Conclusions of Step 3

One question was how contracts are actually enforced during their execution. Do contracts reflect and cover the most important risks identified by contract managers? Contracts do cover the most important technical, design and legal risks. As risk management is the basis for most projects there is a strong tendency to reduce the risk for a principal and transfer it to the contractor. Mistrust in the contractors processes and abilities leads to process requirements. However the main concerns or risks are safety and time. These items are not specified in depth in the contracts of study. The ultimate delivery time is of course included in the contract, but realising this date is mainly left to the contractor.

According to the theory of System based contract management, as campaigned by RWS, audit processes on the execution of contracts are essential. Nevertheless the focus during execution should be on the most important risks. Still it is not clear whether in practice the risk management process is always reflecting the different risks, as this is very much depending on the background of the people involved. It could therefore be helpful to approach contract management risks from the following different perspectives:

- A: Technical risks affecting the availability/usability/durability of the good
- B: Environmental risks
- C: Safety risks
- D: Time
- E: Budgetary risks
This approach could allow someone to play the ‘opportunistic contractor, looking only for his margin’ within the process of risk identification, but it has only rarely been used over the last years at RWS.

As a result we may conclude from the conducted interviews with managers on contract execution and the enforcement process as follows:

Q: Is management information based on the parameters specified in the contract (e.g. work breakdown structure elements, etc.)?
A: No management information is usually related to budget, safety and time.

Q: What are the main issues discussed in project meetings?
A: Main issues are contract changes, claims over extra costs and external influence on scope. Sometimes time is allocated to technical solutions as well as legal issues.

Q: Are contract incentives/disincentives (bonuses/fines) actually used?
A: The contracts investigated lead to fines, but much less to bonuses. In case of some contracts, there is a tendency to use fines as a mean of putting pressure on the contractor, but seldom these fines are really executes.

Q: Are all process requirements (data scheduled, reports prescribed, etc.) strictly followed?
A: No, not all are followed because, as contract managers suggest, this is not their main concern.

Q: Are all technical requirements necessary?
A: No, because audits on quality assurance systems do follow design processes and there is only limited interest in detailed requirements. Most contract managers interviewed believe that 50% of technical specifications are over-complete.

Given these findings, it is even more remarkable that so much effort is put in writing a detailed contract, while during the execution the contract is not strictly followed and technical details are not monitored by the principal. It is precisely on these detailed specifications that the contractor will monitor the demands and verify the results himself. More trust in the contractors on these items would ensure a much less complete contract with only very limited increase in risk.

Interviews with Contract managers involved indicate that their main concern is not whether contracts are followed up on in detail but that the project is realised within time and without major accidents or negative public opinion as a result (for example, traffic jams). Although their main concerns stated are safety and time. Requirements related to these items are not specified in depth in the contracts investigated. The ultimate delivery deadline is indeed a clause in the contract, but the setting of intermediate milestones for this date is left to the contractor.

As a result it is fair to suggest that my prior believe is not thorough, as contract managers do focus on their prime goals. It makes also clear that a lot of the detailed specifications are no issue any more during contract execution, as they are seldom monitored. The question why so much effort is put in these details seems essential for RWS’ agenda 2012.
5 Conclusions

It appears that complex infrastructure contracts are written from a perception of mistrust in the ability and willingness of contractors to deliver a good technical and financial outcome. As a result, these contracts consist of a large number of clauses related to behavioural controls.

From both a theoretical and practical point of view, it would be useful to determine whether there could be a prominent role for trust in complex public work contracts and whether more trust would ultimately lead to better performances. Such an experiment has been attempted at RWS, with little apparent success.

The objective of this thesis was to find out whether more trust would indeed prevent contract writers to create even larger and more complex contracts. Will trust ever replace formal controls or are the latter better to manage a contract? To answer such questions, the actual factors that determine how contracts are written and enforced, have been investigated.

5.1 What factors drive contracts to completeness?

The conclusion of this analysis is that mistrust is probably the single most important factor behind the writing of complete contracts, as about 50% of the requirements are not essential for the contract or the desired function. Therefore they can all be related to some form of mistrust. These requirements are about holding a firm grip on working processes, the design and chosen technical solutions, which were in fact supposed to be entrusted to contractors.

The other factors that account for complete contracts are:
- the fact that there is no real sanction to write a complete contract,
- the process orientated contract management,
- standardisation of technical standards and the fear of malfunction if only output based requirements are specified, whilst RWS has gained a lot of experience with proven technology.

5.2 Will more trust lead to less complete contracts in infrastructure projects?

While searching for an answer to this question, several interesting findings have been revealed.

Firstly there are some big infrastructure projects marketed as a DBFM contract, (true PPP), but most of the infrastructure contracts in public work remain simple Design Construct procurement contracts, some including a Maintenance component.

Secondly these PPP contracts rely on the expertise of contractors, and the financial mechanism that contributes to their quality (build) and performance during the maintenance phase.

Thirdly, apart from the expertise and financial strongholds, RWS has specified a strong process management grip in the contract to make sure that the contractor can verify design and the final result.

Fourthly, although there seems to be a strong policy in agenda 2012 toward shifting risks and design to the private sector, there is still a tendency to specify technical solutions instead of the needed functionalities. As a result of 3 and 4 there is a large effort/cost incurred to specify a contract and to put it on the market. Contractors also face high transaction costs on these contracts, because of the need to confirm to process requirements and design methods.
Although by these contracts the contractor is responsible for the correct functioning of the infrastructure, there still is a strong accountability felt within the RWS organisation for the case of malfunctions, as public opinion sees no difference in contracts and points the finger at RWS as infrastructure supplier.

Thus, despite the long-term commitment to switching to a market philosophy, at RWS the actual contracts not yet reflect this new policy. Contracts preserve the tendency to be very complete and still do not reflect the trust that is campaigned in the business plan ‘Agenda 2012’.

What do we learn from the way RWS has tried to shift contracts from input to performance-based contracts in PPP?

If trust would play a more prominent role in the contract design (i.e. result in less complete contracting), this might well lead to a better performance during the execution of the contract and even a better product at less cost. If specifications and process controls would not be so comprehensive, most detail would be the craftsmanship of the contractor, and the technical solutions which might be created could be more efficient.

To really leave things open for contractors though needs another focus within contract teams, not only time and money should be a prominent factor, also improving the goals and durability of the solutions, (Life cycle approach) should be a prominent key performance indicator. Controls by the principal should focus on project risks but also on identified cost drivers, safety, environment and durability. A more prominent role for goal congruence in contracts might be an essential step to achieve the desired close cooperation between contractors and RWS.

5.3 Do complete contracts reduce transaction costs or reduce risk?

The results found in this research do not fully clarify this question. However, neither has the author found evidence opposing the following believes:

- The investigated complete contracts, both outcome based but also detailed to solutions and process, do not reduce transaction costs for both parties, but do reduce risks for the principal;
- Leaner contracts, which focus on the function and the main results, are likely to reduce transaction costs. These do increase risk but only risks concerning minor details, that have proven not to be an item during the execution of the contract;
- Social controls play no major role in the reviewed contracts, trust is mostly based on behavioural controls;
- Complete contracts are not executed or fully enforced. There is always room for optimization and there is no in depth outcome control, as this is left to the contractor within the boundaries of his verification and validation process;
- Contract writers are risk avoiding: as a result contracts are specified in detail to prevent opportunistic behaviour from contractors. Some clauses are due to inertia. There is no direct penalty for a complete contract, it takes more time to create, but it also reduces risks for people involved. From a management view there could be a different perspective, as ‘complete’ contracts might well interfere with supposed cooperation between contractors and principals.
5.4 Limitations and Recommendations for further research

This investigation is limited to three contracts conceived by one single agency of the Dutch government: Rijkswaterstaat. Further investigation within other sectors may lead to other results or insights.

The effects on social behaviour and personal contacts can play a major role in contract execution, trust and cooperation. This, together with the effect on the type of contract (completeness), seems a relevant avenue for further investigation.

The rational choice between complete contracts and incomplete contracts from a management point of view seems uncertain, therefore a further exploration of this aspect could be relevant to many organisations.
References

6. Nick Sciulli, Victoria University, Australia, 2007 Public Private Partnerships: Identifying Practical Issues for an Accounting Research Agenda,
8. Douglass C. North, ‘The new institutional economics and development’ Washington University, St Louis
**Annex A: contents of a typical design and construct contract model.**

For example, a standard used for these more integrated contract forms (design, construct, eventually maintain) is UAV GC 2005. The UAV GC 2005 contains a set of regulations and standards that have been agreed between both contractors and public principals. As a result any infrastructure contract, written by Rijkswaterstaat and referring to the UAV GC, consists of:

A. Documents for selection and tender:
   - **Selection document**
     When a pre-selection is deemed necessary the terms and demands regarding experience and know-how are given in this document. Only the potential contractors (“Contractors”) that fulfil the requirements established in this document pre-qualify for entering the tender process. A pre-selection usually limits the number of Contractors in the tendering process to 5, as to minimize transaction costs. A lottery is sometimes used in case there are too many Contractors that qualify.
   - **Tender document**
     In this document is specified how the bids will be judged and ranked, and how the offer should be presented. This document also contains the details of the tender process.

B. Contract documents
   - **General letter of understanding**
     This document contains the most important set of agreements, like delivery time, price, and penalties.
   - ** Annexes**
     In these documents the supplementary contract details are provided.
   - **Specifications 1**
     In this document the technical and functional demands are specified. This is usually a tailored set of demands, for a specific project.
   - **Specifications 2**
     In this document all process demands are noted. It usually prescribes the way the contractor should:
     - manage the contract,
     - assure and audit the quality,
     - manage the environment,
     - design and verify the design,
     - verify and test the results,
     - set a financial payment,
     - inform the principal.

From the contracts can be derived a major part of the total requirements, it is now based on processes from “Vraagspecificatie 2”:
- Management plan,
- Various process plans
- Safety and health plan,
- Traffic plan,
- Communication plan to principal,
- Work breakdown structure
- Legal register,
- Environment plan
- Design:
- Verification plan, design philosophy, verification report,
Validation, testing plan, survey and approval plan,
Audit plan, audit result,
Integral management
Procurement plan,
Financial schedule.

- Contractors offers/bid
  This document specifies the following:
  - price,
  - offered quality as demanded in the tender documents on quality build and processes.
  - usually a more or less complete project management plan.
**Annex B Questionnaire for contract managers and their answers**

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<thead>
<tr>
<th>Process requirements force contractors to deliver a good result</th>
<th>true</th>
<th>neutral</th>
<th>false</th>
</tr>
</thead>
<tbody>
<tr>
<td>A contractor that conforms to RWS process standards delivers a good result</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Contracts that do specify technical requirements to detail lead to good results</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Contracts that are specified to functions only have led to better solutions</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Systems engineering leads to better solutions</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Systems engineering (to functions) will safe money</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>The obligation to follow the contractors own quality system has lead to better results</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>The obligation to follow the contractors own quality system will lead to better results</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>A contract can never be executed to the full details: there is some room for interpretation</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Contractors do the utmost to realise principals' goals concerning time, money and quality,</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Contractors main goal is to realise his own financial targets</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Contractors are only interested in principals goals as a financial incentive is involved</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Incomplete contracts will almost certainly NOT lead to contractors claims as result of a possible room for interpretations</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

| Contractors are very concerned about the contractor-principal relationship | 4    | 3       |       |
| RWS contracts are over-complete and specified to unnecessary detail. | 6    | 1       |       |
| RWS contracts are smart and efficient | 4    | 3       |       |
| RWS contracts lack process requirements | 1    | 6       |       |
| Some Process requirements can easy be left out, as they are never executed | 5    | 1       | 1     |
| RWS is very well capable to judge the contractors results | 2    | 3       | 2     |
| Cooperation on a trustworthy base will lead to a better realisations of goals | 5    | 2       |       |
| Principals goals are a fixed item on regular project meetings. | 1    | 3       | 3     |
| With some more trust and reliance in the market project would be executed more efficient | 4    | 3       |       |

Finally: please rank / score the parameters underneath considering a project:
1 most important, 8 least important

<table>
<thead>
<tr>
<th>Time</th>
<th>3</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Quality (result)</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Quality during execution</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Explicit and verifiable working process</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Verifiable working as per process requirements</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Cooperation</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Safety at building area</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

(one contractmanager did not fill)