

Chapter One

Introduction

1.1 Introduction

This year marks the 10th anniversary of Sir John Egan's report "Rethinking Construction". During a speech in May he stated "In summary, I guess if I were giving marks out of 10 after 10 years I'd probably only give the industry about 4 out of 10 and that's basically for trying". He continues by saying "I have to say that I would introduce, as early as possible in every possible project, a gain share between the client and the industry, with a target based upon an agreed set of parameters, plus or minus I would say 15%" (Egan 2008). However, Kadefors (2005) describes how this is not a good method for providing the best collaboration. He feels that incentivisation goes against the partnering ethos (Kadefors 2005). Therefore, this dissertation will examine if the use of incentivisation is a precursor to the achievement of successful partnered projects within infrastructure projects in South Wales. Furthermore, examine whether the level that the gain / pain share is set at is significant.

1.2 Aims

The aim of the dissertation is to test the hypothesis, "The use of incentivisation with a gain share of about 15% is a precursor to the achievement of successful infrastructure partnering projects in South Wales".

1.3 Objectives

The above hypothesis has been tested via the following objectives:

1. Briefly defining partnering, incentivisation, motivation and success.
2. Research of secondary data on incentivisation and link where possible to successful or unsuccessful partnering.
3. Examination of secondary research to identify areas where data is scarce and or missing.
4. Development of a questionnaire which addressed the scarce or missing data requirements. Then to identify a population and define a sample which can provide significant data.

5. Analysis of the data received and compare with data obtained from secondary sources.
6. Finally, the hypothesis is addressed and a conclusion reached.

1.4 Summary

The aim of the dissertation will be met by using the data obtained from secondary and primary sources to identify questions which will aid in answering the aim.

These questions include:

- Should incentivisation be used on every project?
- Should the target cost and incentive be set as early as possible?
- Should the incentives be set at 15%?
- Should the incentives be the same for pain share and gain share?
- What makes a project successful?
- What factors are important in an incentive scheme?

These questions were used to direct the research in order to meet the aims and objectives. In order to address the aim of the dissertation it was important to understand what research had been carried out previously on incentivisation and specifically on incentivisation within construction partnering.

The structure of the dissertation is first to define the general areas of research and provide the reader with a clear background to the terms of incentivisation and its application within partnering. Secondly the third chapter sets out the primary research findings and the fourth provides a statistical analysis of this information before the final chapter concludes this research.

Chapter 2

Defining partnering and the use of incentivisation

2.1 Introduction

In order to address the Dissertation aim it is important to examine the research that has built up on incentives. The research focuses on construction and partnering to provide an overall picture of current knowledge from secondary sources on incentives within a construction partnering arrangement. This is important in identifying information gaps in these sources which can then be addressed through primary sources.

2.2 Incentives

Business journals contain plenty of research on performance management. Since the 1980's performance management has been researched more and more. Incentives have played an important role in this research (Busi and Bititci 2006). Incentives are used to motivate personnel to behave in a certain manner or to achieve set targets.

Boone and Kurtz (1992) define motivation as “forces leading to behaviour directed toward the satisfaction of some need”. Motivation has historically used two approaches, the carrot or the stick. Taylor used money as the carrot and sanctions as the stick. When Mayo looked at the Hawthorne experiments he realised that money was not the only motivational tool but he thought that workers would work harder out of gratification if treated well. This however has not been proven (Reis and Pena 2001).

The theories can be divided into two groups. Content theories are concerned with identifying different types of needs whereas process theories are concerned with the mechanisms behind motivation. Maslow in 1943 decided that people were driven by the need for five different groups of needs and introduced the idea of a hierarchy of needs which was important for personal development and motivation (Mullins 1996).

Herzberg's motivation theory found that there were two main factors hygiene or maintenance factors and also motivational factors. Hygiene factors are environmental while motivational factors are linked to the work. Vroom came up with the expectancy theory. He maintains that people will be motivated towards a goal that they value and can see that their effort will result in achieving the goal (Boone and Kurtz 1992).

Finally there is a contingency approach which shows that motivation will depend upon the individual's circumstances and the operating environment (Boone and Kurtz 1992). This brief history of motivational theory shows how complicated motivation of people can be.

Incentives came from this 'carrot and stick' idea (Bresnen and Marshall 2000). Incentives are thought to be one method of motivating people to achieve the desired task (Sappington 1991). Incentives as well as aligning objectives also takes the contractors focus away from short term gain to life cycle costs according to CIRIA (Anon 2001). "An incentive mechanism is a process whereby parties to a contract are rewarded for performance significantly over and above that contracted for, which is of material benefit to the client and can be measured. Incentives may be financial or non-financial or a combination of the two" CIRIA (Anon 2001).

Incentives do not have to be a direct financial reward for work but also includes loans, grants, industrial rates of relief and further work (Reid 1994). Some companies use stock options as an incentive to motivate risk adverse managers, although this method has been questioned (Williams et al 2008).

Incentives work by increasing motivation which encourages the correct behaviour and increases effort (Mohd-Sanusi and Mohd-Iskandar 2007). Performance can only be managed if it is possible to measure it. If it can be measured then it can be improved (Milne 2007). It is important to measure and manage performance if incentives are to work, however this is not carried out as much as it should be (Busi and Bititci 2006). Llewellyn et al (1990) describes how in examining incentives in the health care system, they found that it is important that the incentive structure is aligned to the objective required.

Within the defence industry in the USA they examined the available contract options of firm fixed price contracts and cost-plus-fixed-fee contract. Firm fixed price contracts encouraged the contractor to keep costs down in order to make a profit but do not foster a good relationship. At the other end of the scale the cost-plus-fixed-fee contract does not encourage the contractor to keep costs down as within reason all incurred costs will be repaid. The defence industry felt that a happy medium was needed between the two and so devised cost incentive contracts. It was felt that these contracts were most effective when the target cost was set so a small overrun is anticipated. However, only the contractor is fully able to judge if the target cost is set correctly (Scherer 1964).

There are a few papers that examine how incentives may affect a business relationship. They discuss the relationship in terms of principal and agent (Holmström 1979). The basic idea is that if the agent is given a fixed wage than there is an incentive to not work to the best of their ability because they get paid anyway. If however the agent is only paid a basic rate and to earn more has to achieve certain targets there is an incentive to work harder. It is important however that both the agent and the principal benefits from this arrangement. The incentive aims to make the agent work for the best interest of the project but there is a risk that the agent will work for their own best interest, this is called the moral hazard. When using incentives with groups of people it is further complicated because not all members of the group may be working for the best interest of the project and there may be 'free-rider' problems. Incentive schemes need to consider that rewarding the group as a whole may not be the best possible method (Petersen 1993). However Naoum (2003) discusses how incentives if used correctly can be used to motivate teams to consider time or quality. He goes on to discuss how the correct use of incentives could be used to reflect the clients priorities within the project (Naoum 2003).

As Brumback (2003) states "Only individuals literally perform. It is how well they perform together that makes a championship team possible". Milne (2007) discusses how reward and recognition programmes work very well in motivating individuals but that teams are not so easy to motivate. This appears to be because it is difficult for individuals to see how individual effort results in the group performance. There is also a risk of certain members not pulling their weight

within the group. They also found that it can bring about a competitiveness which goes against the team ethos (Milne 2007).

2.3 Incentives in Construction

Many papers discuss how the construction industry can be improved but managing large groups of people is complex and often requires more than trusting people to do as they have been asked to do (Ronco 1998). The early work on partnering suggested that incentives would be useful in producing a measurable improvement in achievement (Saad et al 2002). CIRIA (Anon 2001) describe how there is little published material on the use of incentives in construction and the writer has discovered that this has not changed much in the intervening years. Egan in rethinking construction 1998 discusses how the benefits of improved construction should be shared amongst everyone not just the client. This hinted at an incentive idea (Egan 1998).

The incentive contracts payment schedule consists of a fixed fee plus some proportion of the predicted project cost. Usually, the higher the sharing ratio used, the larger the incentive to reduce cost. However the client will expect the contractor to take a greater share of the risk as well. Therefore in order to calculate the optimal sharing ratio it is important to consider the uncertainty in the project, risk aversion and the contractor's ability to control costs. Construction is unusual in that the project costs are not known when the contract is being drawn up (Weitzman 1980). It is important that both parties recognize exactly the same possible risks inherent in the project in order to set the incentives correctly. Performance is very hard to judge in construction and so incentives are set on the target cost rather than on the success of the project in terms of quality etc (Sappington 1991). Agency theory looks at the relationship of a principle engaging the services of an agent to achieve a specific task. The theory examines the fact that the objectives of the agent and principle are not the same and the verifying the work of the agent is difficult if not impossible. The theory links these problems to the individuals having different attitudes to risk (Eisenhardt 1989). Risks must be managed if better performance is to be achieved also the register should be used to inform the incentive level (Anon 2001).

Papers such as Shavell (1979) and Badenfelt (2007) use mathematics to calculate the appropriate levels of incentives. The starting point is to calculate the target cost from this the level of pain or gain (incentive) can be set. This would appear to be simple but there is still no method that always works. The level of perceived risk is used to help calculate the level of incentive and this is difficult to value. Traditionally the higher the sharing ratio, the higher the perceived risk involved in the project. Therefore risk adverse contractors will accept a lower sharing ratio. In working out the sharing ratio the client and contractor need to discuss their attitudes to risk, and the probability of achieving the set target cost (Badenfelt 2007). Al-Harbi (1998) came to the conclusion that it is important that the contractor and client come to an agreement together about the value of the pain gain percentage.

The full list provided by Badenfelt (2007) of factors to consider for negotiating a sharing ratio for construction projects in Sweden is as follows:

- “The client’s and perceived level of risk.
- Their attitudes towards risk, with risk-adverse contractors arguing for a low sharing ratio when the uncertainty level is high.
- The desire to influence the contractor’s motivation, with the size of the sharing ratio affecting the contractor’s motivation to keep costs down.
- The contracting parties’ initial perception of the accuracy of the negotiated target cost.
- The size of the target profit, with a large profit encouraging the contractor to choose a higher sharing ratio.
- and the contractor’s desire to increase the chances for profit in the longer term.”

During this research clients expressed the opinion that to give the contractor too high a sharing ratio is counter productive as they may focus too much on saving money and the quality of the project will suffer. The clients also felt that the target cost was not always set accurately in Sweden. To encourage the contractor to set a realistic target cost it was suggested that the contractor is offered 70% of the savings but only 30% of the losses. Also during the tender process the target costs were averaged to find the most sensible target cost. The contractors view was that the earlier they were involved in the process the less the target cost was

altered. Finally it was felt that the target cost became more accurate the longer the client and contractor work together (Badenfelt 2007). Incentives with joint objectives has been suggested as a way of increasing trust (Eriksson and Laan 2007).

2.4 Incentives and Partnering

Construction has a history of adversarial relationships and an uneven balance of risk. This led to Latham (1994) and Egan (1998) amongst others to examine the industry and how this culture can be changed. Partnering was seen as the answer to the low quality of construction and the lack of client satisfaction (Cheung et al 2003). Many reports have now been written such as Achieving Excellence and the Construction Commitments. Contracts specifically allowing collaborative working have been introduced including PPC 2000, JCT CE and NEC3 with the partnering option (Rich 2008). Contracts have also been introduced which include incentives generally called target cost contracts or cost-plus-incentive-fee contracts (Broome and Perry 2002). Kadefors (2004) discusses how incentives have been found to bring about self interest rather than the benevolent attitude required in the partnering project and negotiations about target costs became an issue in Sweden.

Partnering can be described as “a long term commitment between two or more organisations for the purpose of achieving specific business objectives by maximising the effectiveness of each participant’s resources. The relationship is based on trust, dedication to common goals, and an understanding of each other’s individual expectations and values”, as cited in Himes (1995).

There are different types of partnering, strategic partnering is a voluntary form of partnering that is long term in nature (Ngowi 2001). Short term partnering is called project partnering or occasionally tactical (Beach et al 2005).

Partnering is a method of collaboration and does not automatically mean success. Alshawhi and Faraj (2002) discuss how the use of IT can cause problems due to incompatibility with the usual system and how people have different abilities to access the data on the system. Some researchers are very positive about partnering and highlight the financial savings and the opportunity for innovation

while others feel it is a chance for exploitation (Cheung et al 2003). One criticism levelled in some papers is that partnering addresses the symptoms and does not deal with the cause (Chang and Tang 2005). Contractors and clients seem to be more positive about partnering than consultants (Black et al 2000). Olsson and Espling (2004) describe partnering as a way to avoid litigation, keep costs low and to complete the project within time to produce a better working environment. The possible cost savings range from 5 to 30% and possible time savings range from 10 to 40% (Olsson and Espling 2004). Ngowi (2001) discusses how the global market has increased competition and how partnering provides a competitive advantage by the pooling together of resources. However this competitive advantage can provide both private and common benefits. This mixture of both private and common benefits can produce torn loyalties to the organisation and to the partnership. Other potential advantages to partnering include increased client base, access to new work, reduction in risk, higher productivity, increased profits and increase in market share (Ngowi 2001). Partnering must be worked at if it is to succeed. There are four phases to a partnership life cycle. These are Foundation, Implementation, Shakedown and Onwards and Upwards according to Maheshwari et al (2006).

Anon (2003a) discusses the factors that are critical to the project success. These are:

- A shared risk register
- Targets set for health and safety
- Clearly defined roles
- Performance measurement
- Target cost set and open book accounting
- Sharing of efficiency gains
- Clear design quality targets set (Anon 2003a).

The above list was used to inform the questionnaire question on successful projects. Much of the initial research into partnering focussed on what a partnering process needed in order for the project to be considered successful. Different papers give slightly different lists. Ten principles are cited in Akintoye and Main (2007) from Sonnenbery (1992). These are:

Make promises only on what can be delivered
Everyone should be treated with respect
Both partners should gain from the partnering
Specific objectives should be set at the start
Commitment from everyone for a successful partnership
There needs to be an understanding of other people's culture
Champions of the partnership should be developed
Open communication
Make sure decisions are made as a group
Maintain the continuity of the relationship

Some researchers suggest these are all set out in a partnering charter that all parties sign up to (Anon 2003a). Both partners gaining from the partnership or win-win situation comes through in many of the research papers and appears to be important for successful projects (Akintoye and Main 2007).

Many researchers are positive about partnering and Cheung et al (2003) summarises the successful factors in partnering observed by other researchers. These include trust, open communication and equity. The full table is provided in appendix 1 (page 79), but as can be seen incentives do not appear at all in the table.

However partnering projects are not always successful and can fail due to lack of commitment, poor management, poor communication, cultural differences and personal differences (Akintoye and Main 2007). A system of checks and balances can be used to reduce the chances of people using partnering for their own ends. However this does go against the need for trust in partnering (Evans and Weir 1995).

The advantages that can be obtained from a partnering arrangement is seen by some researchers as a sufficient enough incentive on its own. The intrinsic motivation provided with rewards such as social recognition is also seen as an important motivational tool (Lu and Yan 2007). The way in which this intrinsic motivation is triggered is not fully understood but it is thought that flexible work hours, training, employee recognition and pleasant working environment can help

(Appelbaum and Kamal 2000). It may be that the extrinsic motivation of monetary rewards triggers the intrinsic motivation. Monetary incentives also seem to have less influence as the task becomes more complex (Mohd-Sanusi and Mohd-Iskandar 2007). Evans and Weir (1995) discuss how it is important to get the balance of incentives right. Not too easy to achieve and not too difficult. Bresnen and Marshall (2002) also believe that a lot of the motivation research into incentives tends to ignore the intrinsic and personal motivation of individual team members. The goal must be challenging but achievable (Bresnen and Marshall 2000).

Trust is fundamental within a partnering arrangement (Barlow et al 1997). There are different tools available for partnering nowadays which Cheung et al (2003) claims helps to promote trust by identifying areas of distrust. There are five main areas of distrust these are:

- Misalignment of measurements and rewards
- Incompetence
- Lack of appreciation of a system
- Untrustworthy information and
- Failure of integrity.

These were important to consider when writing the questionnaire. To counteract this Cheung et al (2003) suggests using:

- Partnering workshops
- Partnering charter
- Review meetings
- Social functions and
- Partnering newsletters

There are three types of trust Calculus-based, Relational and Institutionalised. Incentives in some papers are seen as a method of building trust (Bresnen and Marshall 2000). Incentives are said to induce Calculus-based trust (Kadefors 2004). For incentives within a partnering arrangement it is misalignment of measurements and rewards and untrustworthy information that is important.

Partnering can occur at different levels to obtain the most from partnering it is argued that it is important to include all from the client through to the suppliers in the partnering arrangement. Supply chain management could offer a competitive advantage with better lead times and customer satisfaction (Akintoye et al 2000). For partnering to be effective it is important that the partnering relates to the companies corporate strategy (Olsson and Espling 2004). Also that it has the backing of the senior management (Black et al 2000).

Second generation partnering now consists of the “Seven pillars” of strategy, membership, equity, integration, benchmarks, project process and feedback (Humphreys et al 2003). Bayliss et al (2004) discusses the TKE contract 604 in Hong Kong. He discusses the partnering mechanism used in the contract and lists the required components:

- Partnering workshops for executives
- Partnering workshops for the contract
- Monthly review meetings
- Social events
- Newsletters
- Incentivisation
- Evaluation framework
- Effect on partnering spirit and
- Effect on contract elements.

This contract utilises a gain share pain share mechanism although the amount is not stipulated. The research found that out of the mechanisms used it is the incentives and review meetings which were the most influential on maintaining the partnering spirit (Bayliss et al 2004). According to Black et al (2000) adjusting price is the most difficult of procedures to establish within a partnering arrangement and it is important that cost control is maintained.

Alliances are not the easy option and in the USA general industry as a whole 50-80% of alliances fail. The main reason put forward for this high level of failure was that expectations were different from results (Stanek 2004). Each party within a construction project has a different agenda which causes a conflict. The contractor and consultants want to make a profit, while the client wishes to

complete the project at minimum cost (Himes 1995). Espling and Olsson (2004) discuss a Swedish partnering project where the aim was to “create a win-win situation where each partner gains more than they would have, through a non-partnering relationship”, the agreed gain share – pain share was 30% between the client and the contractor. Incentives are focused according to Eriksson et al (2007) on the main contractor and client relationship and occasionally with the consultants. This incentivisation does not permeate down the complete supply chain (Eriksson et al 2007). Bayliss et al (2004) argue the need to share the incentives amongst all the key personnel. Egan (1998) discusses how every member of the partnership should make a fair and reasonable return. Cheung et al (2005) notes that some research has found that only the client benefits and that the contractor absorbs the extra cost of the partnering arrangement to increase the chances of further work. Anon (2001) discusses how incentives should not be used as a chance to attack the contractor’s profit margin. In contrast to this Kadefors (2005) discusses that it is the focus on economic incentives which stands in the way of developing true partnering relationships. He found that contractors on gain share pain share showed no innovation but waited for instructions (Kadefors 2005). This research however was carried out in 1999 and therefore may be out of date in the current climate.

It is essential that any incentive scheme used is designed specifically for the particular situation and is imbedded in the partnering package (Espling and Olsson 2004). Griffith (2007) lists the nine factors required for best value in a construction project. These are cost, duration, quality, responsiveness, risk, client satisfaction, added value to business, safety and environmental safeguards.

As described previously risk is an important consideration and partnering should mean a sharing of the risks inherent in the construction project and incentives have a role to play in this (Black et al 2000). Just as how risk v’s the trust is balanced when setting up an incentive scheme this is considered in partnering using incentives but also efficiency v’s equity is also considered and possibly exploitation v’s investment and fight v’s cooperation. The research indicates that parties prefer partnering when both risk and trust is high. The risk considered is both relational risk (will the partner commit) and also performance risk (relationship with the environment). The feeling of equity is important in a partnership and the feeling that one partner is gaining more from the partnership may cause them to

commit less to the partnership (Das and Teng 2001). This may be important for incentives. Bresnen and Marshall (2002) discuss how partnering is dealt with as a technical-managerial problem and ignores the socio-human aspect of partnering. Finally there is a need for transparency to demonstrate fairness within the partnering arrangement CIRA (Anon 2001).

2.5 Summary

Performance management has been well researched within business in general. Incentives were used in Taylor's carrot and stick approach (Reis and Pena 2001). However other researchers such as Maslow found that money is not always the best motivator. The use of incentives should be based on the situation (Mullins 1996).

According to Bresnen (2007) a lot of the literature on incentives is presumed rather than proven. Incentives are used to motivate people to behave in a certain manner (Busi and Bititci 2006). In order for performance to be judged, it must be measured. However in construction it is difficult to measure a lot of aspects such as quality (Milne 2007). In construction incentives tend to focus on the cost because it is easiest to measure (Busi and Bititci 2006). Research in the health care system has shown that it is important that the objectives of each party are aligned (Llewellyn et al 1990). Within the defence industry they found that only the contractor could truly judge if the target cost was set correctly (Scherer 1964).

Risks play an important role in how the incentives should be set and therefore it is important that the contractor and client see the same risks in the project (Sappington 1991). The research shows that it is important that both the agent and the principal benefit from the arrangement (Petersen 1993). Research in Sweden also suggests that the target costs are often not accurately set, but should increase in accuracy the longer the contractor and client work together (Badenfelt 2007). The value of the gain share, pain share should be decided in partnership and not by the client alone (Al-Harbi 1998). Incentives have been accused of encouraging self interest rather than the benevolent attitude required within a partnering arrangement (Kadefors 2004).

Successful projects have open routes of communication, decisions made as a team, clear objectives and everyone treated with respect amongst others (Akintoye and Main 2007). Trust is essential within the partnering arrangement (Barlow et al 1997). Finally Egan (1998) noted that every member should be able to make a fair and reasonable return on the project. This general picture gained from the secondary sources of evidence was then used to inform the primary research objectives.

Chapter 3

Methodology

3.1 Research Approach

Research into secondary sources revealed that secondary sources were primarily written by academics and generally did little more than provide a general background. To balance this the research needed to gather the opinions of people involved in the partnering process and focus on the questions outlined in chapter one. A single case study would not provide enough data to prove or disprove the theory. With the time restrictions interviewing enough people would not be possible. A questionnaire was considered the best way to collect sufficient data for this research (Naoum 1998). A mixture of secondary and primary sources have been used. Primary research gathered qualitative and quantitative data; this is because quantitative is easier to analyse in the restricted time available. Therefore the triangulation was used of both questionnaires with some interviews, to provide the breadth and depth of information from participants of two infrastructure projects in South Wales.

3.2 Case Selection for Primary Research

There was a need to focus a topic that could be too broad, for this reason the writer decided to examine infrastructure projects in South Wales. Two infrastructure projects were chosen and a large number of the participants questioned. Project A uses strategic partnering and is quite a mature partnership. Project B uses tactical partnering and relatively recent in formation. This allows a comparison to be made between the differing aspects of the two partnering projects.

3.3 Summary of Case Study Alliance

Various people from two projects were questioned. Both projects were infrastructure projects in South Wales and both had or were using incentive contracts within a partnering arrangement. Project A is a utilities company with a long term programme for upgrading its systems and involved strategic partnering. Project B was a dock side regeneration scheme utilising tactical partnering.

Project A engaged in the letting of term contracts using the NEC 3 contract with option C with target costs set as the programme progresses for individual projects within the programme. Project B used the target cost contract NEC 2 option C.

Project A has been based upon use of this system for approximately 16 years, whereas project B lasted 2 years. Project A continues to use partnering with incentives while project B has ceased its use and now uses NEC 3 option A (without a partnering arrangement).

Project A has a “strategic partnering charter” which has been signed by all eleven partners including consultants, contractors and the client. Within the partnering charter their mission statement is “To provide best value to Project A with lowest overall costs for its investments in new assets”. Project A defines target cost as “the overall cost of the whole project including all elements (construction, design, project management, ground investigation, land, land compensation, insurances, fees, risk etc)” (Anon 2008).

Project A have a very complicated incentive scheme. The company (client) comes up with a list of projects that must be carried out over the year. The individual projects are then allocated a percentage of the total budget. Therefore each project is allocated a total cost or “business plan cost”. The contractors then provide their target cost and the incentive depends on whether the contractor is above or below the clients total cost. The incentive is greater if the contractor is below “business plan”. The contractor is also liable for a greater percentage of the pain than he would be able to make in gain (Anon 2008).

Project B is now complete, but at the time the pain share gain share was 20% for both the gain share and the pain share. The project target cost was not set until design was about 90% complete.

3.4 Data Collection and Analysis Technique

The qualitative data can be collected by obtaining a sample of people’s opinions from contracts using partnering. The questions within the questionnaire are indirectly asking about factors affecting success of the partnering project. The questions are specifically asking about factors affecting success of using

incentives related to a target cost. The questionnaire consists of closed questions to increase the value of the answers to the researcher, the respondents, grade their answers. This form of question is driven by the fact that analysis is made easier if the respondents are not answering freely because opinions can be directly compared. The questionnaire has been written however with both negative and positive statements so that the respondent will find it much harder to try to give an answer they think that the researcher wants. The title of the dissertation is also not given to them only the topic area, for the same reason. The questionnaire was tested first to check its comprehension and revised before the final questionnaire is sent out. The questionnaire was coded on top so that only the author is aware of who has completed the questionnaire. A letter was sent out with the questionnaire, assuring them of anonymity. The questionnaires were sent to the relevant people via the post or E mail as they preferred. The final questionnaire is to be found in Appendix 2 (page 80).

The questionnaire sets out to test the hypothesis “The use of incentivisation with a gain share of about 15% is a precursor to the achievement of successful infrastructure partnering projects in South Wales.”

The questionnaire consists of seven questions. Question one and two provides general background information which may help to separate the results obtained into groups relating role and experience for analysis.

Question three aims to examine if people agree or disagree with Egan’s statement. This is important as the statement forms the basis of the dissertation. In order to examine what parts people agree or disagree with the statement has been divided into its three component parts. These component parts are that every project should use incentives, the target cost should be set as early as possible and that the incentive should be set at 15% pain / gain.

Question four aims to identify how effective incentive schemes can be developed.

Question five looks at some aspects of incentives and tries to gauge the strength of feeling about some of the potential problems that have been identified by other authors.

Question six aims to ascertain what people define as success by identifying the most important aspects of success.

Finally question seven tries to gauge the degree of success seen in partnering projects. All the questions together aims to collect data which is scarce or missing from the literature on incentivisation and “success” from contracts managers, cost managers, clients and project managers working on infrastructure projects within South Wales.

Once the data has been collected then it has been coded and inputted into SPSS.

The data once inputted into SPSS was then analysed. Different data can be analysed in different ways. Kinnear and Gray (2000) provides a series of flow diagrams to help researchers decide which statistical procedures are suitable for use (appendix 3, page 84). This was used to ensure the correct statistical tests carried out on the resulting data. These were:

Chi-square test – This has been used to test for the differences between the averages in nominal data. Therefore this test has been used to analyse question 3.

The Unrelated t-test – This test is used to test for differences between the means of two sets of scores. This test was therefore used for question 4, 5 and 6.

Spearman’s Rho correlation – This will be used to test the association between two sets of ordinal data. This test has therefore been used on question 4 and 6.

From the results of these analyses it was possible to draw conclusions about the original hypothesis and to suggest further areas for research. This analysis is to be found in chapter five.

3.5 Questionnaire Respondent and Interviewee Sampling Strategy

The questionnaires was sent to a range of people working on the different types of projects. To answer the question “is incentivisation important in successful partnering?” it is important to target the right audience. Therefore selective sampling was carried out. Contract managers, cost managers, clients and Project

Managers have the level of understanding to make judgments on aspects of factors affecting partnering. This was to gain an impression of opinions from 'successful' and 'failed' projects (in the author's opinion). Thirty questionnaires were sent out. Questionnaires are not always returned; therefore to try to increase the chance of more returns the author personally collected the questionnaires at a prearranged date. The projects to be examined are infrastructure projects in South Wales using the partnering option within the NEC contract. Data received from this questionnaire gave an outline idea of opinions on incentives in partnering. The questionnaire design allowed respondents only a limited opportunity to expand on their answers, therefore once the questionnaires had been returned, interviews were arranged. The interviews used a structured approach so that analysis was made easier. The questions were altered very slightly to mirror the questionnaire that the interviewee had completed. The general list of questions are provided in appendix 4 (page 88). For project A four people were interviewed, a project manager, cost manager, contractor and the area cost manager. For project B two people interviewed, a cost manager and the client. This provided a range of views.

3.6 Summary

Both qualitative and quantitative data has been collected through a triangulation of questionnaires and interviews. Both the questionnaires and the interviews were structured to make the analysis easier and to address the aims and objectives of the dissertation. Two infrastructure projects in South Wales were chosen and a selective sample of clients and consultants approached to complete the questionnaires.

Project A is a utilities company which uses strategic partnering while project B was a dock side regeneration project that used tactical partnering. Project A still uses incentivisation within a partnering arrangement while project B no longer uses partnering. Project A has a formal partnering charter while project B used an informal one off partnering arrangement. Project A uses different pain and gain share while project B used an equal percentage.

The data obtained from both the questionnaires and the interviews were analysed by hand and using SPSS to test the dissertation hypothesis. The results from both the questionnaire and interviews are summarised in the next chapter.

Chapter 4

Findings

4.1 Introduction

Thirty questionnaires were distributed and twenty six of the questionnaires were returned which gave an 87% return rate. This was achieved by collecting the questionnaires in by hand. 20 of the questionnaires were completed from people that worked on Project A while only 6 were completed by people that worked on Project B. This was because Project B was smaller and complete, the personnel having moved on were working on other projects and therefore it was harder to find them. A selection of personnel and experience was targeted.

The questionnaire produced a lot of data which has been summarised in Appendix 5 (page 89). The data however is difficult to read in one table and therefore the findings are examined within this chapter question by question.

4.2 Question 1

Question 1 asked for their role within the construction industry.

Role	Project A	Project B	Total
Client	1	1	2
Cost Manager	8	1	9
Contract Manager	4	4	8
Project Manager	1	0	1
Planner	1	0	1
Designer	2	0	2
HSE Advisor	1	0	1
Proposal Manager	1	0	1
Quantity Surveyor	1	0	1

The majority of personnel targeted were cost and contract managers who were directly affected by incentivisation.

4.3 Question 2

Question 2 aimed to assess how much experience they had in working within a partnering arrangement

Project	0–1 Year	1–3 Years	4–6 Years	7-9 Years	10+ Years
A	1	5	7	5	2
B	0	1	2	2	1
Total	1	6	9	7	3

A spread of people were asked but 73% of the respondents had at least 4 years involvement within a partnering arrangement and therefore were an experienced sample.

4.4 Question 3

Question 3 asked for their opinion on the three aspects Egan's statement on how the construction industry can improve.

"I have to say that I would introduce, as early as possible in every possible project, a gain share between the client and the industry, with a target based upon an agreed set of parameters, plus or minus I would say 15%." (Egan 2008).

The following results were obtained.

Project	Feedback	Early as Possible	Every Project	Plus or Minus 15%
A	Agree	17	10	5
	Disagree	3	9	15
	Missing	0	1	0
B	Agree	5	2	2
	Disagree	1	4	4
	Missing	0	0	0
Total	Agree	22	12	7
	Disagree	4	13	19
	Missing	0	1	0

From the table it can be seen that overwhelmingly people agreed with Egan (2008) that incentivisation should be set early in the process.

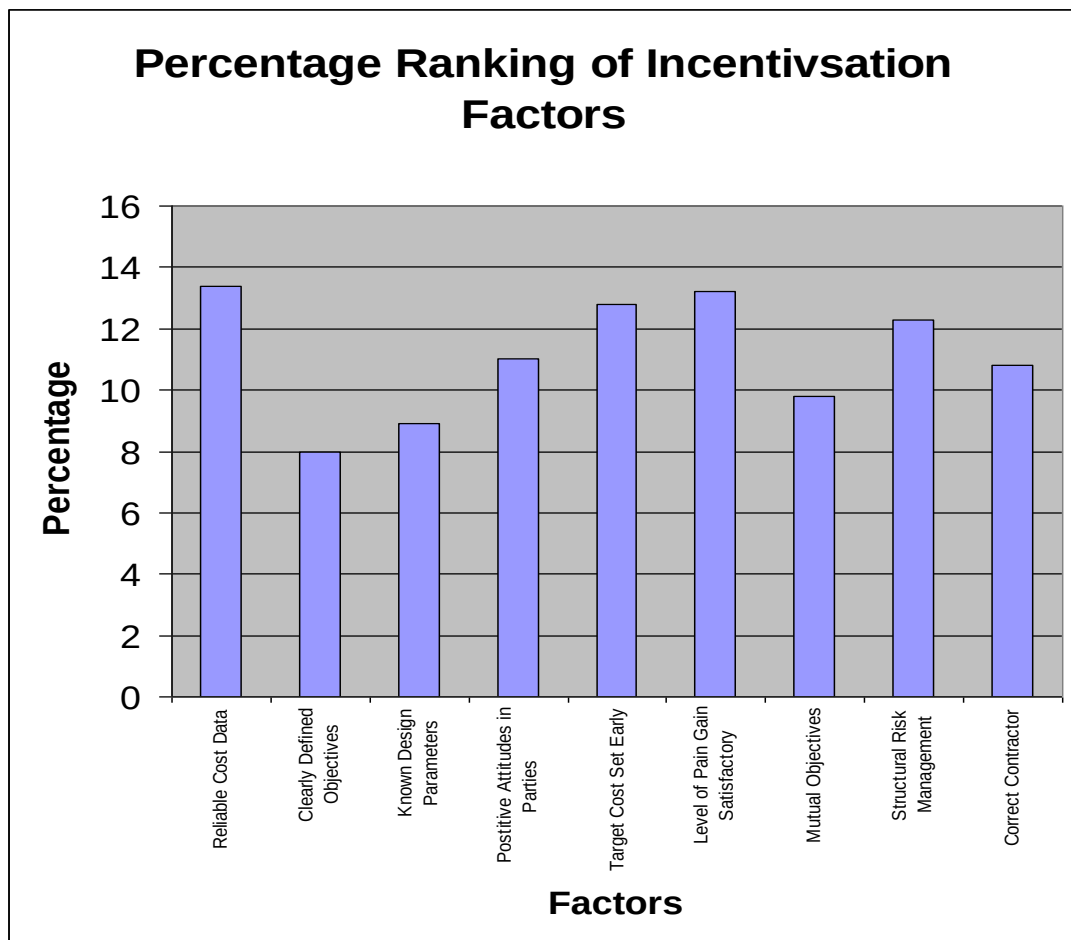
However they were split about the use of incentivisation in every project.

Finally they disagreed with Egan (2008) that the level of incentivisation should be 15%. The comments from the questionnaires are to be found in appendix 6 (page 92). However both lower and higher percentages were suggested. The results were checked as percentages, to see if the number of respondents being greater for project A had an impact. However for this question it yielded the same pattern.

4.5 Question 4

The respondents were asked to rank a series of key factors in establishing and maintaining an effective incentive scheme within a partnering arrangement. The scores have been totalled to summarise the ranking question. However the different number of respondents between the two projects has an impact on the results, therefore to reduce this effect percentages have been used.

Project	Total Ranking Score								
	Reliable Cost Data	Clearly Defined Objectives	Known Design Parameters	Positive Attitude in Parties	Target Cost Set Early	Level of Pain Gain Satisfactory	Mutual Objectives	Structural Risk Management	Correct Contractor
A	12.5%	9.4%	10.8%	9.3%	12.2%	11.7%	9.44%	11.5%	13.0%
B	14.2%	6.5%	6.9%	12.6%	13.4%	14.6%	10.2%	13.0%	8.5%
Total	13.4%	8.0%	8.9%	11.0%	12.8%	13.2%	9.8%	12.3%	10.8%



The smaller the total the more important the factor is seen as. If the totals are placed in order the following results are obtained (most important at the top to the least important at the bottom of the list):

- Clearly defined objectives
- Known design parameters
- Mutual objectives
- The correct contractor
- Positive attitude in parties involved
- Structural risk management process
- Target cost set early
- Level of pain gain satisfactory for all
- Reliable cost data

If it is then split into project A and project B separately the following lists are obtained:

Project A

- Positive attitude in parties involved
- Clearly defined objectives

Project B

- Clearly defined objectives
- Known design parameters

Mutual objectives	The correct contractor
Known design parameters	Mutual objectives
Structural risk management process	Positive attitude in parties involved
Level of pain gain satisfactory for all	Structural risk management process
Target cost set early	Target cost set early
Reliable cost data	Reliable cost data
The correct contractor	Level of pain gain satisfactory for all

The rank order for project A and project B are different. These differences will be discussed in the next chapter.

4.6 Question 5

Six statements were presented to the respondent and they were asked to indicate their opinion using the 7 point Likert scale. The differences in the number of respondents from the two projects changes the results and so the percentages have been used to lessen the effect.

The following results summary was obtained.

Project	Opinion	Set target early	Projects don't need incentives	Performance informs target costs	Incentives aligns objectives	Target cost must be realistic	Target cost is often set too high
A	Agree	75%	55%	55%	60%	90%	55%
	Neutral	20%	15%	25%	15%	0%	25%
	Disagree	5%	30%	20%	10%	5%	20%
	Missing	0%	0%	0%	15%	5%	0%
B	Agree	66.7%	16.7%	33.3%	83.3%	83.3%	66.7%
	Neutral	0%	0%	33.3%	0%	0%	16.7%
	Disagree	33.3%	83.3%	33.3%	16.7%	16.7%	16.7%
	Missing	0%	0%	0%	0%	0%	0%
Total	Agree	70.8%	35.8%	44.2%	71.7%	86.7%	60.8%

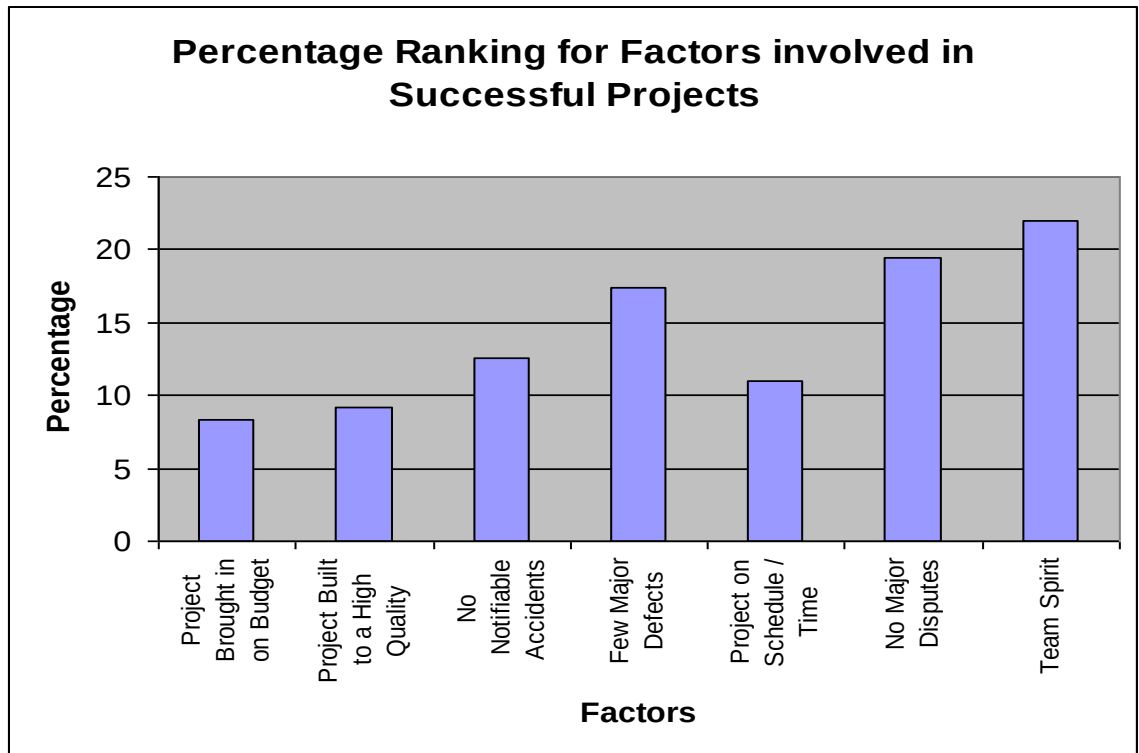
	Neutral	10%	7.5%	29.2%	7.5%	0%	20.8%
	Disagree	19.2%	56.7%	26.7%	13.3%	10.8%	18.3%
	Missing	0%	0%	0%	7.5%	2.5%	0%

Please note that the two results highlighted in blue were the client's answers.

4.7 Question 6

The respondents were asked to rank a series of key factors indicating that the project has been 'successful'. The scores have been totaled to summarise the ranking question. However again the difference in respondents affected the results and so the percentages have been used.

Project	Total Ranking Score						
	Project brought in on budget	Project built to a high quality	No notifiable accidents	Few major defects	Project on schedule / time	No major disputes	Team spirit
A	10.2%	10.5%	9.4%	16.6%	12.55%	19.7%	21.0%
B	6.4%	7.9%	15.9%	18.3%	9.5%	19.1%	23.0%
Total	8.3%	9.2%	12.6%	17.4%	11.0%	19.4%	22.0%



The smaller the total the more important the factor is seen as. If the totals are then placed in order the following results are obtained (most important at the top to the least important at the bottom of the list):

Project brought in on budget
 Project built to a high quality
 Project on schedule / time
 No notifiable accidents
 Few major defects
 No major disputes
 Team Spirit

If it is then split into project A and project B separately the following lists are obtained:

Project A

No notifiable accidents
 Project brought in on budget
 Project built to a high standard
 Project on schedule / time
 Few major defects

Project B

Project brought in on budget
 Project built to a high standard
 Project on schedule / time
 No notifiable accidents
 Few major defects

No major disputes
Team Spirit

No major disputes
Team Spirit

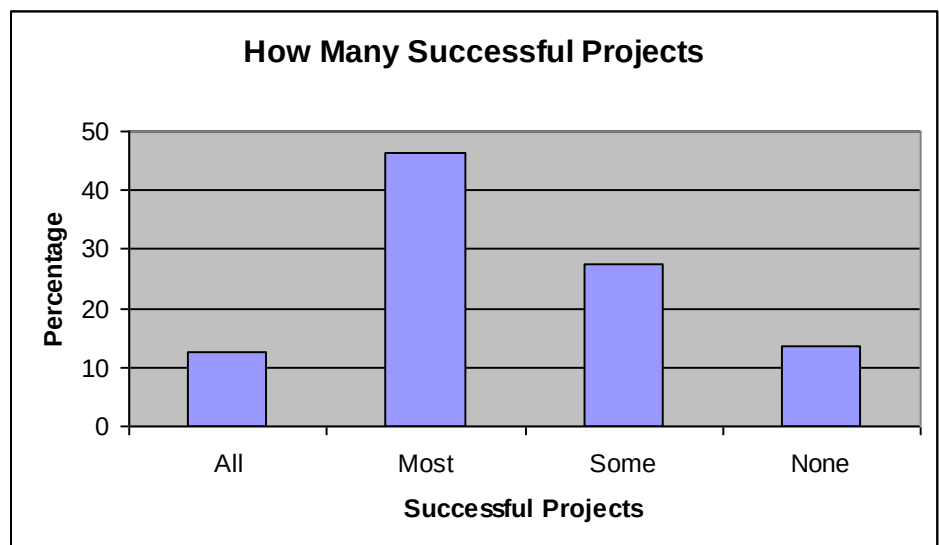
The rank order for project A and project B are only slightly different. These differences will be discussed in the next chapter.

4.8 Question 7

The respondents were asked how many of the projects that they had been involved with, would they consider successful. The following table summarises the results obtained.

Project	All	Most	Some	None
A	25%	60%	5%	10%
B	0%	33%	50%	17%
Total	12.5%	46.5%	27.5%	13.5%

From the table and graph it can be seen that most personnel asked felt that most of the partnering projects they



had been involved with had been successful. What they see as successful and their views on incentives will be examined in the next chapter.

4.9 Interviews

The questions asked in the interviews, as described previously can be found in appendix 4 (page 88). The full transcripts from the interviews are to be found in appendix 7 (page 98). However a summary of the interviews are provided here.

To understand their perspective it is important to know what role they play within the team.

Project A

(302484) – Contractor (Cost Manager)

(302181) – Project Manager

(300464) – Cost Manager

(300565) – Cost Manager

Project B

(300160) – Cost / Project Manager

(290564) – Client

4.9.1 Project A

1) What do you feel about 15% gain share – pain share?

(302484) – Depends .. if you have got accurate target costs.

(302181) – I'll be non-committal on 15% of the gain, it is more a fundamental question of fairness.

(300464) – I think that's a reasonable percentage... each job is different.

(300565) – If the pain share is twisted to be larger than the gain share then it makes pricing a much more onerous or risky task.

The overall perceived picture is that the percentage should depend on the project but that the percentage should be the same for pain and gain.

2) Incentives are said to bring the project in below budget, is the project then successful?

(302484) – If the budget is realistic to start and you can value engineer ... then yes the project could be successful.

(302181) – Yes it does but we need to understand how it has been brought in below budget to say it has been successful.

(300464) – Yes, as long as it is brought in without too much value engineering.

(300565) – No, I think whilst incentivising a project is good it drives lots of behaviours into them.

The overall opinion would appear to be that generally the project is considered successful but that it focuses behaviour on cost.

3) How accurate are the target costs?

(302484) – My concern so far is that they are not very accurate.

(302181) – Well being honest with you, not very.

(300464) – I think we have a better way of calculating them so I think they are accurate, yes.

(300565) – Well theoretically we should say that target costs should always be accurate. You have got to set target costs which are challenging but can be beaten.

The interviewees gave a range of answers depending partly on their role within the process. The contractor thought they were not accurate while the client felt they were fairly accurate.

4) How are the target costs calculated?

(302484) – Based on past experience.

(302181) – We set the target at 70% design.

(300464) – A measurer values by taking off from the drawings and output compared to the programme.

(300565) – Ultimately it's on first principles.

The target costs appear to be set when 70% of the design is complete, but their method varies depending on their role and information available.

5) When is the best time to set the target cost?

(302484) – 100% design and you know exactly what you are building.

(302181) – I don't think setting early is the right way.

(300464) – On completion of a reasonable set of target cost drawings.

(300565) – When the design is sort of 60/70/80% complete depending on the type of job.

Most of the interviewees were happy to set the target costs at about 70% although the contractor wanted to wait until the design is complete.

6) Why is this the best time to set the target cost?

(302484) – Every scheme I have done so far has lost money. Designs change as we have gone along.

(302181) – it directly affects how accurate the target costs are.

(300464) – You need an accurate set of target costs ... to give a fair evaluation.

(300565) – I think the earlier involvement with everything is probably the better and if that can mean the target is set that little bit earlier then there are some advantages because obviously it means that everyone is striving more to a point to make those improvements.

There was a mixture of answers to this question but in general the design needs to be completed so far so that an accurate target cost can be set. The client from project A felt it should be set earlier.

7) Do the use of incentives provide the quality required by the client?

(302484) – Quality costs ... you should be able to achieve the quality required and still come up with an inventive layout.

(302181) – I don't think so. The quality is not that hot.

(300464) – Yes although sometimes I am concerned in that the contractors are left to their own resources.

(300565) – Well I think some of the key things for me are that that the incentivisation only works if you start the thing off properly in terms of you get the right partners on board you have the right programme for the partners to work on and the two sort of fit together.

The contractor felt that the quality could be maintained but the consultants felt that quality could be affected and that monitoring was required.

8) Do incentives work?

(302484) – I feel they can work. It's not working for us as a partner contractor.

(302181) – Yes, in practice. The client has to be fair.

(300464) – Yes, definitely if a company knows that we have to get stuck in and complete this project early and we will make money, rather than a manyana culture of oh well we gat paid anyway.

(300565) – They incentivise people to do better than they would originally predict. It goes back to, if the target is set properly and you have the right people in place incentives are inevitably going to drive behaviours and

improvements to slightly better profit margins that make the client feel he is getting a better deal himself. So it is making sure you set it right so it achieves everyone's objectives rather than just making a few pounds against a few stages.

They feel that incentives can work but they also depend on the target cost being correct, the correct partners and the client being fair. For this project however the contractor is finding that it is not working.

4.9.2 Project B

- 1) What do you feel about 15% gain share – pain share?
(300160) – I think with the contractor the advantage of having a larger percentage is that it gives them a greater incentive to perform and also they are facing a larger penalty if they don't perform. I think so I think it ought to be fair that you carry an equal share of the losses and they will equally get the same share of the profits.
(290564) – + or – 15 is ok. In the early setting of the target cost I don't see as a high priority.

The views were that the percentage of pain share / gain share should be the same and that 15% is acceptable. The client also felt that setting the target cost early is not essential.

- 2) Incentives are said to bring the project in below budget, is the project then successful?
(300160) – Depends on how you measure success, obviously incentives have a financial focus. If a project comes in very late or the quality is very poor then you may not judge it to be successful even though the cost is within budget.
(290564) – Not necessarily below budget. I prefer I must admit a quality product on time and within the target.

The interviewees felt that incentives place the focus on money and that it is possible time or quality could suffer.

3) How accurate are the target costs?

(300160) – The target costs are not accurate, target costs on project B were not accurate because they were arrived at too late a date the contractor had incurred certain problems and he then sought to incorporate those problems within the target cost and repeatedly delayed the establishment of an agreed target cost.

(290564) – I think they are slightly variable in actual fact. On this, I mean, they should be a realistic figure. I like the target fixed when probably we have got about 70% of the packages bid.

The client felt that the design should be 70% complete while the project manager felt that the target cost was set far too late.

4) How are the target costs calculated?

(300160) – The target costs were worked out on the basis of estimated figures.

(290564) – It should be, looking what the scheme incorporates and the potential risks are and what all the implications are. The risks are key.

Estimated figures were used and the client felt that identifying the risks were key to getting an accurate target cost.

5) When is the best time to set the target cost?

(300160) – It has got to be as early as possible.

(290564) – When you got the risks and identified most of them. I am not too worried about that but its sort of 70%.

There is a difference of opinion between as soon as possible and after the risks have been identified.

6) Why is this the best time to set the target cost?

(300160) – The contractor is generally in a position to know how a project is going, he is in a better position, quite often than the client, the longer you leave the establishment of the target cost the less fairness there is then in allowing the client to benefit from any pain the contractor may be incurring.

(290564) – If we are trying to set the target within the 6 weeks, somebody is going to lose and it's a toss of the coin as to which one, but somebody is going to.

The results are again split. The client feels that all the information is required while the project manager feels that the contractor withholds information.

7) Do the use of incentives provide the quality required by the client?

(300160) – I don't think it's necessarily going to provide poor quality but obviously with the focus on cost there is a danger that quality could suffer.

(290564) – Not always. It's a slight problem. It's about choosing your contractor, isn't it.

The general opinion was that quality could suffer and that the correct contractor is important.

8) Do incentives work?

(300160) – I think they can work. I would prefer to see incentives in place than not have incentives in a partnering contract.

(290564) – Yes, 90% of me says yes, 10% of me will always say no on the basis that, it is depending on the team. I think that at the end of the day most contractors or developers would like a little bit of the share of any profits or savings. They must not have pain. The target should have incorporated some of the risks element in any case.

The overall picture is that incentives should be used but that the target cost needs to be accurate so that the contractor does not receive any pain. This summary only covers their main points and other points will be covered in the analysis.

4.10 Questionnaire Full Answers

The full answers are provided in Appendix 6 (page 92). The main points are summarised here.

4.10.1 Project A

- Five respondents thought that the incentivisation should be less than 15%.
- Three respondents thought that the incentivisation should be more than 15%. Two of these were contract managers and worked for the contractor.
- Incentives produce some unintentional behaviour.
- Extra administration costs not suitable for small projects.
- The priorities change depending on the project.
- Health and Safety is a large company focus.
- The risks are an important consideration in the process.
- Open and transparent relationship is essential.

4.10.2 Project B

- Only one respondent commented on the level of incentivisation and that was to say that it should be more than 15%.
- It is important that the contractor follows the quality plan.
- Target costs often set too high.
- More staff required on projects so not suitable for small projects.
- Problems occurred because of design changes.

The contractors would appear to want a higher percentage than the client wishes to give. Incentives can produce behaviour that does not fit with the partnering image. Small projects should not consider partnering because of the extra staff required for administration. It is important that all reasonable risks are identified and design changes kept to a minimum. It is important that quality is maintained. An open and transparent relationship is necessary to avoid target costs being set too high.

4.11 Conclusion

The questionnaires sampled a breadth of people, especially those on project A. The interviews then produced in depth data on certain people's view of incentivisation within a partnering arrangement in the two infrastructure projects in South Wales. Most of the questionnaire questions require analysis before any conclusions can be drawn about them.

Question 3 however has provided respondents opinions on Egan's statement. 50% of project A agreed that incentivisation should be used on every project while 45% disagreed and 5% did not answer. Project B was slightly more negative as 66.7% disagreed and only 33.3% agreed. But overall the split was 41.7% agreed and 55.9% disagreed with 2.5% not answering. Their opinions on setting the target cost and incentive scheme early was more polar. Overall 84.2% agreed with the statement and only 15.8% disagreed and both project A and B agreed on this. Finally the respondents were asked their opinion on the incentive being 15% gain share pain share. Overall only 29.1% of respondents agreed with Egan and 70.9% disagreed. The written answers indicate that the contractors feel it should be greater than 15% and the client's consultants feel that it should be less than 15%.

The interviews gathered a lot of data. Project A interviewees stressed the need for the gain share pain share to be equal and that the percentage should change with the particular project. They believe that incentives focus on the project cost and that quality can suffer if the correct contractor is not used. The contractor felt that they did not calculate the target cost accurately while the client's consultant felt they were accurate. They calculated the target cost differently. The contractor used previous projects to inform the cost while the client's consultants used first principles. The contractor would wish to have the design 100% complete while the client's consultants wish to set the target cost at 70% design completion. Overall they felt that incentives alone would not ensure success but the use of equal pain and gain with the correct people would.

Project B also thought that the pain share gain share should be equal but the client in this case was happy for it to be 50%. The incentives however do place the focus on money and the client in this project was more interested in a quality product. Estimated figures were used to calculate the target cost but the design kept changing. The client felt it was important to wait until there was sufficient data to set an accurate target cost while the client's cost manager felt it was important to set the target cost early before the contractor has the upper hand. A full risk register needs to be produced and extra money put aside for emergencies. Again they feel the correct contractor is essential.

Finally from the questionnaire extended answers for project A the client wishes to lower the percentage pain gain below 15% while the contractors wish to raise it above. However both sides agree that small projects should not consider partnering. Project B also agrees with this. Both projects agree that risks need to be managed and that quality needs to be controlled. However incentives can produce behaviour which goes against the open and honest relationship required within a partnering arrangement. The contractors for project A felt that the target cost was set too low but the majority felt that it was fine or high.

Chapter 5

Analysis

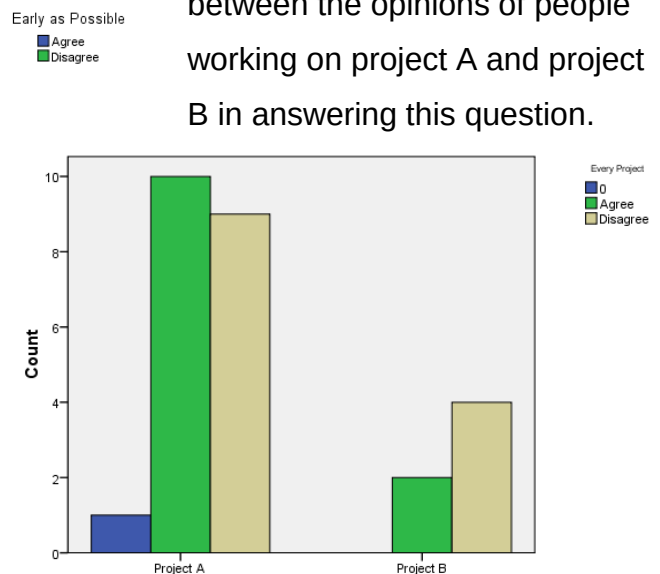
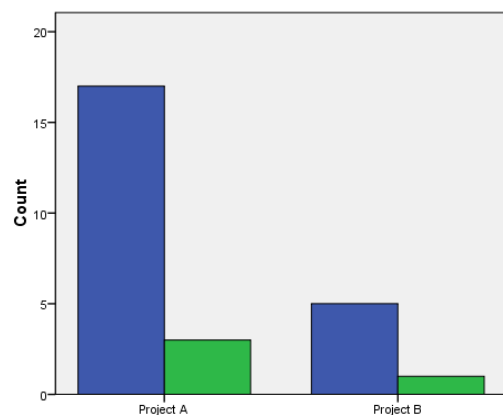
5.1 Introduction

As previously stated the objective of the questionnaire and interviews was to obtain data that could be analysed and then compared with opinions obtained from secondary sources. The data obtained was needed to test the hypothesis, “The use of incentivisation with a gain share of about 15% is a precursor to the achievement of successful infrastructure partnering projects in South Wales”. The first two questions on role and experience provides an extra dimension to the analysis of the data although the main method of analysing the data is by comparing project A to project B.

5.2 Question 3

The respondents were asked if the target cost should be set as early as possible. The graph shows that they 84.2% agreed with Egan. There is no difference

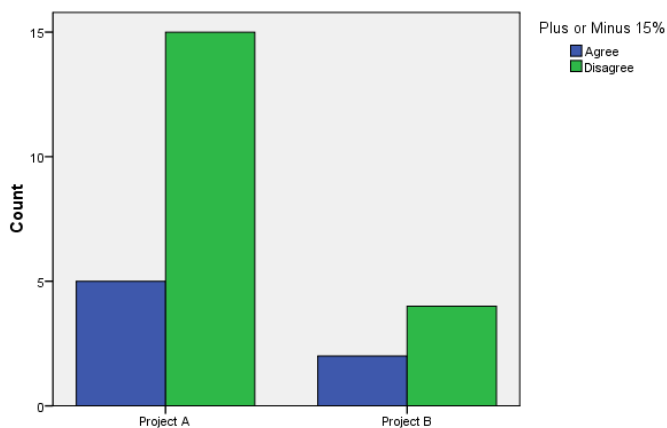
between the opinions of people working on project A and project B in answering this question.



The respondents were then asked if every project should use incentives.

The graph shows that respondents from project A were quite evenly divided but on average were slightly positive towards Egan’s remark. However the respondents from project B if anything were slightly negative about Egan’s remark. Overall 55.9% disagreed with his statement.

The respondents were then asked if a plus or minus 15% should be used for the gain share – pain share.



The graph shows that respondents from project A and B generally both disagreed with this statement. 70.9% disagreed with the statement. The comments mentioned it being both too high and too low.

The data was also analysed by cross tabulation by role and by experience but this did not reveal any significantly new patterns from those shown by comparing project A to project B. The graphs from this cross tabulation are shown in Appendix 8 (page 113). To test the statistical significance of the results a chi squared tests were carried out using SPSS. The results of these tests are shown below.

Company works for * Early as Possible Chi – Square Test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.010 ^a	1	.921	1.000	.676
Continuity Correction ^b	.000	1	1.000		
Likelihood Ratio	.010	1	.922		
Fisher's Exact Test					
Linear-by-Linear Association	.009	1	.922		
N of Valid Cases	26				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .92.

b. Computed only for a 2x2 table

The significance is greater than 0.05 and therefore there is no significant differences between the frequencies for the opinions of people within project A or project B on the statement that incentivisation should be brought in as early as possible.

Company works for * Every Project Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)
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Pearson Chi-Square	1.011 ^a	2	.603
Likelihood Ratio	1.229	2	.541
Linear-by-Linear Association	.970	1	.325
N of Valid Cases	26		

a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is .23.

The significance is greater than 0.05 and therefore there is no significant differences between the frequencies for the opinions of people within project A or project B on the statement that incentivisation should used in every project.

Company works for * Plus or Minus 15% Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.163 ^a	1	.686	1.000	.529
Continuity Correction ^b	.000	1	1.000		
Likelihood Ratio	.158	1	.691		
Fisher's Exact Test					
Linear-by-Linear Association	.157	1	.692		
N of Valid Cases	26				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.62.

b. Computed only for a 2x2 table

Although there appears to be a difference between project A and project B, the significance is greater than 0.05 and therefore there is no significant differences between the frequencies for the opinions of people within project A or project B on the statement that the incentive should be 15%.

5.3 Question 4

The respondents were asked to rank a series of key factors in establishing and maintaining an effective incentive scheme within a partnering arrangement. From the findings the following rank orders were obtained for project A and B using the percentages.

Project A

Positive attitude in parties involved

Project B

Clearly defined objectives

Clearly defined objectives	Known design parameters
Mutual objectives	The correct contractor
Known design parameters	Mutual objectives
Structural risk management process	Positive attitude in parties involved
Level of pain gain satisfactory for all	Structural risk management process
Target cost set early	Target cost set early
Reliable cost data	Reliable cost data
The correct contractor	Level of pain gain satisfactory for all

There are four main differences between the rank orders of project A and project B. These are 'Positive Attitude', 'Design Parameter', 'Level of Pain / Gain' and 'Correct Contractor'. The smallest difference is 'Design Parameters', project B placed it second while project A placed it fourth. The 'Level of Pain / Gain' was placed higher by project A than by project B who placed it last. Project A placed 'Positive Attitude' at the top while project B placed it four places lower in the middle of the rank order. However the largest difference was found in the 'Correct Contractor'. Project A placed this at the bottom while project B placed it third. Project B started with an unclear design which changed frequently during construction. Therefore project B has rated clearly defined objectives and known design parameters for this reason. The correct contractor was rated so highly by project B because it was a one off project and the contractor stalled on agreeing a target cost. Project A has rated positive attitude highly because during the interviews they discussed the distrust that exists in the partnering team. Project A has also placed more emphasis on the level of pain gain because all parties except the client realise that the skewed pain share gain share does not help the win – win idea of partnering.

In order to test if the differences in the means of project A and project B are statistically different for nine factors involved in establishing and maintaining and effective incentive scheme within a partnering arrangement T – Tests were carried out. The results of the T – tests are shown next.

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
Reliable Cost Data	Equal variances assumed	.544	.468	-.315	24	.755	-.383	1.216	-2.893	2.126
	Equal variances not assumed			-.280	7.093	.787	-.383	1.367	-3.607	2.841
Clearly Defined Objectives	Equal variances assumed	1.603	.218	1.121	24	.273	1.433	1.279	-1.206	4.073
	Equal variances not assumed			1.386	12.369	.190	1.433	1.035	-.813	3.680
Known Design Parameters	Equal variances assumed	9.946	.004	1.609	24	.121	1.867	1.160	-.527	4.261
	Equal variances not assumed			2.539	22.884	.018	1.867	.735	.345	3.388
Positive Attitude in Parties involved	Equal variances assumed	.015	.905	-.840	24	.409	-1.117	1.329	-3.861	1.627
	Equal variances not assumed			-.799	7.698	.448	-1.117	1.398	-4.361	2.128
Target Cost Set Early	Equal variances assumed	3.068	.093	-.153	24	.880	-.200	1.309	-2.901	2.501
	Equal variances not assumed			-.125	6.496	.905	-.200	1.604	-4.052	3.652
Level of Pain Gain Satisfactory	Equal variances assumed	.053	.820	-.723	24	.477	-.900	1.245	-3.470	1.670

for Both Parties	Equal variances not assumed			-0.670	7.453	.523	-.900	1.343	-4.036	2.236
Mutual Objectives	Equal variances assumed	1.280	.269	-.049	24	.961	-.067	1.353	-2.858	2.725
	Equal variances not assumed			-.055	9.864	.957	-.067	1.217	-2.782	2.649
A Structural Risk Management Process	Equal variances assumed	.336	.568	-.304	24	.764	-.333	1.097	-2.598	1.931
	Equal variances not assumed			-.306	8.325	.767	-.333	1.091	-2.832	2.165
The Correct Contractor	Equal variances assumed	.001	.978	1.473	24	.154	2.150	1.460	-.863	5.163
	Equal variances not assumed			1.449	8.060	.185	2.150	1.484	-1.268	5.568

From the results of the T – test the only significant result has been highlighted in blue. Known design parameters was the only factor that was statistically significant with a T – test value of 2.539 (22.484 degrees of freedom) and a significance of 0.018. These results mean that project B rates ‘known design parameters’ higher than project A does. This is not to say that the other differences are anomalies but a larger project B sample is required to confirm them.

The Spearman’s Rho statistical test was then carried out in order to ascertain if there is any correlation between any of the factors. The results obtained can be seen in the following table.

Correlations

			Reliable Cost Data	Clearly Defined Objectives	Known Design Parameters	Positive Attitude in Parties involved	Target Cost Set Early	Level of Pain Gain Satisfactory for Both Parties	Mutual Objectives	A Structural Risk Management Process	The Correct Contractor
Spearman's rho	Reliable Cost Data	Correlation Coefficient	1.000	.074	.279	.391*	.366	.206	.102	.185	.130
		Sig. (2-tailed)	.	.720	.167	.048	.066	.313	.622	.364	.527
		N	26	26	26	26	26	26	26	26	26
	Clearly Defined Objectives	Correlation Coefficient	.074	1.000	.324	-.118	-.056	.441*	.371	.148	.179
		Sig. (2-tailed)	.720	.	.106	.567	.785	.024	.062	.469	.381
		N	26	26	26	26	26	26	26	26	26
	Known Design Parameters	Correlation Coefficient	.279	.324	1.000	-.270	.397*	-.272	-.036	.071	.343
		Sig. (2-tailed)	.167	.106	.	.183	.044	.178	.860	.732	.086
		N	26	26	26	26	26	26	26	26	26
	Positive Attitude in Parties involved	Correlation Coefficient	.391*	-.118	-.270	1.000	-.025	.380	.166	-.023	-.014
		Sig. (2-tailed)	.048	.567	.183	.	.902	.056	.418	.912	.945
		N	26	26	26	26	26	26	26	26	26
	Target Cost Set Early	Correlation Coefficient	.366	-.056	.397*	-.025	1.000	-.004	-.028	.224	-.141
		Sig. (2-tailed)	.066	.785	.044	.902	.	.986	.893	.270	.493
		N	26	26	26	26	26	26	26	26	26
	Level of Pain Gain	Correlation Coefficient	.206	.441*	-.272	.380	-.004	1.000	.429*	.032	-.075

Satisfactory for Both Parties	Sig. (2-tailed)	.313	.024	.178	.056	.986	.	.029	.878	.717
	N	26	26	26	26	26	26	26	26	26
Mutual Objectives	Correlation Coefficient	.102	.371	-.036	.166	-.028	.429*	1.000	.064	.130
	Sig. (2-tailed)	.622	.062	.860	.418	.893	.029	.	.757	.527
	N	26	26	26	26	26	26	26	26	26
A Structural Risk Management Process	Correlation Coefficient	.185	.148	.071	-.023	.224	.032	.064	1.000	.161
	Sig. (2-tailed)	.364	.469	.732	.912	.270	.878	.757	.	.432
	N	26	26	26	26	26	26	26	26	26
The Correct Contractor	Correlation Coefficient	.130	.179	.343	-.014	-.141	-.075	.130	.161	1.000
	Sig. (2-tailed)	.527	.381	.086	.945	.493	.717	.527	.432	.
	N	26	26	26	26	26	26	26	26	26

*. Correlation is significant at the 0.05 level (2-tailed).

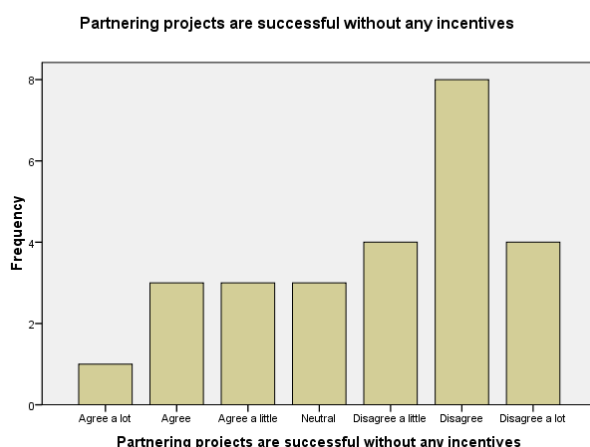
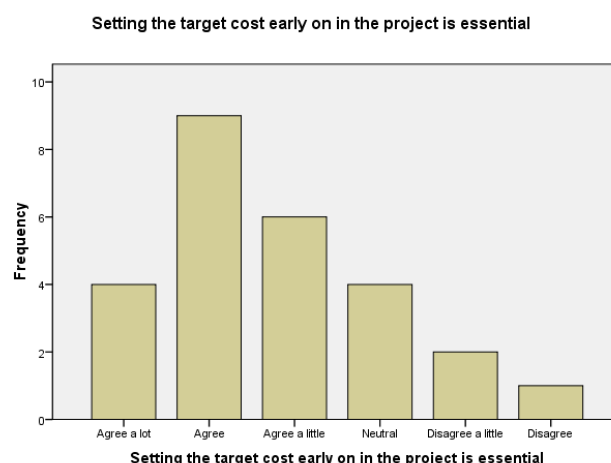
The Spearman's Rho statistical test provided four significant results. These are highlighted in blue. 'Reliable cost data' has a positive correlation against 'positive attitude in parties involved'. The correlation coefficient achieved was 0.391 with a significance of 0.048. This is a weak to moderate relationship. This means that if people feel that reliable cost data is required they also tend to feel that a positive attitude is required and visa versa. 'Clearly defined objectives' has a positive correlation against 'level of pain/gain satisfactory for both parties'. The correlation coefficient achieved was 0.441 with a significance of 0.024. This is a moderate relationship. If people feel that clearly defined objectives are important then they tend to feel that the level of pain gain is also important. 'Known design parameters' has a positive correlation against 'target cost set early'. The correlation coefficient achieved was 0.397 with a significance of 0.044. This is a weak to moderate relationship. This means that if they feel that 'known design parameters' is important they will likely also feel that the target cost should be set early. 'Level of pain / gain satisfactory for both parties' has a positive correlation against 'mutual objectives'. The correlation coefficient achieved was 0.429 with a

significance of 0.029. This is a moderate relationship. This means that it is likely that if the level of pain gain is important then they will also feel that mutual objectives are important.

5.4 Question 5

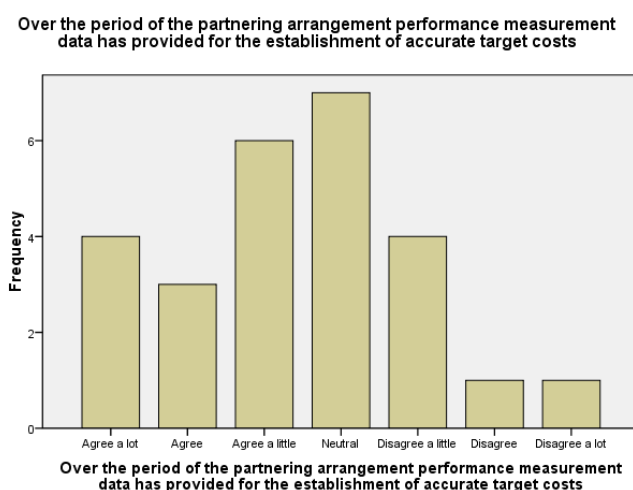
The respondents were asked to indicate their opinion about six statements using a seven point Likert scale.

The graph shows that most of the respondents agreed that the target cost should be set early. This agreed with the results obtained in question three. This is at odds with the views of the people interviewed.

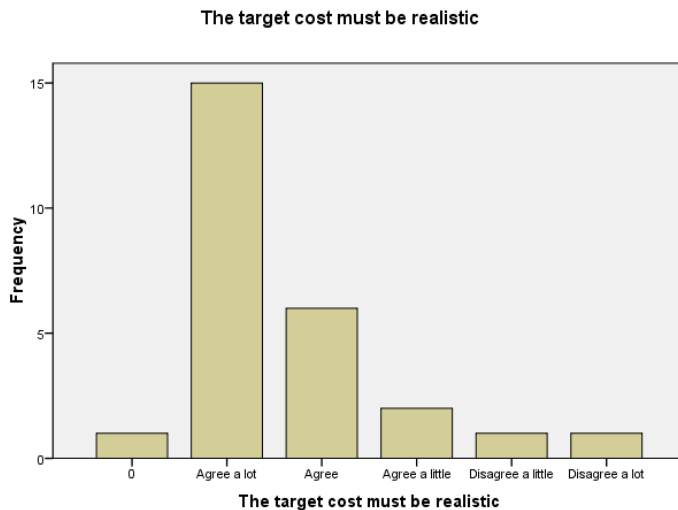
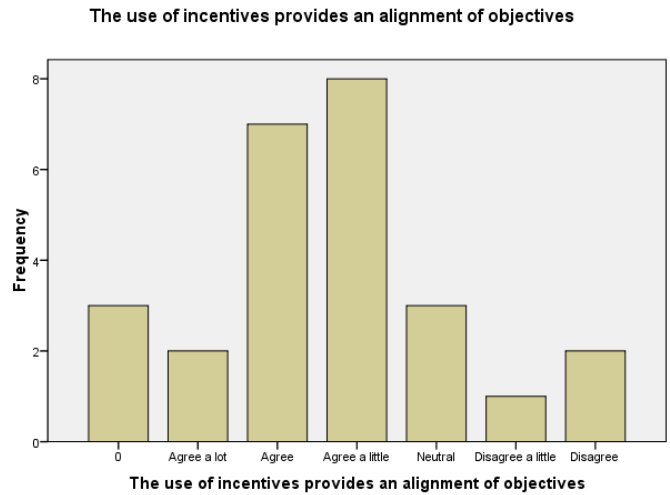


The graph shows that most respondents disagreed that partnering projects are successful without the use of incentives. Therefore they feel that the use of incentives help make partnered projects successful.

The graph shows that most respondents were neutral to positive about how partnering arrangement performance measurement data has provided the establishment of accurate target costs. This neutrality probably arises because there is not much collection or utilisation of actual cost data being incorporated within target costs.

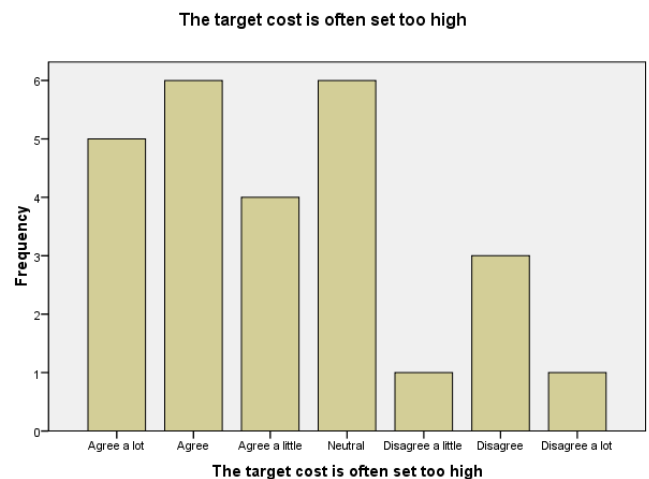


The graph shows that the respondents generally agreed that the use of incentives provides an alignment of objectives. The client of project B however did not agree that it provided alignment and the agreement is quite weak as if it is only part of what is required to align objectives.



The graph shows that the respondents agreed strongly with the statement that the target cost must be realistic. This seems to be because both projects have struggled with producing accurate target costs.

The graph shows that generally the respondents agreed that the target cost is set too high. Most of the respondents feel that the target cost is high while the contractor's people feel it is too low. The contractor is currently in pain not gain therefore perception is perhaps different to the reality.



In order to test if the differences in the means of project A and project B are statistically different for six statements T – Tests were carried out. The results of the T – tests are shown below.

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
Setting the target cost early on in the project is essential	Equal variances assumed	2.325	.140	-1.189	24	.246	-.733	.617	-2.006	.540
	Equal variances not assumed			-.914	6.173	.395	-.733	.802	-2.682	1.216
Partnering projects are successful without any incentives	Equal variances assumed	2.087	.161	-.353	24	.727	-.300	.851	-2.056	1.456
	Equal variances not assumed			-.394	9.965	.702	-.300	.761	-1.997	1.397
Over the period of the partnering arrangement performance measurement data has provided for the establishment of accurate target costs	Equal variances assumed	.394	.536	-1.021	24	.317	-.750	.734	-2.266	.766
	Equal variances not assumed			-1.101	9.321	.299	-.750	.681	-2.283	.783
The use of incentives provides an alignment of objectives	Equal variances assumed	.412	.527	-.597	24	.556	-.450	.754	-2.006	1.106
	Equal variances not assumed			-.616	8.658	.554	-.450	.731	-2.113	1.213

The target cost must be realistic	Equal variances assumed	3.066	.093	-.830	24	.415	-.567	.683	-1.976	.842
	Equal variances not assumed			-.561	5.638	.597	-.567	1.011	-3.078	1.945
The target cost is often set too high	Equal variances assumed	.544	.468	1.099	24	.283	.900	.819	-.790	2.590
	Equal variances not assumed			.973	7.057	.363	.900	.925	-1.284	3.084

From the results of the T – test there are no significant results. These results mean that project A and project B respondents have similar opinions about the statements. A larger selection may have proved these results statistically significant.

5.5 Question 6

The respondents were asked to rank a series of key factors indicating that the project has been ‘successful’.

From the findings the following rank orders were obtained for project A and B.

Project A

No notifiable accidents
Project brought in on budget
Project built to a high standard
Project on schedule / time
Few major defects
No major disputes
Team Spirit

Project B

Project brought in on budget
Project built to a high standard
Project on schedule / time
No notifiable accidents
Few major defects
No major disputes
Team Spirit

There is only one significant difference between the rank orders of project A and project B. This is for ‘No Notifiable Accidents’. Project A rates this very highly and places it at the top while project B ranks it fourth. Other than this both project A and B rate the project being brought in on time and built to a high standard much more than they rate disputes and a team spirit. This could be because one of

project A's key performance indicators is its health and safety record and so they would put more emphasis on this.

In order to test if the differences in the means of project A and project B are statistically different for seven factors indicating that a project has been 'successful', T – Tests were carried out. The results of the T – tests are shown below.

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
Project brought in on budget	Equal variances assumed	1.809	.191	1.973	24	.060	1.417	.718	-.065	2.898
	Equal variances not assumed			2.528	13.508	.025	1.417	.560	.211	2.623
Project built to a high quality	Equal variances assumed	.793	.382	1.583	24	.126	1.183	.747	-.359	2.726
	Equal variances not assumed			1.900	11.549	.083	1.183	.623	-.180	2.546
No notifiable accidents	Equal variances assumed	.003	.959	-.746	24	.463	-.783	1.051	-2.952	1.385
	Equal variances not assumed			-.747	8.279	.476	-.783	1.049	-3.187	1.621
Few major defects	Equal variances assumed	1.557	.224	.670	24	.510	.667	.996	-1.388	2.722
	Equal variances not assumed			.548	6.512	.602	.667	1.217	-2.256	3.589

Project on schedule/time	Equal variances assumed	1.493	.234	2.307	24	.030	1.400	.607	.147	2.653
	Equal variances not assumed			2.593	10.072	.027	1.400	.540	.198	2.602
No major disputes	Equal variances assumed	.286	.598	1.527	24	.140	1.350	.884	-.474	3.174
	Equal variances not assumed			1.260	6.561	.251	1.350	1.072	-1.219	3.919
Team spirit	Equal variances assumed	1.102	.304	.829	24	.415	.867	1.045	-1.291	3.024
	Equal variances not assumed			.705	6.761	.504	.867	1.229	-2.061	3.794

From the results of the T – test the significant results have been highlighted in blue. Project brought in on budget was one of the factors that was statistically significant with a T – test value of 2.528 (13.508 degrees of freedom) and a significance of 0.025. These results mean that project B rates ‘project brought in on budget’ higher than project A does. Project on schedule / time was the other factor that was statistically significant with a T – test value of 2.307 (24 degrees of freedom) and a significance of 0.03. These results mean that project B rates ‘project on schedule / time’ higher than project A does. Project B sees the project in a traditional way where money and time are seen as the most important. Where as project A see the project as a more rounded picture.

The Spearman’s Rho statistical test was then carried out in order to ascertain if there is any correlation between any of the factors. The results obtained can be seen in the following table.

Correlations							
	Project brought in on budget	Project built to a high quality	No notifiable accidents	Few major defects	Project on schedule/time	No major disputes	Team spirit

Spearman's rho	Project brought in on budget	Correlation Coefficient	1.000	.361	-.156	.186	.563**	.455*	.063
		Sig. (2-tailed)	.	.070	.447	.362	.003	.019	.761
		N	26	26	26	26	26	26	26
	Project built to a high quality	Correlation Coefficient	.361	1.000	-.012	.476*	.385	.274	.250
		Sig. (2-tailed)	.070	.	.955	.014	.052	.176	.219
		N	26	26	26	26	26	26	26
	No notifiable accidents	Correlation Coefficient	-.156	-.012	1.000	.376	.078	.056	.478*
		Sig. (2-tailed)	.447	.955	.	.058	.705	.787	.013
		N	26	26	26	26	26	26	26
	Few major defects	Correlation Coefficient	.186	.476*	.376	1.000	.266	.112	.329
		Sig. (2-tailed)	.362	.014	.058	.	.189	.586	.101
		N	26	26	26	26	26	26	26
	Project on schedule/time	Correlation Coefficient	.563**	.385	.078	.266	1.000	.498**	.301
		Sig. (2-tailed)	.003	.052	.705	.189	.	.010	.135
		N	26	26	26	26	26	26	26
	No major disputes	Correlation Coefficient	.455*	.274	.056	.112	.498**	1.000	.145
		Sig. (2-tailed)	.019	.176	.787	.586	.010	.	.480
		N	26	26	26	26	26	26	26
	Team spirit	Correlation Coefficient	.063	.250	.478*	.329	.301	.145	1.000
		Sig. (2-tailed)	.761	.219	.013	.101	.135	.480	.
		N	26	26	26	26	26	26	26

** . Correlation is significant at the 0.01 level (2-tailed).

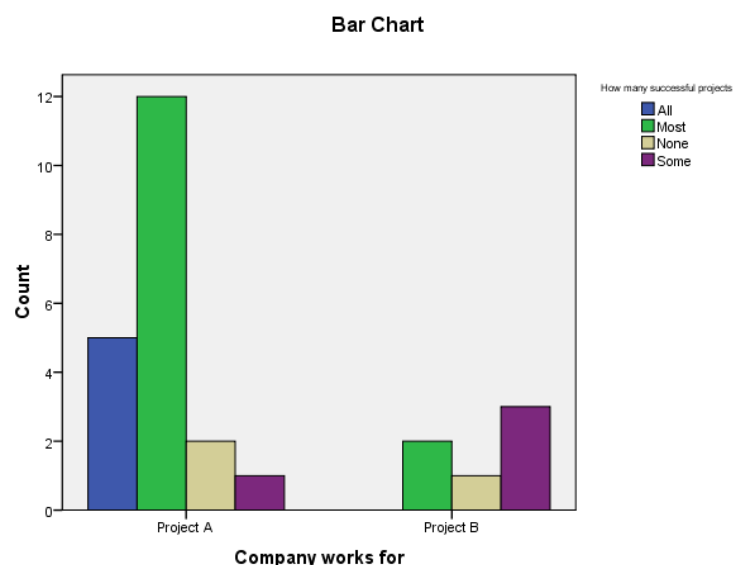
* . Correlation is significant at the 0.05 level (2-tailed).

The Spearman's Rho statistical test provided five significant results. These are highlighted in blue. 'Project brought in on budget' has a positive correlation against 'project on time / schedule'. The correlation coefficient achieved was 0.563 with a significance of 0.003. This is a moderate relationship. Respondents felt that if a project is a success for being brought in on budget it should also be brought in on time. 'Project brought in on budget' has a positive correlation against 'No major disputes'. The correlation coefficient achieved was 0.455 with a significance of 0.019. This is a moderate relationship. This means that if the respondents feel that the project being brought in on budget makes the project successful then they will also feel that no major disputes were important. 'Project built to a high quality' has a positive correlation against 'Few major defects'. The correlation coefficient achieved was 0.476 with a significance of 0.014. This is a moderate relationship. Perhaps unsurprisingly respondents felt that if the project was built to a high quality then there were fewer major defects. 'No notifiable accidents' has a positive correlation against 'team spirit'. The correlation coefficient achieved was 0.478 with a significance of 0.013. This is a moderate relationship. They felt that no notifiable accidents had a positive impact on team spirit which could help the success of the project. 'Project on schedule / time' has a positive correlation against 'no major disputes'. The correlation coefficient achieved was 0.498 with a significance of 0.010. This is a moderate relationship. The respondents felt that in order to bring a project in on time / schedule then there would be fewer major disputes and this represents success.

5.6 Question 7

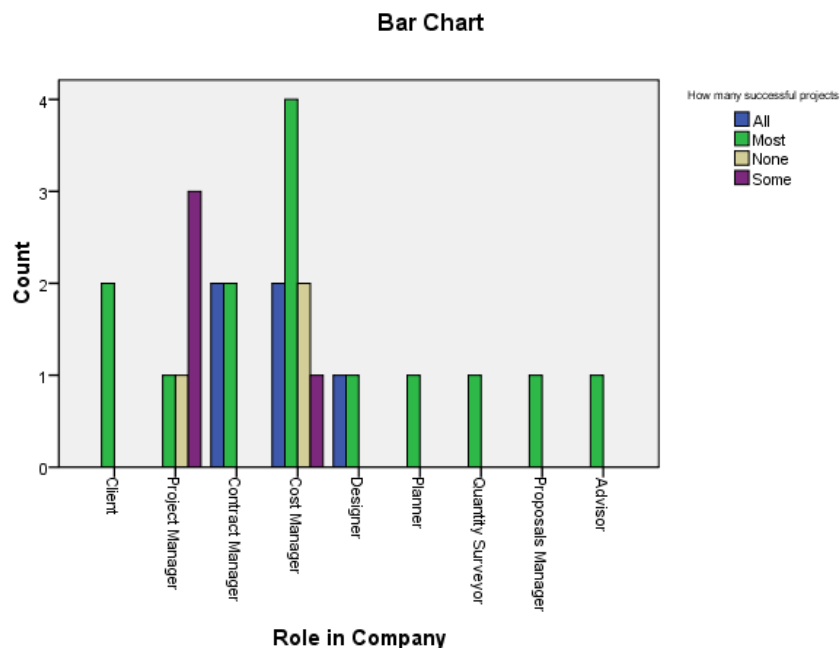
The respondents were asked if they thought that the partnering projects they had been involved in were successful.

The graph shows that the respondents from project A are more



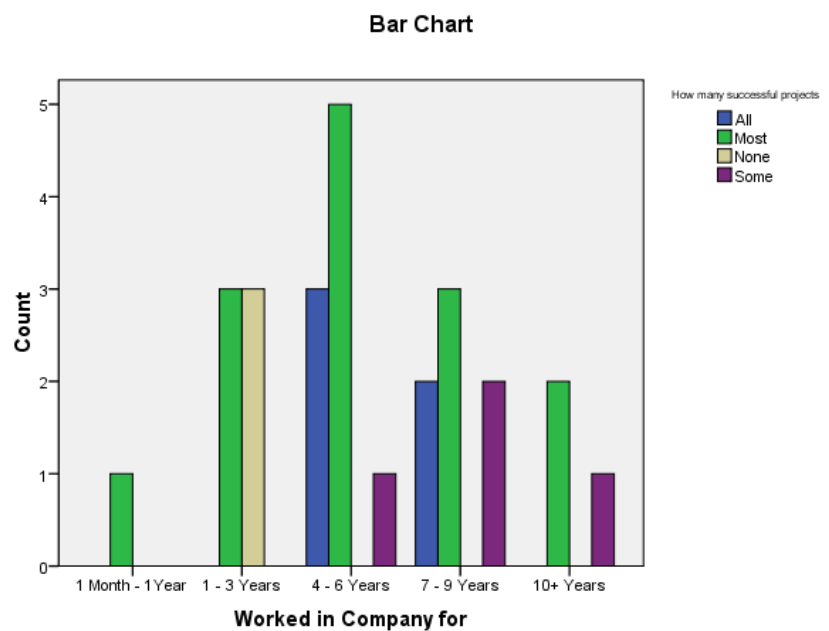
positive about partnering and felt that most of the projects were successful.

However project B felt that only some of the projects were successful and no one felt that all the projects had been successful.



The graph shows that the project managers are the most negative about partnering. While most contract managers are the most positive.

The number of years that they had worked in a partnering arrangement had very little effect on their opinion of how successful the projects are.



5.7 Conclusion

The analysis started, like the whole dissertation, with Egan's statement. The respondents did not agree with all three aspects. They agreed with the target cost being set as early as possible. This contradicted the views of the interviewees who said that the design needs to be 70% complete. They were slightly negative (55.9%) about using incentives within partnering for every project. This may well

be because of the increased administration costs, which small projects would be unable to absorb. The final aspect of Egan's statement is that 15% should be the value used for the pain share / gain share. 70.9% of the respondents disagreed with Egan on this. The contractor felt it should be a higher percentage, whereas the client's consultants felt it should be lower. There was no statistical significance in this but this could be because of the small number of respondents from project B.

When respondents gave their opinion on factors important to effective incentivisation schemes there were differences between project A and B. Project B had problems in completing the design and it changed many times, and so project B rated 'clearly defined objectives' and 'known design parameters' higher than project A did. The contractor in project B stalled the agreement of the target cost because of the design changes and so again this is why project B has rated 'the correct contractor' so highly. During the project A interviews there was a lot of negativity and distrust between the parties and therefore they have rated 'positive attitude' higher than project B. Again they have rated 'level of pain / gain satisfactory to both parties' higher than project B because the complicated incentive scheme used means that they can receive more pain than they could possibly gain. The contractor and the consultants in project A are aware that this is not good for the incentive scheme. Statistically there is definitely a difference between the means of project A and B for 'known design parameters'.

Spearman's Rho test was then carried out to examine any correlation between the factors. Four significant results were obtained. People feel that if reliable cost data is required they also tend to feel that a positive attitude is required. If people feel that clearly defined objectives are important then they tend to feel that the level of pain gain is also important. If they feel that 'known design parameters' is important they may also feel that the target cost should be set early. Finally if they feel that the level of pain gain is important then they will also feel that mutual objectives are important.

The questionnaire then asked for the respondents' opinions to six statements. From these results the following observations can be made:

- The target cost should be set early.
- Incentives help to make partnered projects successful.

- There is not enough collection or utilisation of actual cost data being incorporated within the target costs.
- Incentives often help in the alignment of objectives.
- The target cost must be realistic.
- The target cost is often perceived as being set too high.

When respondents gave their opinion on factors important to successful projects there was only one difference between project A and B. The difference was with 'no notifiable accidents'. Project A uses health and safety as a key performance indicator and this is why they rate it so highly. Other than this one point however there is an agreement that the most important factor is bringing the project in on budget. Statistically project B rates the financial side of 'bringing the project in on budget' higher than project A. This is in part due to project A's focusing on health and safety and partly due to project B's more traditional view. Spearman's Rho test was then carried out to examine any correlation between the factors. Five significant results were obtained. Respondents felt that if a project is a success for being brought in on budget it should also be brought in on time. If the respondents feel that the project being brought in on budget makes the project successful then they will also feel that no major disputes are also important. Respondents felt that if the project was built to a high quality then there were fewer major defects. They felt that no notifiable accidents had a positive impact on team spirit which could help the success of the project. Finally the respondents felt that in order to bring a project in on time / schedule then there would be fewer major disputes and this represents success.

The results obtained from both the interviews and the questionnaires need to be used to complete the aims and objectives for the dissertation. In order to answer the hypothesis, in the following chapter, the results will be compared to the secondary and related to the questions set out in the introduction.

Chapter 6

Conclusion

6.1 Introduction

The aim of the dissertation was to test the hypothesis “The Use of Incentivisation with a Gain Share of about 15% is a Precursor to the Achievement of Successful Infrastructure Projects in South Wales”.

In order to achieve this aim definitions of partnering and incentivisation were provided. Secondary data provided an in depth examination of incentivisation and its application within partnering. Whilst these sources provided general background information they provided limited answers to the hypothesis. In order to gather this data focus was provided via primary research using questionnaires and interviews.

To address the hypothesis the author focussed on the following questions when designing the questionnaire and interviews. These questions arose from Egan’s statement “I have to say that I would introduce, as early as possible in every possible project a gain share between the client and the industry with a target based upon an agreed set of parameters, plus or minus, I would say 15%” (Egan 2008). These questions were:

- Should incentivisation be used on every project?
- Should the target cost and incentive be set as early as possible?
- Should the incentives be set at 15%?
- Should the incentive percentage be the same for pain share and gain share?
- What makes a project successful?
- What factors are important in an incentive scheme?

The answers to these questions were....

6.2 Should incentivisation be used on every project?

Both project A and project B were split on whether incentivisation should be used on each project but over all 41.7% agreed that every project should use incentivisation while 55.9% disagreed. The reasons provided by the respondents for disagreeing was that partnering and incentivisation schemes require extra administration and administration staff that could not be afforded on small construction projects. Respondents agreeing with the statement did not provide any clarification.

6.3 Should the target cost and incentive be set as early as possible?

Over all 84.2% of the respondents agreed with Egan that the target cost should be set as early as possible and only 15.8% disagreed. However during the interviews the interviewee's discussed how the design needed to be 70% complete so that an accurate target cost could be calculated. Research from Sweden showed that target costs are often not very accurate but that they become more accurate the longer they work together (Badenfelt 2007). Project A has worked as a partnering arrangement for sixteen years but they are still complaining that the target costs are not accurate which is not in line with Badenfelt's work. The contractor's cost manager would prefer to have the design 100% complete before the target cost is set. Research from the defence industry indicates that the contractor is the only person who can truly judge if the target cost is set correctly (Scherer 1964). The contractor was in pain and this may be the reason for this wish. Until the designs have been completed more risks exist.

6.4 Should the incentives be set at 15%?

70.9% of the respondents disagreed with Egan on this statement and only 29.1% agreed. This was similar for both projects. The contractor generally wanted a larger percentage than 15% and the client's consultants wanted it lower, in some cases as low as 5%. These results were perhaps unsurprising as the client wishes to save money and the contractor wishes to make money. However the client for project B was happy for the pain share gain share to be 50%. This contradicts the other results. The focus of the project however was on quality and then time rather than cost. Incentives focus the parties on cost (Busi and Bititci

2006). Using such a large percentage for the pain share gain share, contradicts the clients focus on time and quality.

6.5 Should the incentive percentage be the same for pain share and gain share?

This particular question evolved when the author read the partnering charter for project A. As described previously project A implement a complicated incentive scheme but the pain share percentage is always larger than the gain share percentage. During the interviews both the client's consultants and the contractors emphasised the need for a 'fair' incentive scheme from project A. Al – Harbi (1998) discusses how it is important that the value of the pain share gain share should be decided in partnership. The interviewees from project A did not agree with this view as long as the pain share and gain share percentage was the same value. Project B however agreed to a certain extent with Al – Harbi (1998) and discussed how the percentage would depend upon the nature of the particular project. They did however think that the discussion should be led by the client and not by the contractor.

6.6 What makes a project successful?

Incentives are said to focus on cost because it is easy to measure (Busi and Bititci 2006). Cost however is only part of the picture and so the questionnaire and interview questions asked about time, quality and health and safety as well. Both project A and B felt that quality could suffer especially if the correct contractor is not used. Project A use health and safety as one of their key performance indicators so for them a reduction in notifiable accidents is important, while for project B quality is the focus. Therefore the individual project and the client dictates the individual focus and therefore what success means. One incentive scheme will not suit every project and will require adaptation.

6.7 What factors are important in an incentive scheme?

Project A and project B have different views on what makes an effective incentive scheme. Their views on what factors were important in an effective incentive scheme depended largely on their experience in previous projects and therefore on the type of project they are involved in and the type of partnering. Therefore for

project B they felt that known design parameters and the correct contractor were very important. Project A suffers from a lack of trust and communication between the partners and therefore placed positive attitude in parties involved as the most important within an incentive scheme. Both project A and B found clearly defined objectives to be very important but surprisingly rated setting the target cost early very low given the contradictory answers earlier in the questionnaire.

6.8 Conclusion

This research has demonstrated that partnering is not suitable for all projects. Incentivisation places a focus on cost and this can have a detrimental effect on the other aspects that exist within the oft quoted triangle of time, cost and quality. The level at which to set the percentage for gain share is also a divisive issue but a substantial majority of respondents disagreed with the 15% suggested by Egan. The timing of the setting of the target cost was a problem on both projects with a reluctance by both contractors to set it early in the process. Project B did not judge partnering a success primarily because the target cost was not set early enough placing most risk upon the client. Project A has contractors that are unhappy with the uneven pain gain share and a lack of trust between the parties. Neither of these projects can be adjudged a success from the perspective of both parties. Incentivisation does not of itself appear to be the key to success and a level of 15% would not generally satisfy either party. Measures of success varied between parties and clients project A having a focus on cost and B on quality. What represents success to one client would not equal success to the other. Both contractors had a focus on maximising gain.

Overall it must be concluded that the hypothesis was not proven. Egan's view appears to be too simplistic to apply in all situations and is not always the key to success as he suggests.

6.9 Critique

The topic chosen was very broad and the attempt to focus on a sector and area did reflect negatively upon the validity of the conclusions. Project B proved difficult because the parties had moved on particularly on the contractors side which meant the information gathered had a client bias. Because of the lack of secondary sources focussed upon this area the research relied heavily upon the

primary sources. The resources available for the primary research were limited and thus impacted upon the quality of this element. In particular it was difficult to arrange interviews and the quality of the responses in some cases was poor. The structure of the chapter on the findings of the primary research is complex particularly in relation to the interviews. The primary research provided a great deal of information to discuss and analyse and thus does not make for easy reading.

6.10 Future research

The writer has recognised the breadth of the subject chosen and the limited area covered by her research. There is ample scope for further research into the incentivisation in partnering as secondary sources were limited in the amount of research as opposed to opinion published on this topic. It is also clear that the success of partnering must also be questioned as the limited sample viewed suggested that the approach has its problems particularly on infrastructure projects in South Wales.

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Appendices

Appendix One

Comparison of Critical Elements for Successful Partnering.

Associated General Contractors (Partnering: A Concept 1991)	Saunders and Moore (1992)	Reading Forum (Trusting 1995)	Kumaraswamy and Matthews (2000)	Construction Industry Institute Australia (Partnering: Models for Success 1996)	Cheng, Li and Love (2000)	DeVilbiss and Leonard (2000)
Commitment	Cooperative management team	Free and open communication	Goals and objectives	Commitment	Adequate resources	Trust
Continuous evaluation	Cooperation	Open book costing	Trust	Trust	Management support	Understanding of partner's needs
Equity	Open communication	Annual review of performance	Problem resolution	Equity	Mutual trust	Conflict resolution
Mutual objectives	Group working	Workshops	Commitment	Mutual goals and objectives	Long term commitment	Faith
Timely responsiveness	Common goals	Continuous evaluation	Continuous evaluation	Implementation	Coordination	
Trust	Problem solving	Mutual objectives	Group working	Joint process evaluation	Creativity	
Implementation		Problem resolution	Win-win philosophy	Dispute resolution process	Effective communication	
			Shared risk		Conflict resolution	
			Equity			
			Cooperation			

Appendix Two

Deborah Hughes

04137663@glam.ac.uk

Dear Sir or Madam

I am completing an MSc in Construction Project Management at the University of Glamorgan. My dissertation is about successful partnering through incentivisation. I was hoping that you would be kind enough to help me with this research by completing the attached questionnaire, which should only take 10 minutes.

Participants answering electronically should use an X to indicate a tick and underline the number of choice on the scales.

Participants will also receive the results of this survey. If you have any questions please feel free to E mail me at above address.

Thanking you in anticipation.

Deborah Hughes

P.S.

The completed questionnaires will be retained by the writer only until the course is completed. Numbers have been placed on top of the questionnaires so that only I know who has replied to the survey. No names of individuals will be used in the dissertation. The dissertation itself will only be held by the university.

Questionnaire

280134

Please complete all tick box questions and provide comments where applicable.

This year marks the 10th anniversary of Sir John Egan's report "Rethinking Construction". During a speech in May he stated "In summary, I guess if I were giving marks out of 10 after 10 years I'd probably only give the industry about 4 out of 10, and that's basically for trying". This questionnaire aims to examine partnering in light of this speech specifically examining if the correct use of incentivisation aids the achievement of successful partnering.

1. Please tick the appropriate box to indicate your involvement in the construction industry.

Client

☐

Cost Manager

☐

Contract Manager

☐

Project Manager

☐

Other

☐

Please state title

2. What is the total number of years you have worked within a partnering arrangement?

1 month - 1 Year

☐

1 -3 Years

☐

4 - 6 Years

☐

7 - 9 Years

☐

10+ Years

☐

3. In your opinion do you agree or disagree with three aspects of the following statement on how the construction industry can improve.

"I have to say that I would introduce, as early as possible in every possible project, a gain share between the client and the industry, with a target based upon an agreed set of parameters, plus or minus I would say 15%."

early as possible

Agree

☐

Disagree

☐

every project

Agree

☐

Disagree

☐

plus or minus 15%

Agree

☐

Disagree

☐

Why do you agree or disagree with this statement?

4. Listed below are a number of published key factors in establishing and maintaining an effective incentive scheme within a partnering arrangement.
Please can you number them 1 - 9 (10) in the order you think is most important.
(with 1 being the most important and 10 being the least)

Reliable Cost Data	
Clearly Defined Objectives	
Known Design Parameters	
Positive Attitude in Parties Involved	
Target Cost Set Early	
Level of Pain Gain Satisfactory for both Parties	
Mutual Objectives	
A Structural Risk Management Process	
The Correct Contractor	
Other (Please State)	

Please provide explanation if necessary.

5. Using the scale 1-7, please indicate how much you agree with the following statements
by circling. (1 = Agree a lot, 2 = Agree, 3 = Agree a little, 4 = Neutral, 5 = Disagree a little, 6 = Disagree and 7 = Disagree a lot)

- a. Setting the target cost early on in the project is essential.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- b. Partnering projects are successful without any incentives.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- c. Over the period of the partnering arrangement performance measurement data has provided for the establishment of accurate target costs.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- d. The use of incentives provides an alignment of objectives.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- e. The target cost must be realistic.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- f. The target cost is often set too high.

1	2	3	4	5	6	7
---	---	---	---	---	---	---

6. Listed below are a number of published key factors indicating that the project has been 'successful'.
Please can you number them 1 - 7 (8) in the order you think they are most important.
(with 1 being the most important and 8 being the least)

Project Brought in on Budget

Project Built to a High Quality

No Notifiable Accidents

Few Major Defects

Project on Schedule / Time

No Major Disputes

Team Spirit

Other (Please State)

--

Please provide explanation if necessary.

7. How many of the partnering projects you have been involved in would you consider to have been successful?

All

Most

Some

None

Appendix Three

Flow diagrams for use of statistical tests

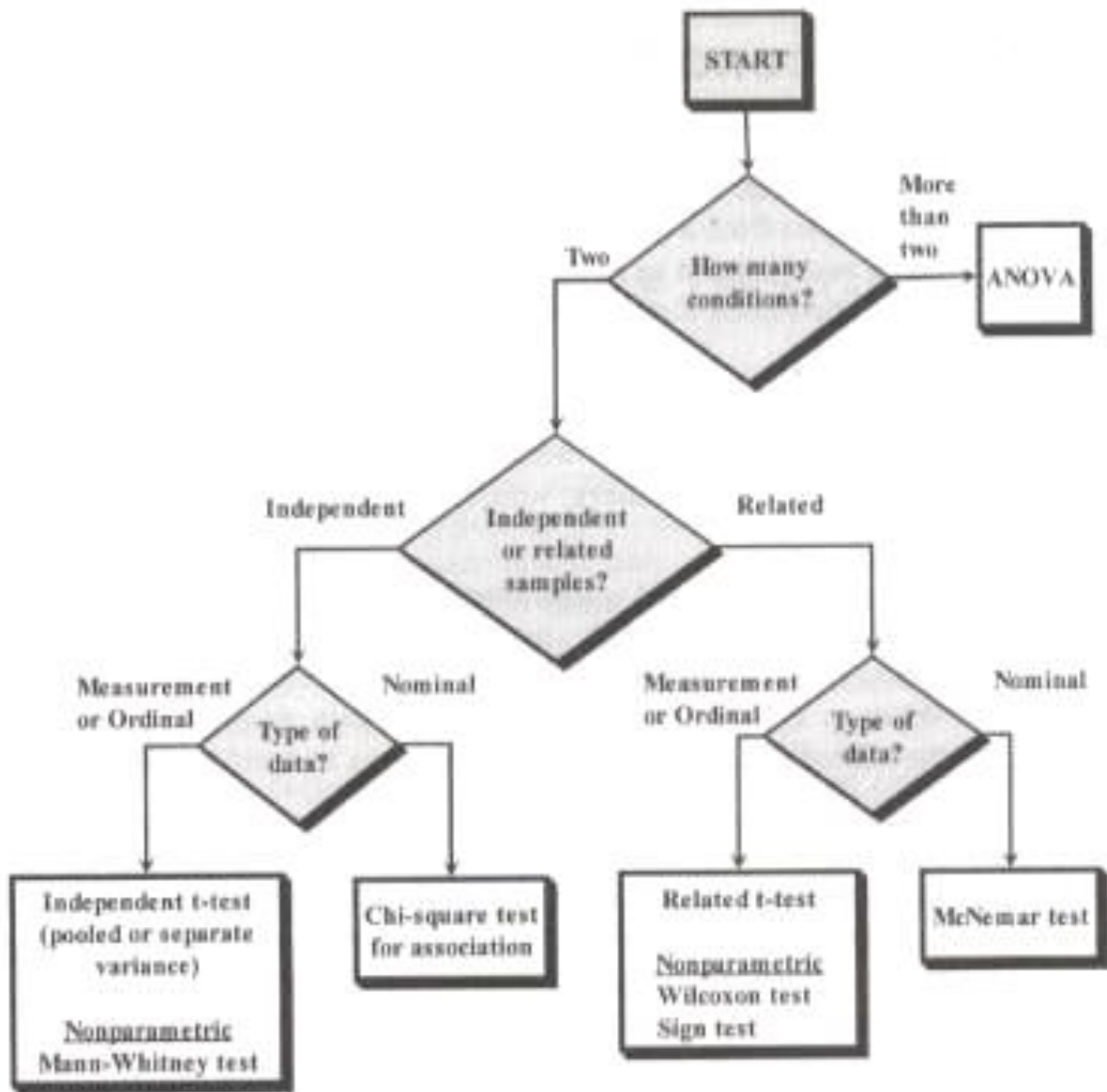


Figure 2. Flow-chart showing the selection of a suitable test for differences between averages.

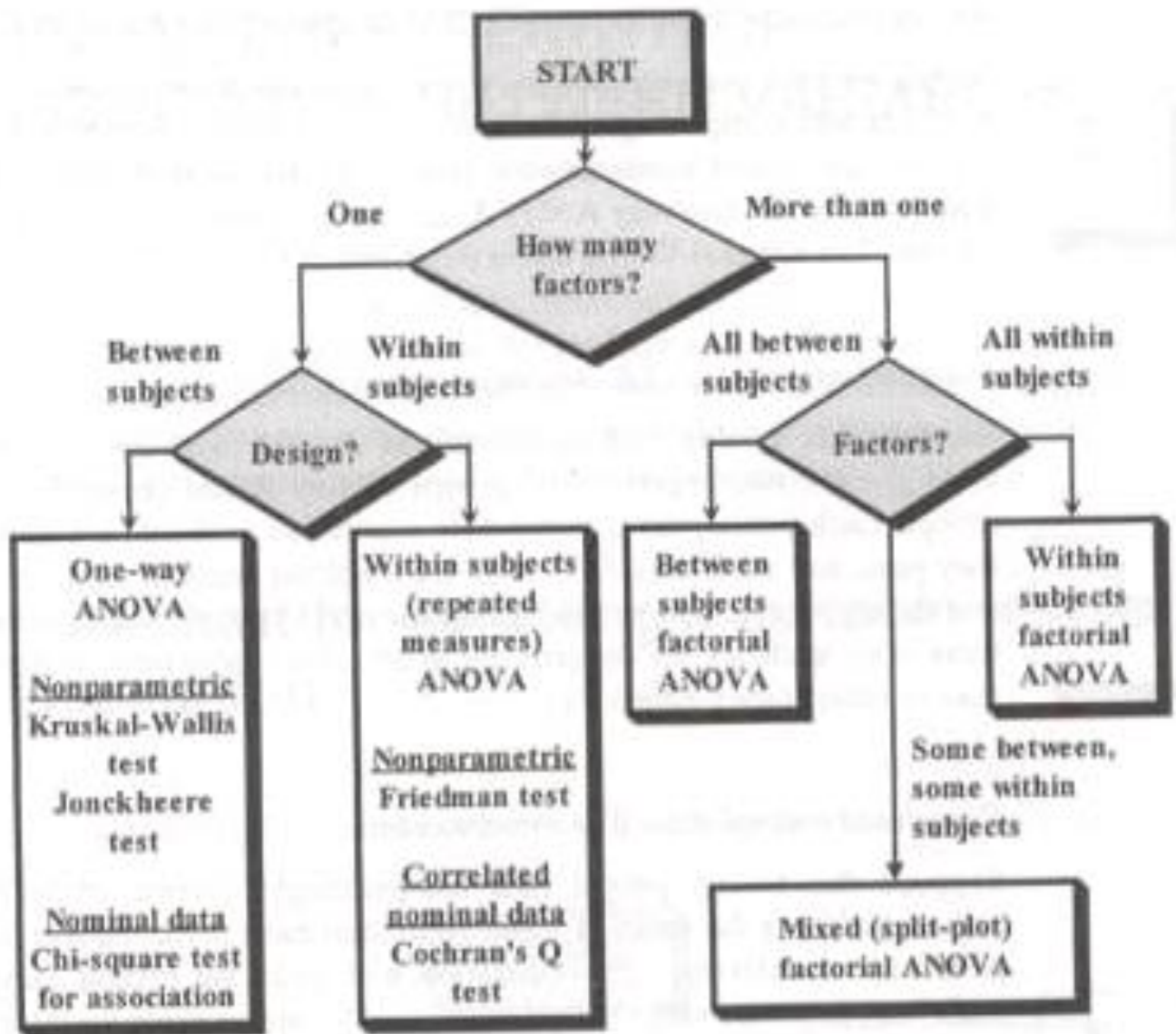


Figure 3. Flow-chart for ANOVA designs

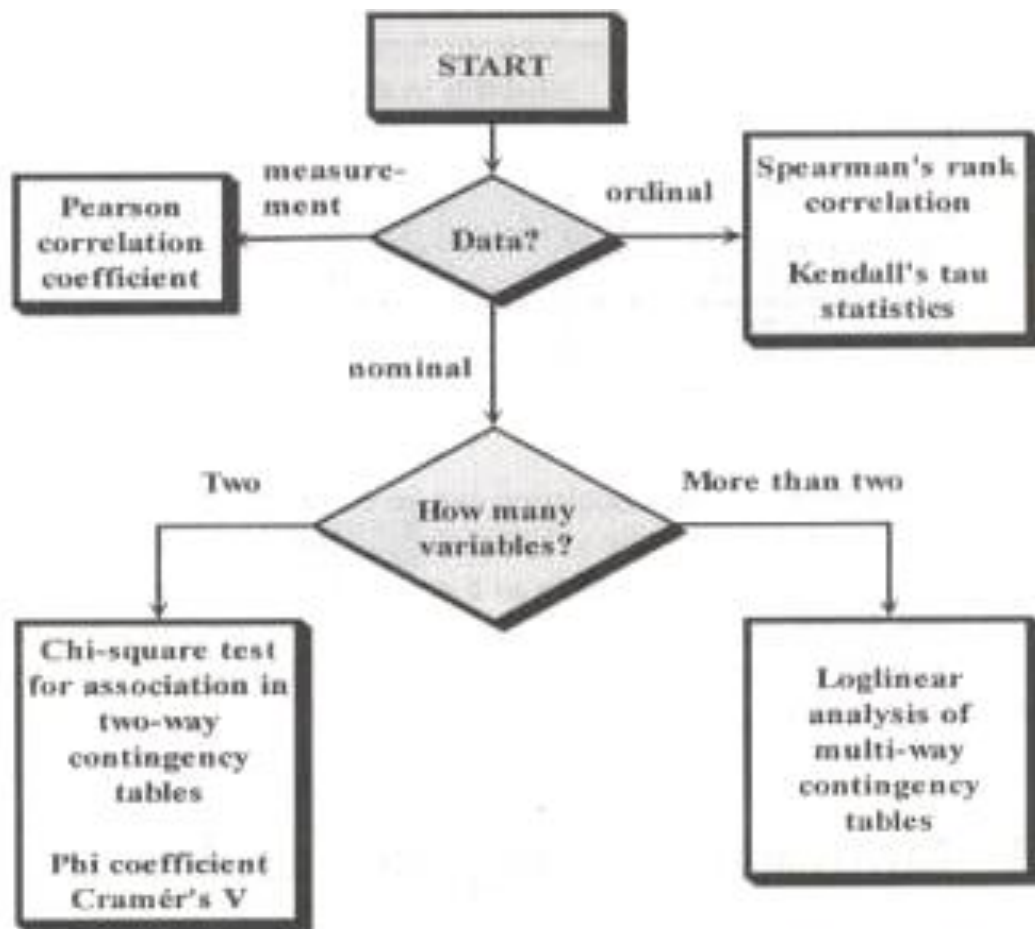


Figure 4. Flow-chart showing measures of association

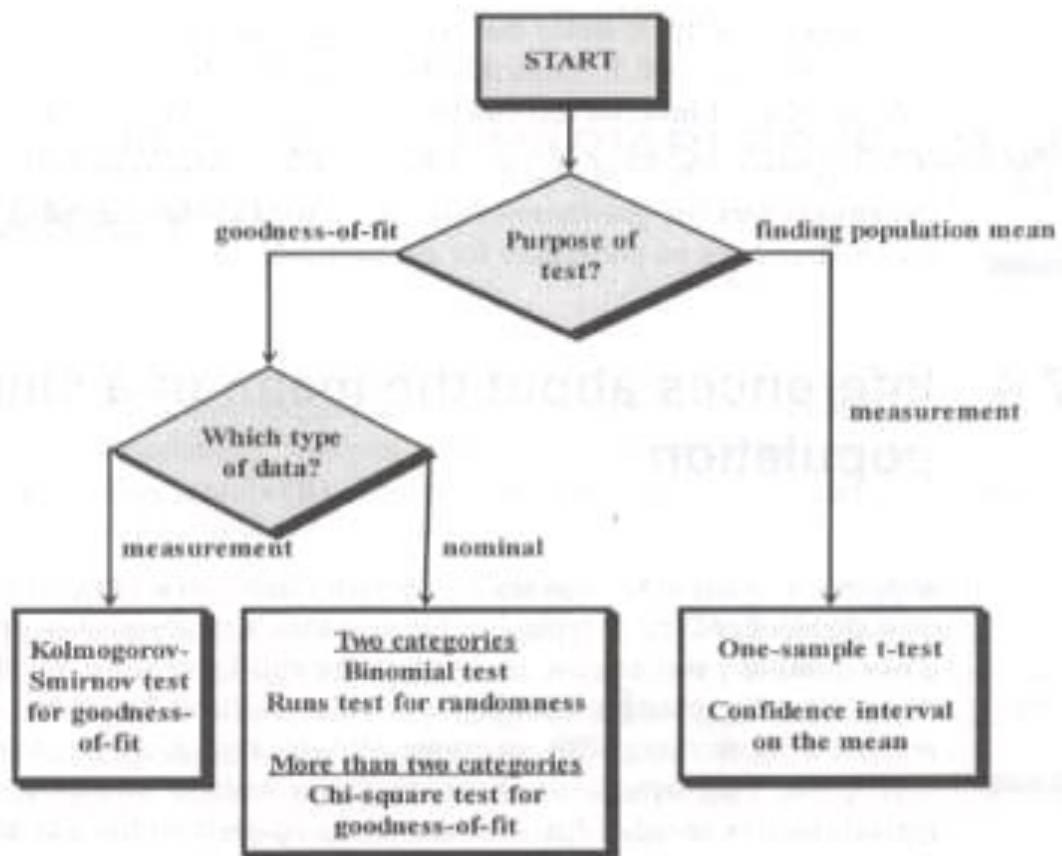


Figure 6. Flow-chart of one-sample tests

Taken from Kinnear and Gray (2000)

Appendix Four

Interview Questions

1. Egan used 15% for the gain-share pain-share. What do you feel about this?
2. Do you feel the percentages for pain and gain should be the same?
3. How do you feel this works?
4. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
5. How accurate do you feel the target costs are?
6. How are the target costs calculated?
7. When is the best time to set the target cost?
8. Why is this the case?
9. Does the use of incentives provide the quality required by the client?
10. Do incentives work?

Appendix Five

The following pages contain the raw questionnaire data.

		Q 1		Q 2		Q 3		Q 4								
ID	Project	Role	Experience	Early	Every	15%	Cost data	Objectives	Design	Attitude	Early	Pain gain	Mutual	Risk		Contractor
300969	Project A	Cost Manager	4-6 years	1	1	2	3	6	9	2	5	1	8	4		7
301171	Project A	Cost Manager	1-3 years	1	2	2	4	6	2	7	3	9	8	5		1
300868	Project A	Planner	1-3 years	1	2	2	8	5	4	3	6	1	2	7		9
300263	Project A	Client	10+ years	1	2	2	1	1	3	3	3	1	1	1		1
300767	Project A	Cost Manager	4-6 years	2	1	2	3	5	8	1	4	5	2	7		9
290260	Project B	Project Manager	10+ years	1	1	2	1	1	3	1	3	1	2	2		1
300160	Project B	Cost Manager	4-6 years	1	1	2	4	2	1	9	3	8	5	6		7
301070	Project A	Cost Manager	0-1	1	0	2	4	2	3	1	5	6	7	8		9
300565	Project A	Cost Manager	4-6 years	1	2	1	6	4	8	3	9	5	2	7		1
301272	Project A	Cost Manager	4-6 years	1	1	2	8	1	2	9	3	7	6	4		5
290161	Project B	Project Manager	1-3 years	2	2	2	9	2	3	6	1	5	7	4		8
290362	Project B	Project Manager	4-6 years	1	2	1	8	1	4	6	7	5	2	9		3
300464	Project A	Cost Manager	1-3 years	1	2	1	5	6	1	3	4	7	10	8		2
301474	Project A	Civil Designer	1-3 years	1	2	1	5	4	3	8	1	7	2	6		9
301575	Project A	Contract Manager	4-6 years	2	2	2	9	1	6	3	7	4	2	8		5
301676	Project A	Project Manager	7-9 years	1	1	2	5	4	6	2	8	3	1	7		9
301777	Project A	Contract Manager	4-6 years	1	2	2	5	1	1	6	8	7	2	3		4
301878	Project A	Proposals Manager	7-9 years	1	1	1	8	10	9	2	6	7	3	5		4
301979	Project A	Designer	7-9 years	1	1	2	9	1	8	4	10	6	3	2		7
302080	Project A	HSE Advisor	4-6 years	1	1	2	8	8	7	9	6	7	8	7		8
302282	Project A	Contract Manager	10+ years	1	1	1	8	9	4	5	3	7	1	2		6
302181	Project A	Cost Manager	1-3 years	1	1	2	1	1	1	1	3	1	1	5		1
302383	Project A	Quantity Surveyor	7-9 years	2	2	2	4	6	5	1	3	8	7	2		9
301373	Project A	Contract Manager	7-9 years	1	1	2	5	1	4	8	9	3	6	2		7
290564	Project B	Client	7-9 years	1	2	2	5	4	3	7	9	8	2	6		1
290665	Project B	Project Manager	7-9 years	1	2	1	8	6	3	2	10	9	7	5		1
290767	Project B	Estimator	1-3 years	1	2	1	1	1	3	3	3	3	3	3		2
290868	Project B	Project Manager	10+ years	2	1	1	2	5	1	4	8	7	8	3		6

	Q 5						Q 6									Q 7		
Other	a	b	c	d	e	f	Budget	Quality	Accidents	Defects	Time	Disputes	Team			Other		
0	2	6	4	4	1	4	1	2	6	5	3	4	7	0			Most	
0	3	5	4	2	1	4	1	2	4	6	3	5	7	0			Most	
0	2	3	4	4	2	4	3	1	5	4	2	7	6	0			Most	
0	3	6	1	1	1	3	1	1	1	1	1	3	2	0			Most	
0	2	5	5	3	2	2	2	3	1	4	5	7	6	0			Most	
1	3	5	4	2	2	1	3	1	1	1	2	3	3	2			Some	
0	1	6	6	2	1	1	1	3	5	4	2	7	6	0			Some	
0	4	7	2	0	5	2	2	1	6	3	4	5	7	0			Most	
0	3	3	4	4	1	3	1	4	5	6	2	3	7	0			All	
0	2	3	3	2	1	2	2	1	3	4	5	6	7	0			All	
0	3	6	4	3	1	1	1	2	5	7	3	4	6	0			None	
0	2	2	3	3	1	2	1	3	5	6	2	4	7	0			Most	
9	1	6	1	1	1	2	4	1	2	8	3	7	6	5			None	
0	2	4	3	2	3	4	2	4	1	5	3	6	7	0			Most	
0	1	7	5	5	2	1	2	4	1	5	3	6	7	8			Most	
0	4	2	1	3	1	4	5	3	1	2	4	7	6	0			Some	
0	4	6	7	6	2	7	5	3	1	2	4	6	7	0			All	
1	2	7	2	3	2	6	3	5	1	6	4	7	2	0			Most	
5	3	2	3	3	1	3	3	2	1	6	4	5	7	0			All	
0	2	4	3	0	0	2	6	7	8	6	6	6	7	0			Most	
0	2	4	5	3	3	5	2	3	1	4	5	7	6	0			Most	
0	5	1	1	2	1	1	1	1	1	1	1	1	1	0			None	
3	1	7	4	0	1	6	6	5	1	7	4	3	2	0			Most	
0	4	6	3	3	1	3	3	4	1	5	2	6	7	8			All	
0	5	5	2	6	7	4	2	1	4	5	3	6	7	0			Most	
4	6	6	5	2	1	6	0	0	0	0	0	0	0	0			Some	
1	2	6	4	6	2	3	1	3	1	1	1	3	3	0			Most	
0	3	6	4	5	1	6	2	3	1	5	4	8	6	0			Most	

Appendix Six

Questionnaire full answers.

Project A

301171– Cost Manager, 1-3 years

Question 3

Incentivisation. Every Individual project is different.

301070 – Cost Manager, 0-1 year

Question 3

15% is far too high. Pain Gain induces contractors to finesse their targets (which are not subject to deep scrutiny with the result that when they beat the target, and harvest the gain, one is left with the impression that they were not looking for best value to begin with. The incentive might be better than no incentive but it introduces a level of bureaucracy into the process, assessing the target, checking to see if it is reasonable etc. All very good for cost consultants certainly but it does produce some unintentional behaviour patterns.

300868 – Planner, 1-3 years

Question 3

Each job should be taken on its merit - gain share doesn't necessarily provide the best incentivisation mechanism. Whatever incentivisation is chosen should be decided upon early, however, in order to prepare for and manage the mechanism.

Question 6

This priority list will change order depending on the specific Project. Consider an Olympic Village which must be finished on time ahead of all other priorities, or a cathedral which would demand the highest quality of workmanship regardless of time and cost.

300565 – Cost Manager, 4-6 years

Question 3

On the basis that the partner(s) are in at the beginning the sooner they are involved the sooner they can influence for mutual benefit Some projects are not always suitable for incentivisation but usually these schemes are smaller in value and where the scope is more difficult to define

Question 4

Engaging with the 'correct' partner who shares the same vision is essential, if this is achieved the other points above will be worked out and agreed together. If you do not have the correct partner then you will not achieve the other items

Question 6

The client I work for is very deliver and H&S focused. However I have completed from a perhaps my own focus of cost management. In the environment I currently work in completion of schemes on time within budget is the key deliverable, the remainder of items are almost a given in terms of defect and dispute. Also Health and Safety has become a very focused area which leads back to engaging with the right contractor to start.

300263 – Client, 10+ years

Question 3

Not every project is suitable for Target Cost arrangements and not all contractors are capable of dealing with them, and so there remains a place in the market for traditional lump sum arrangements. The tolerance of +/- 15% is too general. I would regard 15% as the top end with 5% being a more acceptable outcome where the parties understand and have confidence in the arrangements and risk transfer. The contractor should have to work to achieve gain and there is always the risk that they will seek a "soft" target to enable gain to be taken without much effort to reduce costs.

Question 4

The need for good relationships based upon open transparent and honest processes and people is fundamental to success.

300767 – Cost Manager, 4-6 years

Question 3

Project A deliver hundreds of schemes in the year. In my opinion pain / gain for feasibility or design stage should be dealt with separately to individual schemes. Every scheme should be pain / gained once the design is 90 - 100% complete. 15% of what??? We deliver schemes each year ranging from £500 to £2million. One % for the industry will not work etc.

Question 4

1,2,3,4, all very close together

301373 – Contract Manager, 7-9 years

Question 3

The share range should be adjusted depending on the type of project, value and timescale. In most instances a tighter percentage band should be applied if the industry is to improve overall execution.

300969 – Cost Manager, 4-6 years

Question 6

In a partnering arrangement the budget the drive to reduce cost through incentives must mean that being below budget with an accurate target is a good identifier of the system working as it should do.

301272 – Cost Manager, 4-6 years

Question 3

I agree that the target cost needs to be set as early as possible to allow that project or scheme to start construction on schedule. I disagree that 15% should be set out as the pain/gain percentage for every project, the percentage should be variable depending on the size and nature of the project.

302383 – Quantity Surveyor, 7-9 years

Question 3

The contract should be awarded based on an agreed pain/gain mechanism, not "introduced" at some arbitrary time. Each project is different with varying risks, so not all contracts would benefit from pain/gain arrangements. It may be more cost effective for the client to go "lump sum". To incentivise the contractor you would have to go for a pain/gain split of around 50%. 15% is too low.

Question 6

Health and safety at top of any list – always. No disputes is a big time/money saver. For the contractor 'on time' means more profit usually. For the client, the priority is quality and no defects.

302181 – Project Manager / Cost Manager, 1-3 years

Question 3

Current pain/gain share at project A is on job below, business plan, is 50% pain 30% gain. Jobs over business plan; pain is 50% and gain 10%. Therefore on equal jobs the contractor is unable to make back losses on the next job. This promotes behaviours that are in the best interest of partnering. E.g. below business plan job, loss = £1, next job over business plan, job makes £1, contractor gets 10p. Therefore this job needs to make £5 to cover previous losses.

Question 4

KPI's need to be aligned. Contractor trust and honesty is absolutely critical.

302282 – Contract Manager, 10+ years

Question 3

The introduction of gain share early, enables the industry to provide, and share the benefit of expense early, before opportunity is lost. Every project, because of the requirement to provide consistency, who would know which to cherry pick? 15% is a reasonable percentage, perhaps needs to be a little higher if anything.

302080 – HSE Advisor, 4-6 years

Question 3

Figure to high +-5%.

301979 – Designer, 7-9 years

Question 3

It depends who has the biggest influence – Cost consultant or designer. Both can affect the target cost, thus affecting the margin. It also depends upon the clients, objectives, or quality of the finished product required.

301878 – Proposals Manager, 7-9 years

Question 3

Early as possible – By setting the incentivisation early in the project, all parties are tied into the development and delivery of the final scheme and outturn costs. Every project – If working as we do in project A, by being tied into the same agreement on each project, it means you have to take the good with the not so good. Plus or Minus 15% - This is a sensible figure that both incentivises and protects both the client and the partner.

Question 4

Trust and commitment – There must be a high level of trust and commitment between the client and the partner if the venture is to succeed.

Question 6

If the health and safety is of a high standard and the team spirit is high, all the other aspects of delivering a quality project on time and under budget are made easier.

301777 – Contract Manager, 4-6 years

Question 3

Some jobs too small to incentivise – proportionally higher contract admin. Share percentage needs to be at least 20% to affect additional risk to contractor.

301676 – Project Manager, 7-9 years

Question 3

Target cost, compiled from information available, the accuracy of the target cost is only as good as the info provided. Wouldn't apply a %, but it should be well within 15%.

Question 4

Common goals/objectives essential, to make partnering successful.

Question 6

Safety/quality/programme and cost all important when cooking for repeat work (all need to be maintained to a high/acceptable level).

301575 – Contract Manager, 4-6 years

Question 3

I don't agree that letting contracts is a cost effective method when using the target cost model. Too much time and effort is spent analysing costs and risks. This prolongs the tendering process dramatically and hence the overall programme. Inevitably these projects cost more.

Question 4

Trust is the key elements in partnering. Trusting relationships cannot be built overnight.

Question 6

Prompt handover signifies few if any minor hiccups or defects.

301474 – Civil Designer, 1-3 years

Question 3

Agree – for planning measures and cost control issues.

Disagree – cannot paint everything white in construction industry some things cannot be frogmarched.

300464 – Cost Manager, 1-3 years

Question 3

A – Both parties should be aware of early pain as soon as possible.

B – In my opinion partnering agreements are not value for money for the client.

C – 15% is a reasonable parameter.

Project B

300160 – Cost Manager / Project Manager, 4-6 years

Question 3

My experience suggests a larger percentage would be more effective.

290260 – Project Manager, 10+ years

Question 3

Early agreement of gain share is important, however the contractors enthusiasm for making money needs to be considered when agreeing the target cost.

Question 4

The correct contractor is important, however, the correct individuals are equally important and a early resolution of any disputes is required.

Question 6

Since the contractor is responsible for quality it is vital the contractor adheres to his written quality plan, not just fill in paperwork to conform to his quality system.

290161 – Project Manager, 1-3 years

Question 3

My experience of partnering is that :-

- Target costs are set high therefore no pain.
- Staffing levels are higher than traditional contracts.
- Consultants designs evolve as the project progresses.

Question 4

The key factors are:-

- Getting a comprehensive design 100% complete.
- Setting a target cost that is challenging.

290665 – Project Manager, 7-9 years

Question 3

The emphasis should be on reaching an equitable and measurable basis for incentives before committing to contract. The lead in time would not be justifiable for most small projects.

Question 4

The target cost must be a realistic expectation of the out-turn cost of the project and should not be inappropriately adjusted to meet a clients budgetary expectations. Getting the target cost right is more important than setting it early on in the project.

Question 6

All of the above items contribute to the success of a project the relative importance is not relevant.

290362 – Project Manager, 4-6 years

Question 3

Not every project would require pain / gain initiatives.

Incentives will help get buy in from all participants.

290564 – Client, 7-9 years

Question 3

Not suitable for all projects as there is a managerial cost. Small projects (unless part of a major framework) should use other forms of contract/procurement.

Question 4

Setting target cost early may not result in best value – either high cost with real and possible risks all priced or low cost with risks not addressed resulting in considerable debate.

Appendix Seven

Interview Transcripts

Project A

Interview Questions for 300565 – Cost Manager

11. Egan used 15% for the gain-share pain-share. What do you feel about this?
12. Do you feel the percentages for pain and gain should be the same?
13. How do you feel this works?
14. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
15. How accurate do you feel the target costs are?
16. How are the target costs calculated?
17. When is the best time to set the target cost?
18. Why is this the case?
19. Does the use of incentives provide the quality required by the client?
20. Do incentives work?

Reply

1. I think that to be honest, probably in terms of fully acknowledging that it was 15% or not I think that the gain pain share. Which I think was one of the subsequent questions, there's a lot of varied opinions as to whether it should be equal or not, without a doubt. Particularly we find with a lot of partnering contractors if the pain share is sort of twisted to be one larger pain share as opposed to gain share then it makes pricing a much more onerous or risky task.
2. So by keeping the percentage the same without a doubt it will make the partner feel as though they are in a better position in terms of what they may gain or what they may lose or what they may sort of lose.
3. Well it's we've, perhaps to elaborate a little bit more on that. If you have a got a gain share which is skewed in terms of say 50% gain share 10%. Sorry. 50% pain share 10% gain share you know the contractor or parties will say for everyone they lose they will need to the next 5 to win just to draw even. If it is a 50 / 50 sort of split, whatever the percentages are the well it can only be 50 / 50. Sorry. At least one

goes well and the other goes bad within 1-2 projects there is a chance to break even in the overall aggregate cumulative position.

4. No, I think whilst incentivising a project is good and it drives lots of behaviours into them. Sort of partners wanting to because there incentive is to make a little bit more in terms of the gain share at the end of the day you know the project needs to be set at the right level within the right scope, and a successful project is having the right product for the right value or the right price. Just bringing something in a little bit cheaper. Sometimes can drive behaviours of not necessarily cutting corners but getting slightly less of a product and although with sort of budgets tight in every environment you work in. Without a doubt or unfortunately one of the things we don't do enough of is look at the longer term in terms of life cycle costs. And say well if we can only spend another 5% on this we could, this project would last twice as long, kind of thing, or whatever. So you know I think the incentives are good they do assist in bringing in within budget but sometimes they can perhaps drive slightly the wrong behaviours in terms of, if you were drastically going over then obviously partners would much closer to see how they could pull it back.
5. Well theoretically we should say that target costs should always be accurate you know. I think if you enter into any partnering sort of ethos, environment you have got to set target costs which are challenging but can be beaten, because at the end of the day, we don't want any partner to suffer pain because that would drive the wrong behaviours for the subsequent projects and so on and the whole point of incentivisation is to set something or set a structure, a strategy where it is challenging but realistic and if something can be bettered that little bit more everyone takes a share in it, everyone wins. Back to the win win scenario. Yes for me in terms of improving target costs I would like to say everyone is pretty accurate but the nature of civils because it is in the ground obviously there are fluctuations and things do sort of vary. Somethings you see and somethings you don't its probably the nature of the industry but you know, for me it every contractor I have worked with I would like to think we could get them into a gain position, that only just, something up to 5% certainly not past otherwise without a doubt the proof of the is in the pudding in terms of the target cost is beyond the variance is beyond that then the target cost wasn't set realistically.
6. Well in terms of sort of business of respectives as a practice, different partners may approach it slightly differently, but ultimately its on first principles and I suppose it depends on the type of work that you do and the longevity of the programme. We've on the particular project that I am working on the particular project that I am working on now its been in existence for 5 maybe even 10 years in terms of the programme is 5 but there have been 2 programmes very similar. One following the other, and you would like to think that after a certain number of projects or a certain number of years you would be able to not just use first principles, whilst we would look at using first principles it should be informed by previous jobs and maybe we should be able to point to the longevity. After a few years we should be looking more so at a generic rate based on historic schemes and putting perhaps risk to achieving those generic

rates rather than always working from first principles the only option but you know to me in terms of the, if you are in for a reasonable period in terms of a programme of works you should be using much more, sort of standards sets of rates and component rates rather than always reinventing the wheel on every single new target that's the theory anyway. So there we go.

7. I think it depends on the type of job and we deal with quite a range of projects from sort of fairly basic pipe refurbishment projects which are very similar in terms of sort of methodologies obviously the locations will vary and that goes back a little bit to the previous question you may have a sort of fairly standard rate for refurbishing a pipe or relaying a pipe of a certain diameter or what will make the difference in rate will be its location and that will be the risk of achieving an output or not. In terms of the best time in setting the target. I suppose with that in mind you might with on pipe line schemes probably fairly sort of when the design is sort of 60 / 70 / 80% complete depending on the type of job, but there are other sort of process works we get involved with which can be in excess of 10 million and we quite often get to site, where the main sort of strategy of the processes is agreed but a lot of finer detail is not but on saying that the sort of key components are understood and how they are assembled and the latter bits of design probably don't alter that much in terms of the value so it really does depend on the type of work.
8. But without a doubt I think the earlier involvement with everything is probably the better and if that can mean the target is set that little bit earlier then there is some advantages as well because obviously it means that everyone is striving much more to a point to make those improvements.
9. Well I think some of the key things for me are that that the incentivisation only works if you start the thing off properly in terms of you get the right partners on board you have the right programme for the partners to work on and the two sort of fit together inevitably lots of clients in terms of the framework partnering sort of agreements they tend to be more utility type and larger sort of organisations where they probably have certainly in utilities standard details, standard qualities and directives in terms of environment agency or the drinking water inspectorate and so on and so forth, so the fact the quality is always predetermined in terms of set standards of hygiene and quality assurance and so on. So I am not sure how those two really link for me and I think that if you have got a client who has certain standards he brings in contractors and has automatic standards that need to be set so incentivisation in a way is something that is a bolt on to doing a little bit better and beyond those parameters already set. However at the end of the day, I think if you have got the right people on board if you have got those standards set you can still incentivise and you can still drive, shall we say cheaper or better value products but obviously that fits with the client but its about getting it set upright and getting the right people and the right structures in place.
10. Well I suppose I have kind of part touched on that from the previous question incentives without a doubt do work. They incentivise people to

do better than they would originally predict it goes back to you know if the target is set properly and you have the right people in place incentives are inevitably going to drive behaviours that and improvements to slightly better profit margins or sort of give make the client feel he is getting a better deal himself is perhaps providing a good business case for continuity with that partner for that client in the future quite often you sometimes do talk to partners that say that the incentive is whilst it is a bonus it does not necessarily always work because. It depends how it is set up I suppose there are different types of incentives whether it is specific to a job worth a million or a overall programme in terms of completions on time and finishes so I mean I suppose they do work as long as they are set up properly and the real drivers of the client we understood. You know whether it is going back to sort of governments deadlines in terms of finishing stages at certain times whether it is more retail its about finishing various stages at certain points for openings and the likes, so it depends how you set it up you can perhaps get into much into a point where you miss the more strategic wider picture. So it is making sure you set it right so it achieves everyone's objectives rather than just making a few pounds against a few stages may not keep the wider picture on the horizon so well.

Interview Questions for 300464 – Cost Manager

1. Egan used 15% for the gain-share pain-share. You suggested using different percentages for pain and gain, do you feel this works?
2. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
3. How accurate do you feel the target costs are?
4. How are the target costs calculated?
5. When is the best time to set the target cost?
6. Why is this the case?
7. Does the use of incentives provide the quality required by the client?
8. Do incentives work?

Reply

1. Yes I think it's a reasonable you know each job is different obviously. But I think that's a reasonable percentage overall. I can only say that each job is different, different risks.
2. Yes, I can not see anything wrong with that, no.
3. Yes as long as it is brought in without too much value engineering to the detriment of the contract and the guidelines.

4. I can only speak on this project A works and the last year we have tightened up and I think we have a better method of calculating them so I think they are accurate, yes. Well it runs a little bit with three the last year we seem to have tripped down and got on the same mind set for taking off and calculating it. So basically on a measurer value taking off from the drawings and output compared to the programme and myself and the contractors estimators acknowledge that there outputs are reasonable and accurate.
5. On completion of a reasonable set of target cost drawings. Construction drawings sometimes we have tackled projects early doors, when its just a couple of bits of lines on a piece of paper like a scheme deficit thing.
6. I think its ok for an idea but you need an accurate set of target costs/ construction drawings to know to give a fair evaluation.
7. Yes although sometimes I am concerned in that the contractors are left to their own resources i.e. there is nobody from the clients side supervising the work. I think human nature says you cut corners and time will only tell about the quality. You know if you get failures a few years down the line time will tell. But I think there is nothing wrong with giving people an incentive, its human nature, is good but sometimes I feel the client should have some sort of representative there just to check the quality of the work. As I said, nothing wrong with incentives give a dog a bone and give them bonuses to get it done but sometimes when they are not being supervised there is a danger then of corners being cut out and time alone will tell if the product is not up to the required standard.
8. Yes, Yes, definitely if a company knows that we have to get stuck in and complete this project early and we will make money rather than a manyana culture of oh well we gat paid anyway. I think everyone gets you know, with an incentive but I would like to see a representative from the client Project A managing the work.

Interview Questions for 302181 – Project Manager / Cost Manager

1. Egan used 15% for the gain-share pain-share. You suggested a using different percentages for pain and gain, do you feel this works?
2. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
3. How accurate do you feel the target costs are?
4. How are the target costs calculated?
5. When is the best time to set the target cost?
6. Why is this the case?
7. Does the use of incentives provide the quality required by the client?
8. Do incentives work?

Reply

1. Right. I would be non-committal on what the percentage should be. The problem we are finding when we are actually working in option C than is that the payment mechanism we are working with, kind of ... I don't know if you have seen my explanation. See I spoke of pain gain its an imbalance essentially if Project A set a business plan up and if we set the target cost value the pain gain is 10% on any profit and 50% of any loss and when you work through those maths through, if you, if a lot of your jobs are over business plan and I am not being project A set this. If you lost a pound on a theoretical job you will pay 50p but next 5 jobs or the next job which Business plan you need that job to make £5 profit just to square the books up. To cover your 50p loss, now that's like a cancer in the system. People, senior management don't recognise it, but if you make your pound back, not to make more money you have to have made 500% on the next target cost and therefore makes the commercial managers role which is supposed to be independent, very hard because people, quite understandably need to cover So perhaps I'll be non-committal on 15% of the gain , it is more of a fundamental question of fairness. So if it was 10% split or 15% it is how the contractor can make that money back on the next job, so if he has got 15% shares of the gains he should only pay 15% of the losses and therefore any 2 projects can balance themselves out and its equal then for the client as well you know. I don't know if that kind of answers.
2. Yes it does but we need to understand how it has been brought in below budget to say it has been successful, the contractors here are very aware of design development and what happens is, when we set the target costs people, rather come up to see the drawings target, do we really need that or can we Use their imagination. They stand back and be quiet. As soon as they start on site, then they bring those questions up. Ok, so they challenge late because essentially there is a financial reward by staying silent so it should be that the project is successful but human nature has a canny knack of looking for opportunity completely against the ethos of partnering, but that's what we are having but in answer to that it should be successful. But obviously you need to be aware of what I ma putting across. There are pitfalls there that not necessarily quite, quite right.
3. Well being honest with you, not very now when you say how accurate, with market rates? Not very again also with the Project A situation, Project A does not have any one out there making sure the quality of the work is right and that they are doing exactly they are and not cutting corners we know there is a lot of cutting corners going on out there and we know that there is not very very very and generally it does not matter how fat the target is they tend to spend right up to that target, which seems to be the real world prices we are somewhat inflated now this is supposedly a benefit we have to pay a bit more because of the better to be honest with you I think the prices are over.
4. We set the target at 70% design. Now how do you measure what 70% design is, is beyond me. But that's the kind of thing. I don't think it is the

best thing to do in terms of financial because obviously the other 30% could tie the contractor down to costs that extra 30%. I think is a lot of financial cost to the contractor. Which he is contracted to do for the price he has set and their problem is the tendency than is the contractor has got to cut costs so personally I don't think setting early is the right way and then you have got more scope for it, it directly affects how accurate the target costs are because then you make real broad assumptions, which then prove to be completely wrong, what assumptions, it could make a lot of money one way it could lose a lot of money the other way and then what

5. I don't think so. The problem we have in Project A as I have said before complicates things really the contractor.... The quality is not that hot, if the most important thing one issue you have not picked up on yet is trust and honesty. If you haven't got that it doesn't matter, its absolute. We are in an absolute nightmare because of this sort of problem. There is no trust there is no honesty and openness. Therefore for example we can't get accurate costs. We have made it ever so easy to report it we can not get actual costs back they are not open. As I said it goes back to point 1 or 2 where we said about not being honest with target costs. We don't need it. Its not the right way and therefore it becomes a cancer in the system and it bogs the system down. The system stops everyone is looking where am I being caught this time. You know, and if you don't set that, and I think the trust, openness and honesty is a derivative of the pain gain mechanism because people are having, if they have lost 10 thousand pound on a job the next one below business plan, that needs to be 50 thousand pound over and therefore all the system fails breaks down totally and that what I think is the problem with incentives.
6. Yes in practice. Yes but again 7% now they obviously believe that 7% is not enough therefore they want to make more money they swap through faster better so. They should work but it goes back to what is your game plan. You may have said you have a certain game plan but what on earth. We have had major changes in the last 2 or 3 months. One director has been got rid of there's a new director in. Who is hoping that, as a team we all have common goals common goals again another major problem are contractors here don't see that our primary aim is Project A success. If we succeed in Project A we are reaching their objectives then by default we will than have met our objectives and made our money but the correlation, that sight on the objective is totally lost so therefore the contractor they want to make money they have got to make money at the expense of project A, and there is this belief that they make a sale over 10 thousand then project A gets 7 thousand pound back well no if you had put that 10 thousand in the first place then project A 10 thousand pound bank anyway. It's a warped view of the world. Incentives should work I think it comes down to this having everyone having common goals, means the client to have needs to have the incentivisation model. It needs to be a fair one so that if I lose one job I can break even on the next if that inbalance is there your incentivisation really is going to be a damage limitation. How do I square the books? You know that really is. If you go away with nothing else the client has to be fair, but unfortunately I think even though we try to to say that this partnering if the way the incentivisation models were set, up is not a fair incentivisation model so have always seen themselves

bottom line. We are all in this together but when the shit hits the fan its your contract. You know. And that's not good for business it is very naïve.

Interview Questions for 302484 - Contractor

1. Egan used 15% for the gain-share pain-share. Do you feel this works and why?
2. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
3. How accurate do you feel the target costs are?
4. How are the target costs calculated?
5. When is the best time to set the target cost?
6. Why is this the case?
7. Does the use of incentives provide the quality required by the client?
8. Do incentives work?

Reply

1. It depends in what context it is being used. If you have got accurate target costs to start with then I think that it will work. If there is no slack in it no float in the target cost then it could be unfair.
2. If the budget is realistic to start with and you can value engineer and find savings then perhaps you can go in and doing things, then yes the project could be successful, or it could be that they were to generous in the first place and it wasn't a challenge to achieve it so it will still be classed as successful but achieved the easy way.
3. At the moment we go to target costs when the designers feel they have achieved 75% of the design and I put the emphasis on feel. Ok. My feeling of 75% and their feeling of 75% complete may be two entirely different things. I don't believe we allow for that enough in our risk registers for the fact there of, depends on the size of the scheme. We are either 1% of the construction costs for design at the moment or 2%. But if you only get the target at 75% design surely it should be a higher percentage than 1-2%. So, I/my concern so far is that they are not very accurate. Struggling to get close it.
4. Um. They are based on past experience. So, we have done a similar scheme for that that's what it cost us that's what this should cost or they are priced individually based on the information given at the time, which is the target cost. Which as I say is 75% design. Could have somebody saying we have see this hole in the ground here its 4 meters by 4 meters by 3 meters deep that's all we know at the moment.

5. Personally from a quantity surveyors point of view. I think it should be 100% design and you know exactly what you are building. But that is personal, but before the contract starts obviously.
6. Because every scheme I have done so far has lost money. Because designs change as we have gone along, and what we thought was a structure 14 meters by 3 meters turns out to be a structure 20 meters by 4 meters and yet you set your target cost based on
7. Yes. I don't see an issue with quality at the end of the day we are here to provide a quality product. Quality costs if you have got a reasonably tight cost you should be able to achieve the quality required and still hopefully come up with an inventive layout/framework.
8. I feel they can work in my experience to date as this is the first contract I have worked on with incentives it's not working for us as a partner contractor. We are not able to achieve the target and when we value engineer we are criticised for doing so. See. We have been told by cost managers "oh, you are ripping me off again!". It is not helpful but unfortunately what is happening in this particular environment and it's not motivational, makes you think well hang on, can't build that so it de-incentivises everything then, so. But in principle if it's a good system, it can work. The difference is in how it works here with your below business plan or above business plan incentivisation changes, but yeah, over all I think it could work but not on this contract.

Project B

Interview Questions for 300160 – Cost Manager / Project Manager

1. Egan used 15% for the gain-share pain-share. You suggested a larger percentage, why do you feel this?
2. Should the gain-share percentage and the pain-share percentage be the same figure?
3. What advantage do you see in this?
4. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
5. How accurate do you feel the target costs are?
6. How are the target costs calculated?
7. When is the best time to set the target cost?
8. Why is this the case?
9. Does the use of incentives provide the quality required by the client?
10. Do incentives work?

Reply

1. I think with the contractor the advantage of having a larger percentage is that it gives them a greater incentive to perform and also they are facing a larger penalty if they don't perform the one proviso that I would put in on this is that the target cost has got to be as accurate as possible if the target cost is not accurate then the percentage does not really matter.

2. I think so I think it ought to be fair that you carry an equal share of the losses and they will equally get the same share of the profits.
3. I think it is fairness, yes, in the system to try to put in place. That it is seen to be equitable.
4. Depends on how you measure success obviously incentives have a financial focus, so you are basing it mainly on cost if a project comes in very late or the quality is very poor than you may not judge it to be successful even though the cost is within budget.
5. The target costs are not accurate, one of the reasons why target costs on project B were not accurate was that they were arrived at too late a date the contractor had incurred certain problems and he then sort to incorporate those problems within the target cost and delayed and delayed the establishment of an agreed target cost.
6. The target costs were worked out on the basis of estimated figures.
7. The design admittedly was not very advanced at the commencement of the project and there were continual design changes which really was a problem with establishing a target cost.
8. It has got to be as early as possible the contractor is generally in a position to know how a project is going, he is in a better position, quite often than the client the longer you leave the establishment of the target cost the less fairness there is then in allowing the client to benefit from any pain the contractor may be incurring. The contractor quite often when a project starts go wrong go wrong will tend to spin out the period by which he is prepared to agree a target cost thereby trying to incorporate a lot of the potential pain the projects incurring.
9. I don't think it's necessarily going to provide poor quality but obviously with the focus on cost there is a danger that quality could suffer.
10. I think they can work. I don't say that they always work but I think that I would prefer to see incentives in place than not have incentives in a partnering contract.

Interview Questions for 290564 - Client

1. Egan used 15% for the gain-share pain-share. You agreed with this percentage, why do you feel this?
2. Should the gain-share percentage and the pain-share percentage be the same figure?
3. What advantage do you see in this?
4. Incentives are said to encourage the project to be brought in below budget. Does this mean the project is successful?
5. How accurate do you feel the target costs are?
6. How are the target costs calculated?
7. When is the best time to set the target cost?
8. Why is this the case?
9. Does the use of incentives provide the quality required by the client?

10. Do incentives work?

Reply

1. We have got plus to minus 20 on a sliding scale and then more than +20 totally down to the contractor or developer and if its more than -20 its totally down to us as well because its 2 ways isn't it, you don't want the contractor or developer to drive down costs artificially because I am after the quality of the product hence the way I have responded to the questionnaire. In the early setting of the target cost I don't see as a high priority. People would see that I would probably set/have an indicative cost in mind so the contractor and his team well the whole sort of well the whole group in actual fact are not going down a route, without some guidance without some idea of where they are trying to get to but are actually trying to hit a figure early on is the classic sequence isn't it, if it is pitched too low oh dear think you are going to be in for a couple of disputes along the line, ok you are going to get the contractor or developer trying to have, yes claim under the contract there so many events that have to be covered they will be trying to drive the target cost up in any case and likewise if the target cost is set and its too high than the client has no way of recovery. So all risks real and imaginary are in there and there is no way back because oh yes, you will save some money, but you are sharing the saving against what is termed a predacious cost in the first place. So I am not a fan of this early bit + or - 15 is ok.
2. Not necessarily it tends to be with most contracts I must admit its got this incredible sliding scale, haven't you basically is it 50-50, is it 70-30 is it 60-40 whatever whether its plus or minus the initial sort of 5 or 10% the other tends to be a 50-50% arrangement.
3. Its what happens next because some clients will actually only have say +10% so its 50-50 up to 10% and then it becomes 100% on the contractor so its yeah quite reasonable because after all you are working together, you shouldn't be in a game of trying to win win on the thing it should actually be shared because that is the whole purpose of the partnering so its you need to understand it do the outset. I have run a number of contracts without that actually being part of the initial tendering process either because the actual percentage of it is something to be looked at later on.
4. Not necessarily below budget ok lets go back to the old days. How many projects based on lowest price (sort of) I don't know were covered by the initial tender figure in other words the final account was within budget? Not many. How many were completed within the agreed program period? Not many. So lets go outside that a minute I don't know about bringing it in. Brought into the budget certainly, yes, everyone knows where they stand I mean there is the contractor or developer may like to bring certain things in because he is sharing cost I accept that but it is still a partnering arrangement because if it means that its bringing in the product or standards are different the answer is it doesn't for me. Because I prefer I must admit a quality a quality product

on time and within the target. Ok the target could be 2% or 5%. I don't think it really matter preferably not above 10%.

5. Well depends where you want to play it. Some people run contracts where they have actually issued like an approximate bill of quantities to start off with to try to get some indicative figure at the start. Yeah, we did that for one about ten years ago. I think they are slightly variable in actual fact. On this, I mean, they should be a realistic figure. I mean we probably don't fix the target. I like the target fixed when probably we have got about 70% of the packages bid. Alright, we ran a number of projects a few years ago using NEC option N, which is the management and basically the way that was set up was the budget was like X pounds per square footage you are building. Are you going to tell me? Because it was a blank sheet of paper. First of all some people had difficulty trying to come to terms with that to start off with and understand it because I think they came with the view, expecting a bit of the old fashioned, here's the design or at least here's the plan or something or other. And it was a rd line around the site. Obviously I didn't want to put in a ten storey office block, I had some idea but it was as flexible as that. And we proceeded on the basis of doing the designs and so on, but we didn't commit to doing the contract, the actual construction of the contract until we had a 70% certainty. So, I would think that probably the... yeah, I think in that instance they should be fairly accurate. If you had most of the package already tendered, I don't say you go to 100% because that's insane, that's just slowing the whole process down but again you wouldn't actually proceed if you did or you were forced to proceed because of time scale issues, occupation access and all sorts of things that they proceed with, with a contract that only has a few packages tendered/bid then the greater the risk. I wouldn't do that and I am quite comfortable with 70%.
6. Yes, it should be, that looking what the scheme and the potential risks are and all the implications are. I mean its, yeah, the risks are key you know, the time of year you are doing it, the what the information on site. The biggest risks tend to be in the ground or the environmental issues and everything else. So those are the ones to really sort of enter first if you like, if you like to put it that way because when the building or a building or structure or something is not involved then it can be civils, civils is a little trickier because most of it is underground, but its that level amount of risk so its back to that how can you reduce the risk, you can never eliminate them but it's the normal risk register where you are trying to knock them off. So you have to build some of those in, the contractor or developer certainly will want to build those in any case. He will not want to contribute to what is like a penalty almost, on something when it should have been picked up as a potential risk with a cost allocation to it in any case. We tend to use external consultants, cost consultants, quantity surveyors but yeah working with the contractors. Obviously so it is a very open procedure that when we have done them to try to build up a figure not Mr contractor throws, or Mr developer throws you a cost and says what do you think. I mean there is a bit of discipline involved. You are looking at life cycle costs of products on occasions may be fine if your budget is up the creek. Really stretched but if maintenance is an issue, if replacement is a problem it should be

built in for the whole of, the private sector has been doing it for a while but the public sector is trying to get best value back a bit and lowest costs but sorry it should build in the life cycle costs of the whole exercise.

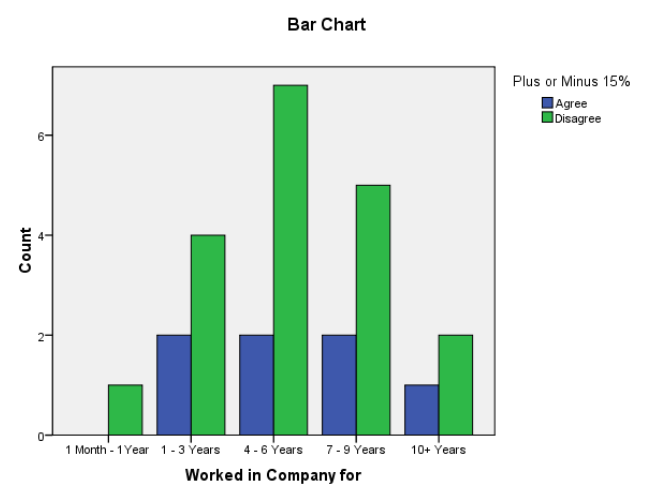
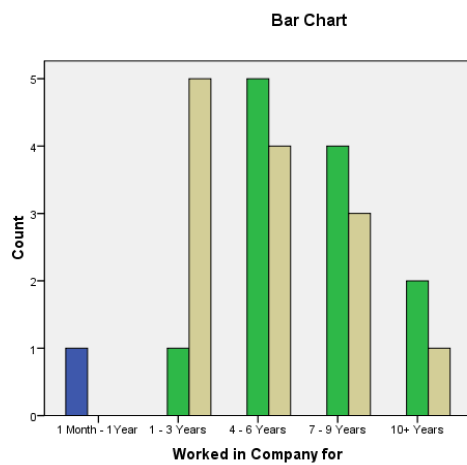
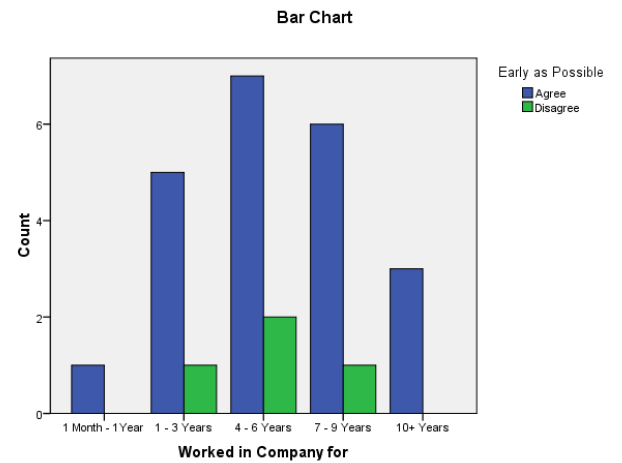
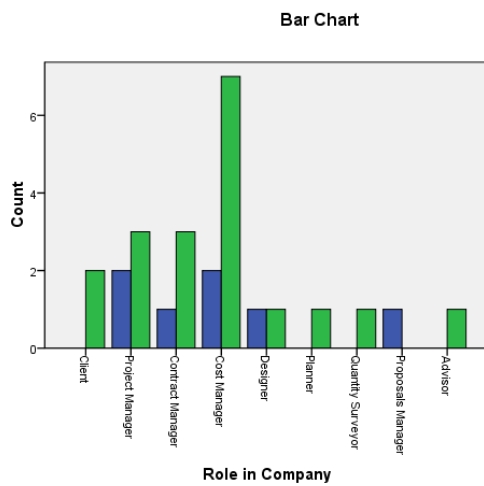
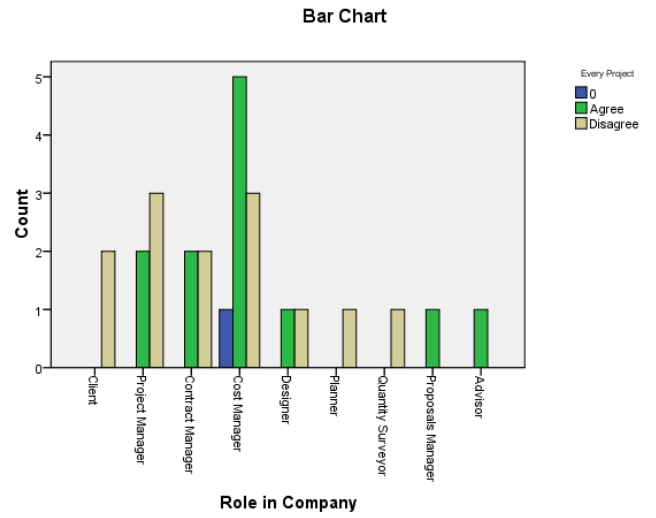
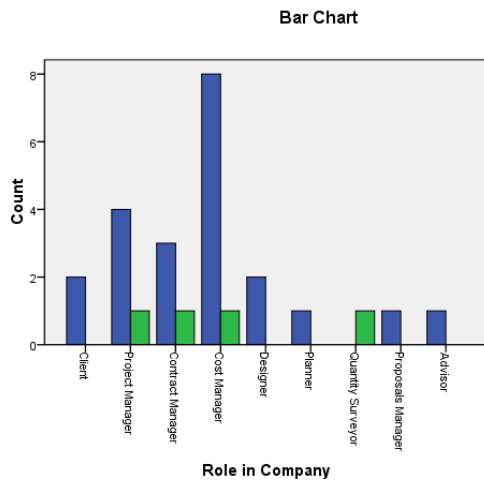
7. When you got the risks and identified most of them may not all cause you can never, it's a classic "do you know what you don't know?" The answer is you don't. I mean you will always have a few bits and pieces that cause a problem but I would expect that 70% at that sort of level whether it is 68 is it 73 oh come on it depends on what the packages are. If the packages are..... If the major relevant ones are done and they amount to only 60% and you are into finishes and whatever and well that's different. I am not too worried about that but its sort of 70%.
8. Its normally a number of months on frankly when we have bid projects on the basis of management cost profit overheads on the whole and then made the selection the target cost may actually be 4, 5 possibly 6 months later, so I have got no illusions of the team. The project managers it is not a case of try to set this we have to do this in the next 6 weeks. If we are trying to set the target within the 6 weeks, somebody is going to lose and it's a toss of the coin as to which one, but somebody is going to.
9. Not always. It's a slight problem. Its choose your contractor on this isn't it. Providing that it is explained at the outset what this is the clear bit its got to be, it's the brief, and its got to be the client and his representative it has to be specified at the tender stage if not before the contract design bit of it is awarded because otherwise there could be with certain teams, yeah, incentive to drive things down which could affect the quality. I will admit for some products probably not quite so relevant but the end of the day because some of the things you can't actually see or feel in that sense and ok but in other which would affect weather resistance or even just wear and tear you are going to have to look at that back in the lifecycle bit so its got to be right at the start. And for us for example at the moment its, if we get involved in buildings if its not domestic there is BREAM (Are you aware of the BREAM scoring system?). BREAM is excellent we have to obtain excellent on that remit, we issue. We have been doing it for years actually. Before the requirement from the Welsh Assembly came in and that means if it is direct billed we sell the land for development or put grants in and it is domestic it's a minimum of code level 3 but again if we have control or what ever we will try to target a code level 4 or we are doing some pilot projects at the moment where we are trying to go to code level 5, so those are our sort of actual requirements. Now those, the new BREAM relates a lot of the new things because zero carbon aspirations (its target not a requirement) trying to get energy efficiency reduction in carbon dioxide, trying to get renewables in. So you are really looking at what the quality of the building is because if you are going down a zero carbon house for example the air infiltration. There isn't much so 3 tonne of silicon filling all the cracks and crannies is not an option, is not an answer. So quality is pretty key to this and we need to drive quality up for a number of years there has to be this balance and partnering is meant to actually. Does it mean you are actually increasing the cost of the project?

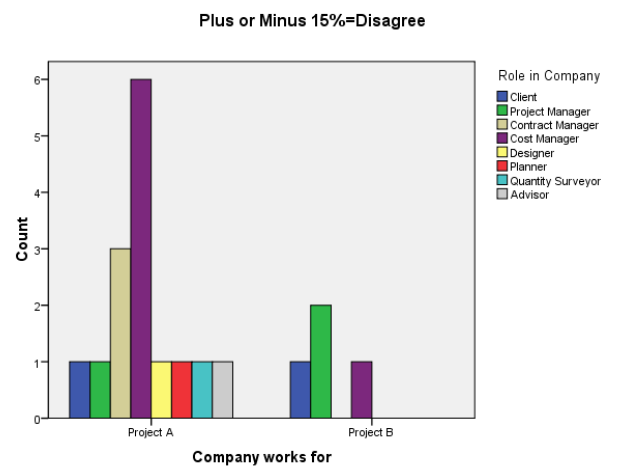
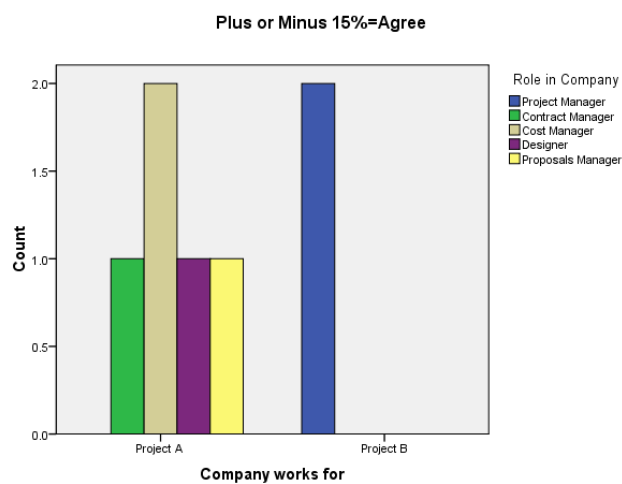
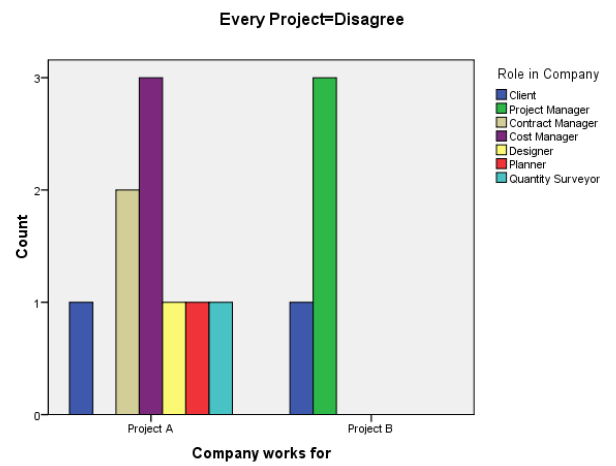
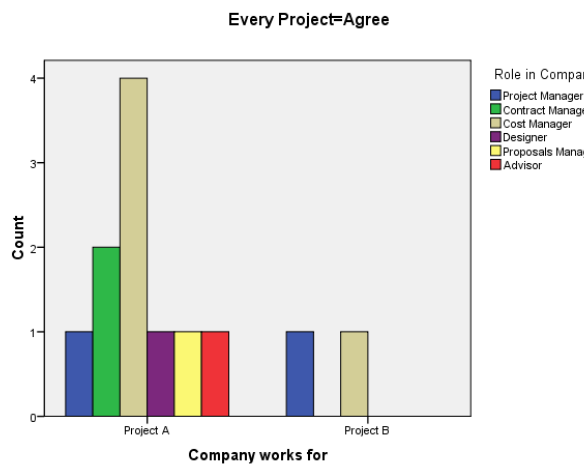
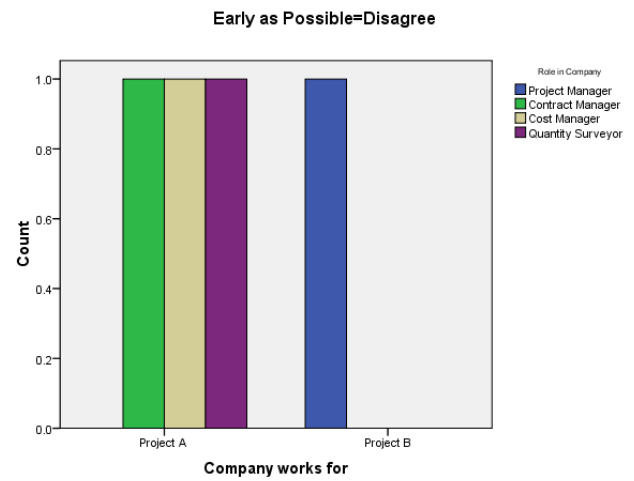
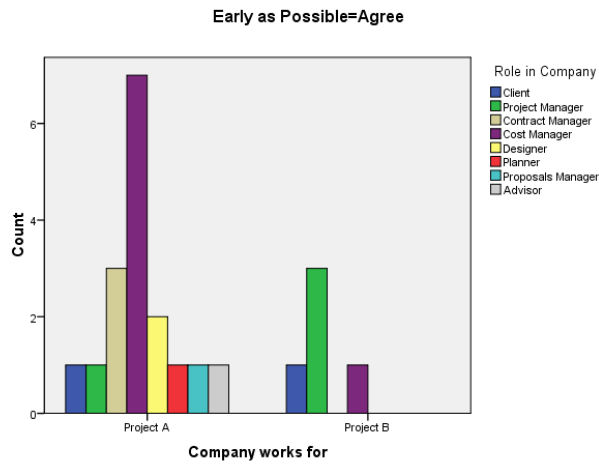
Possibly, but are you increasing it for the right reason? And if you are increasing it for the reason of life cycle costs, yes than that's quite justifiable.

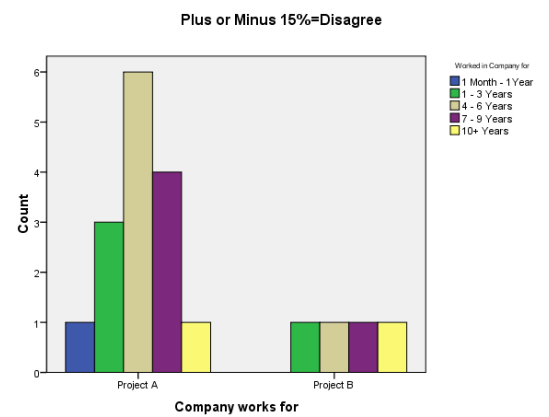
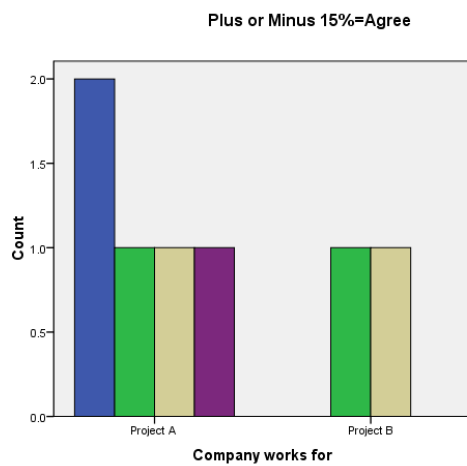
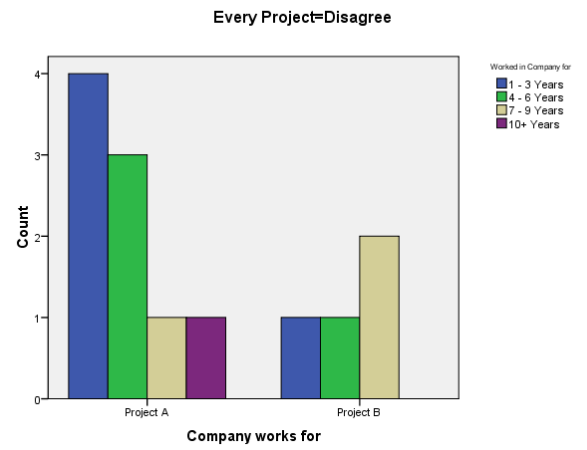
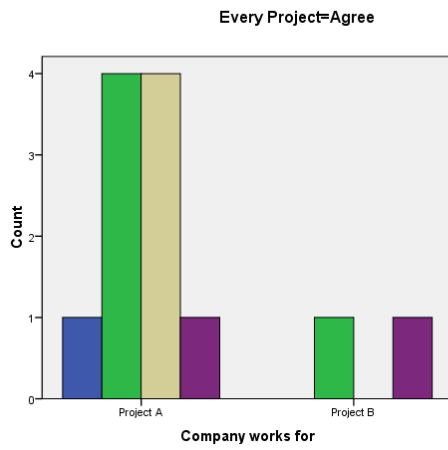
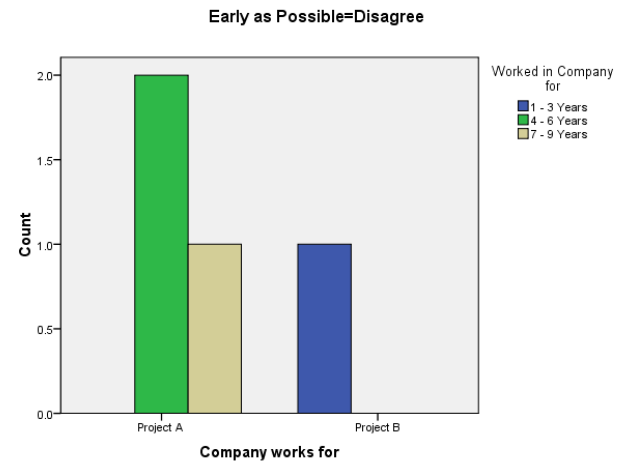
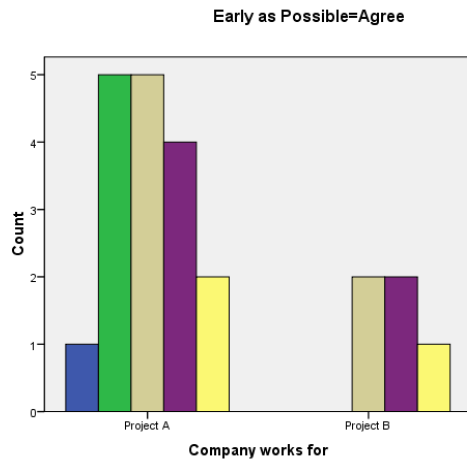
10. Yes, 90% of me says yes, 10% of me will always say no on the basis that, it is depending on the team. I hate to say it, it is back on the individuals, firms, organisations and the culture. Some people will view an incentive as something they will want to drive and strive for and in that try and beat it but is it for the right reason or the wrong reason really and. They do work providing the target figure is sensible in the first instance, that's the thing. Because if the target figure is too high, well come on its simplistic mind will say you are always going to beat it but you are going to share the costs so should you have had the target. I mean if you are driving the cost down, well if the savings are too much then normally something is wrong I think that at the end of the day most contractors or developers would like a little bit of the share of any profits or savings. Where they have been innovative, creative or what ever they want something but the real pain of the exercise what they don't want to do is go into the pain of it again. They must not have pain. I mean that's there process in reality so if its there or thereabouts round about the target that's fine because the target should have incorporated some of the risks element in any case. There will be another risk pot that is separate.
(Client inconsistency).

Appendix Eight

Cross Tabulation Graphs for Question 3

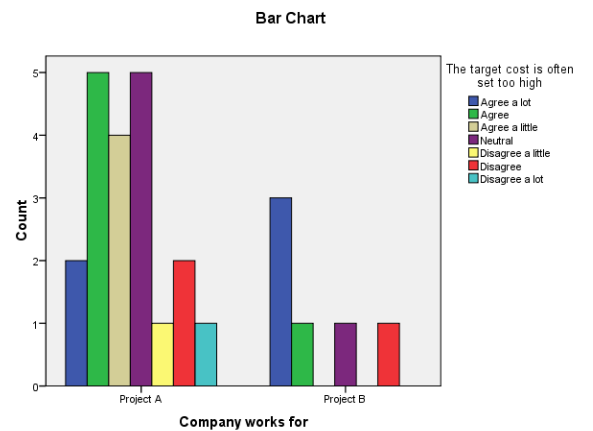
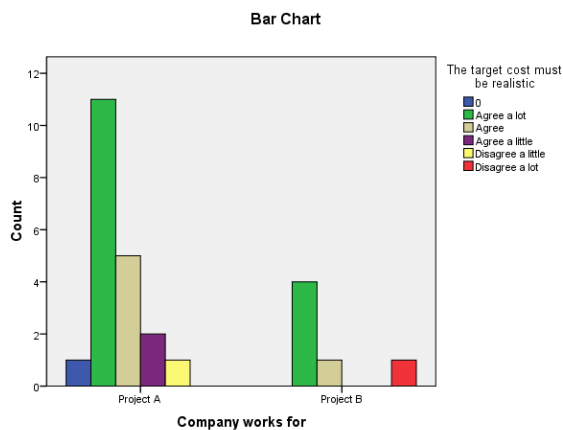
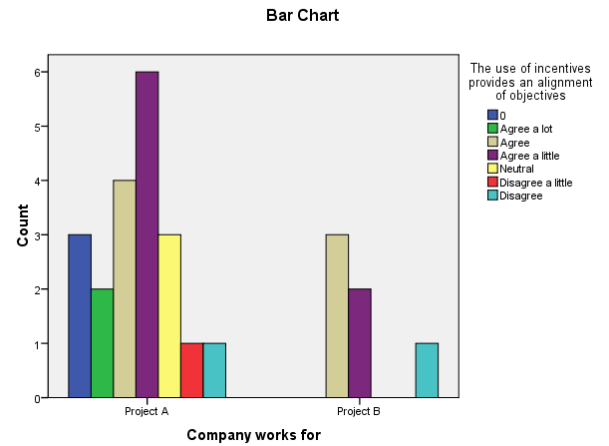
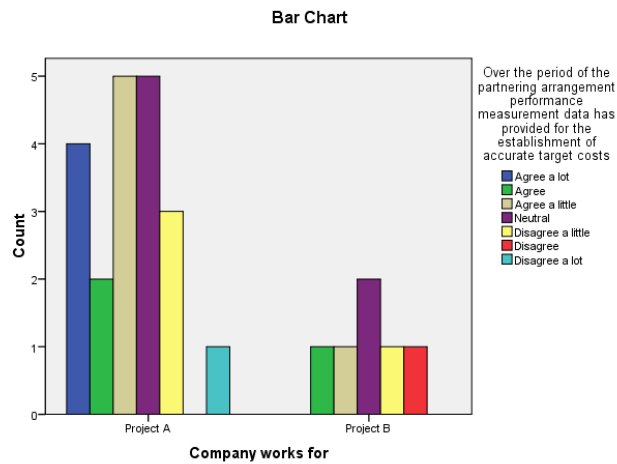
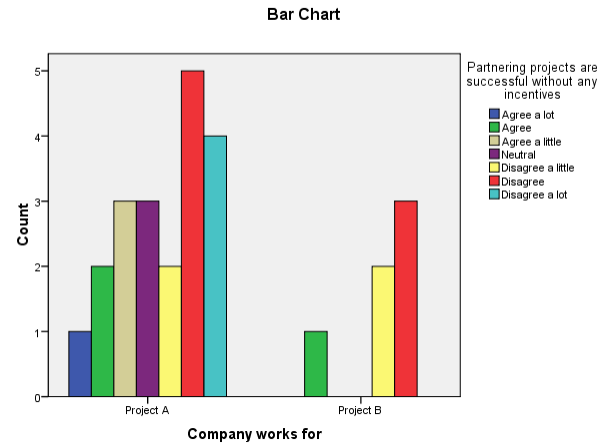
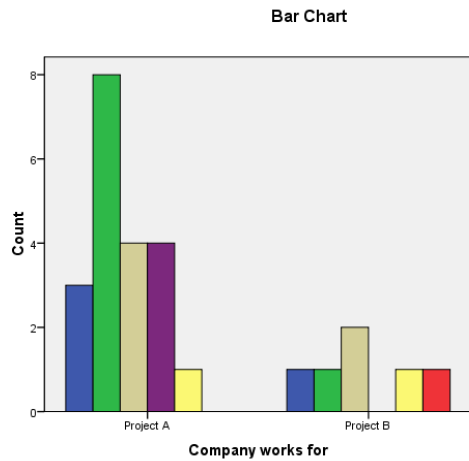


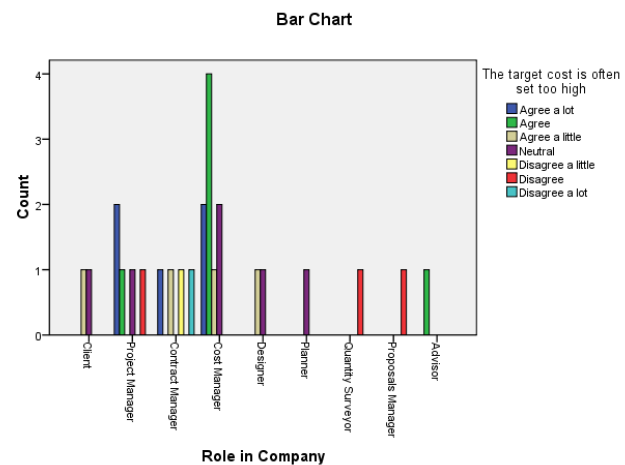
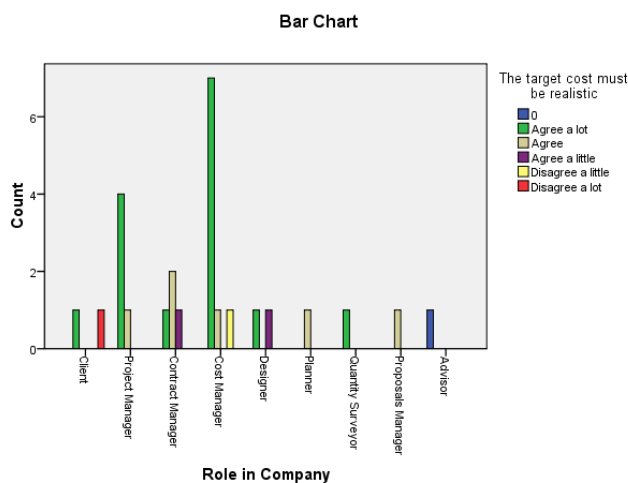
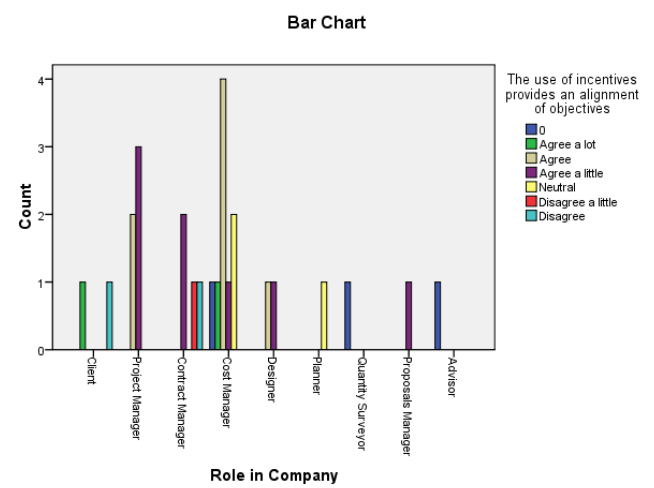
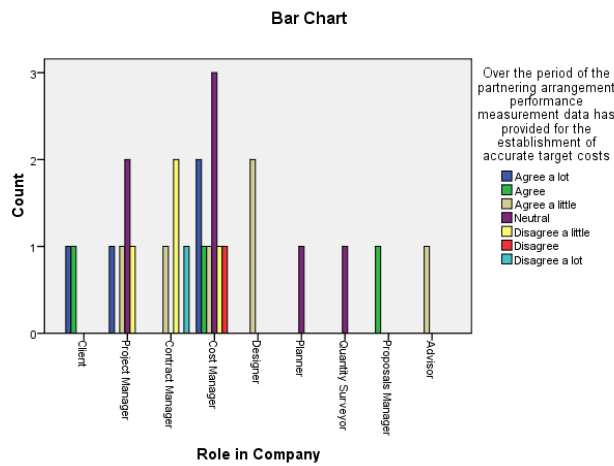
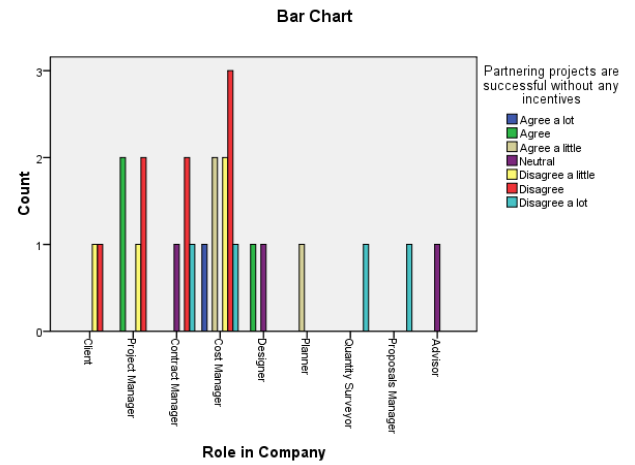
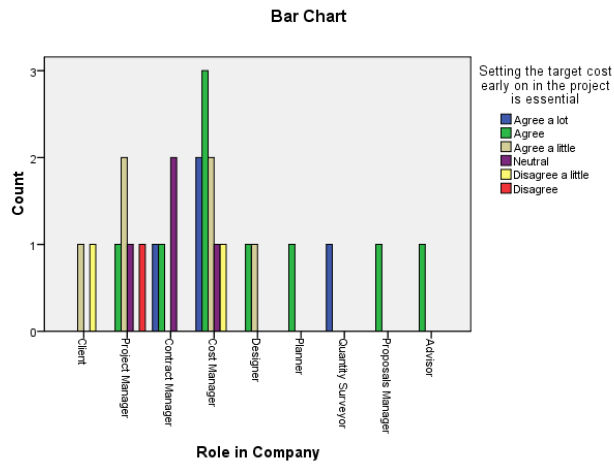


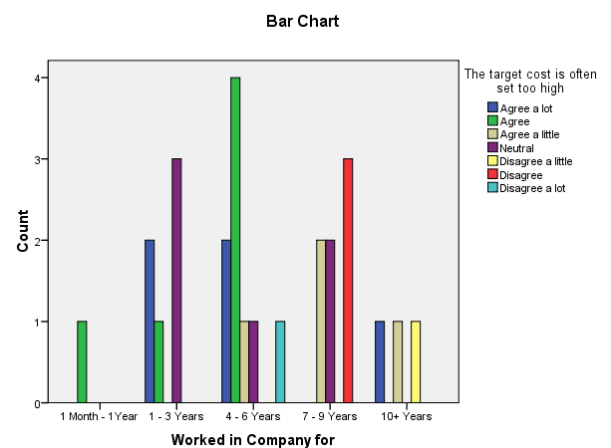
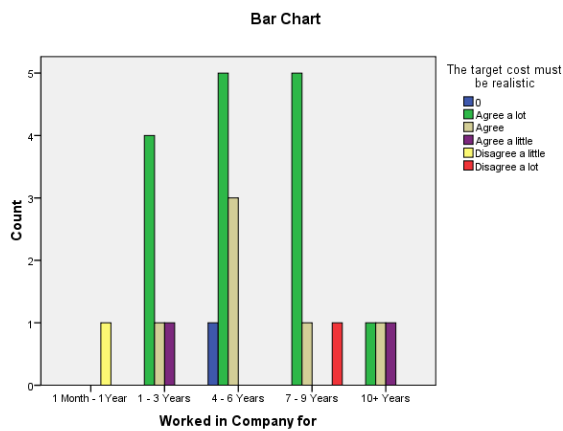
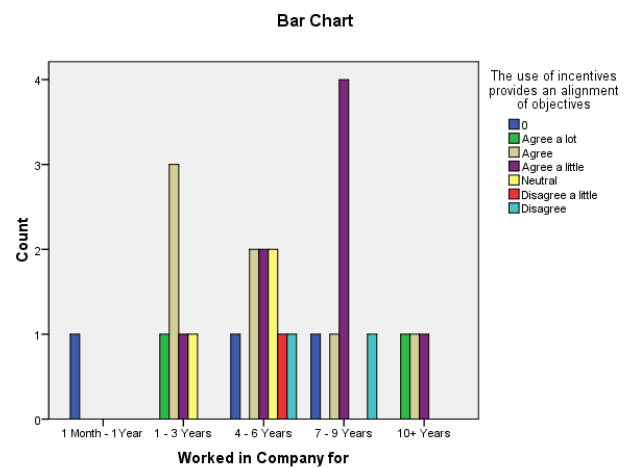
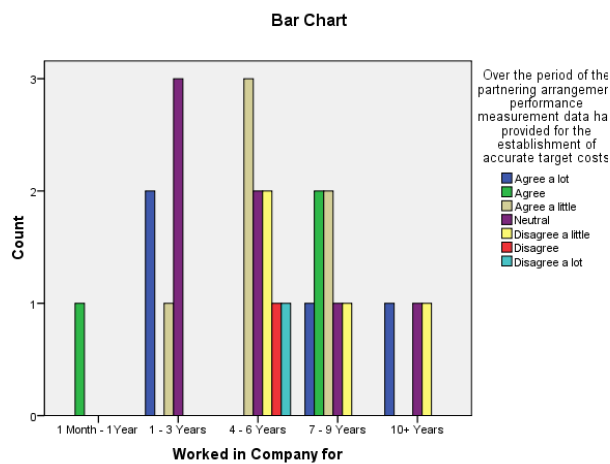
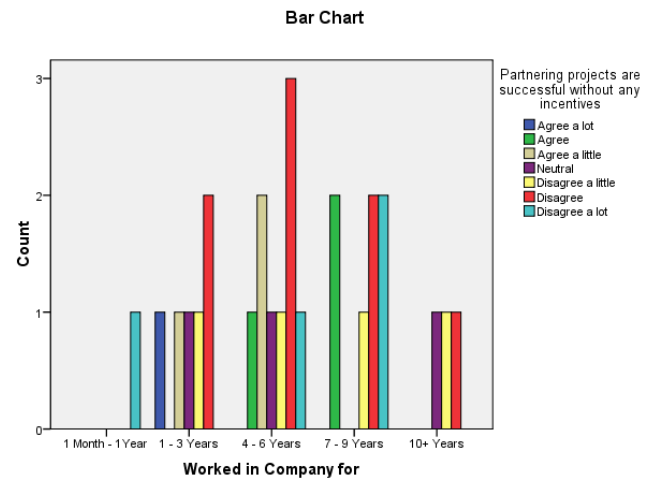
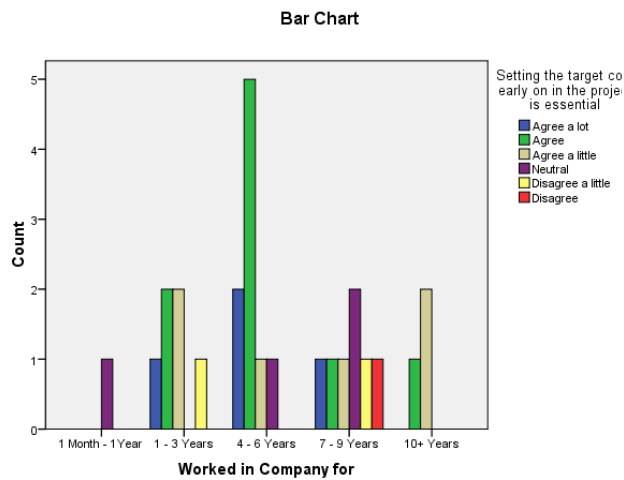


Appendix 4

Cross Tabulation Graphs for Question 5

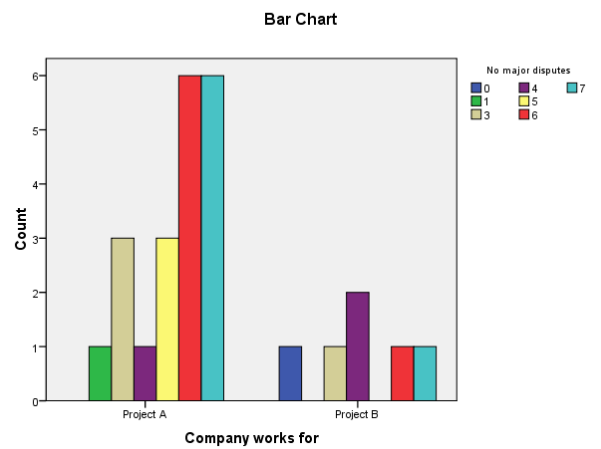
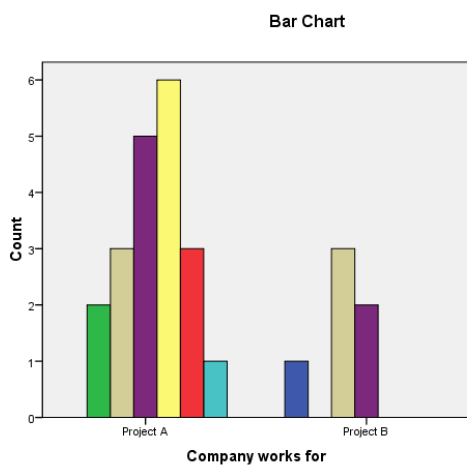
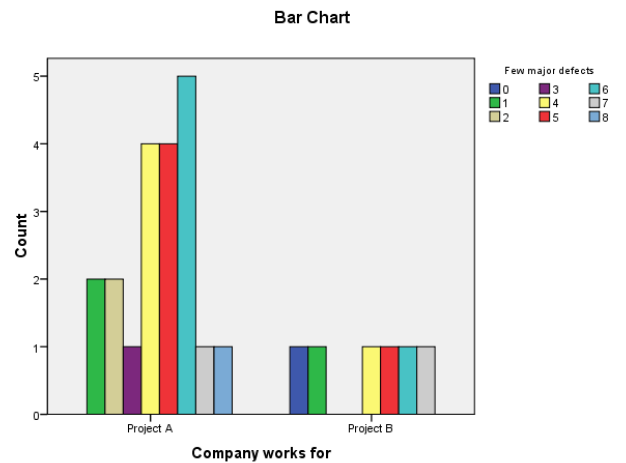
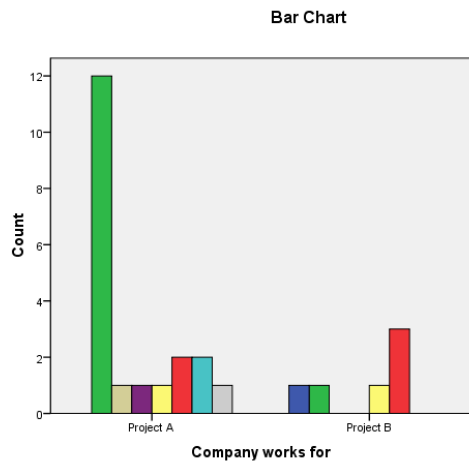
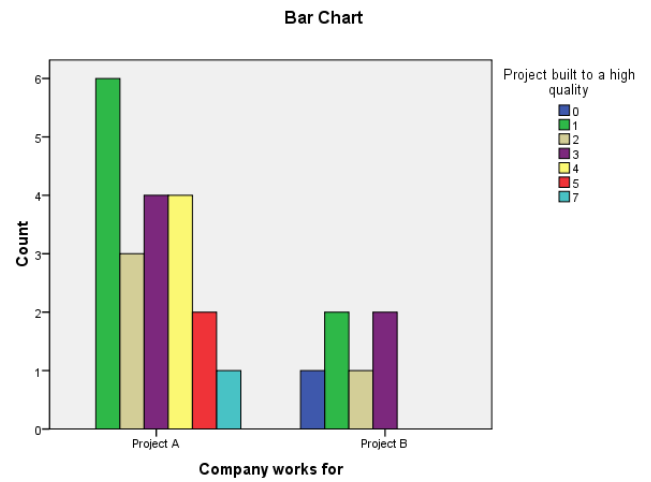
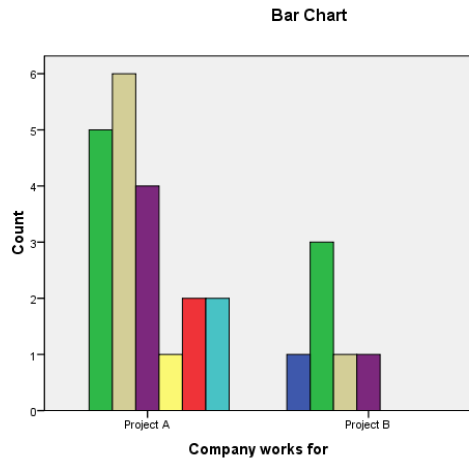


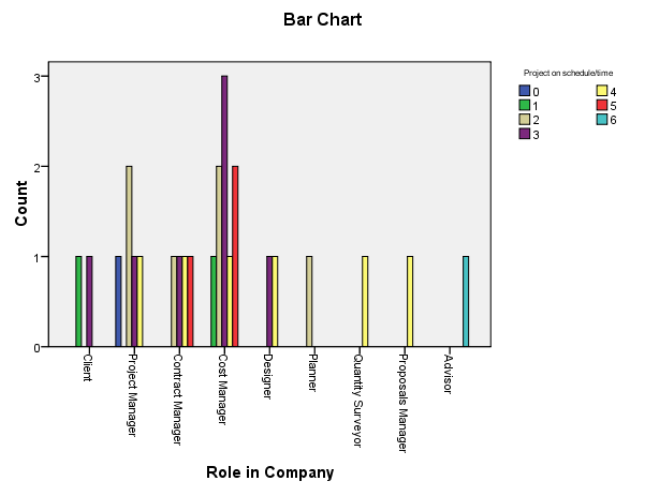
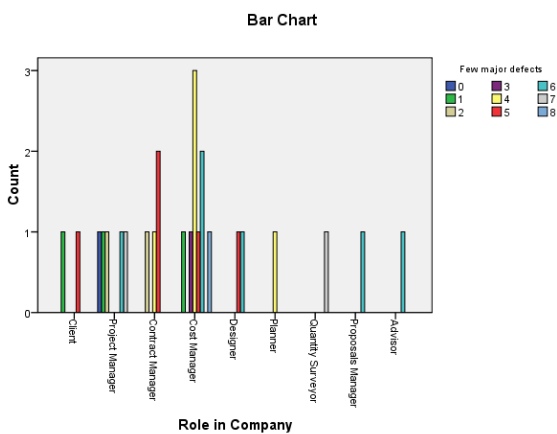
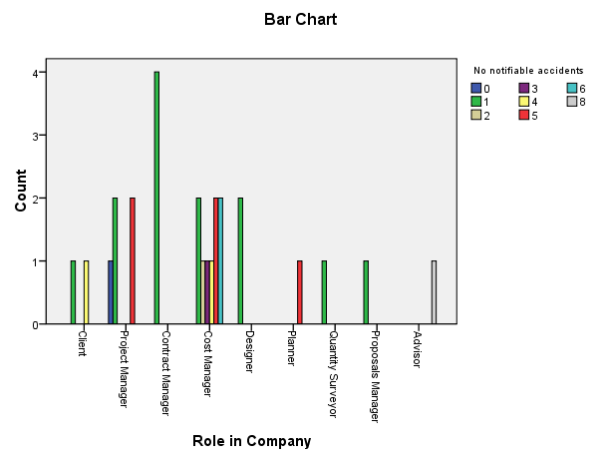
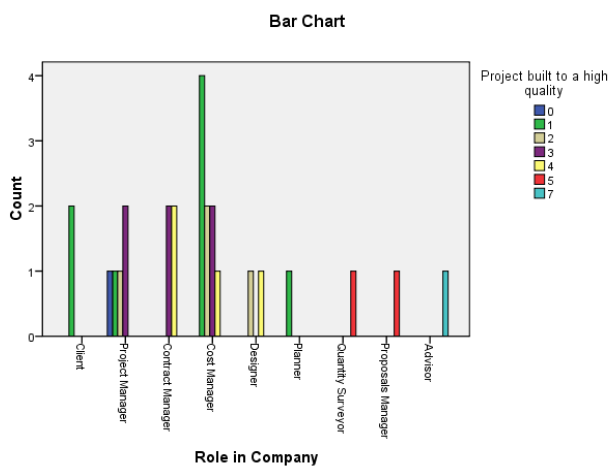
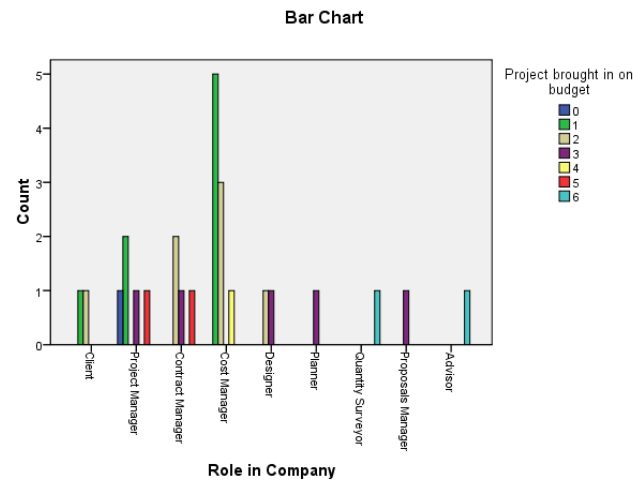
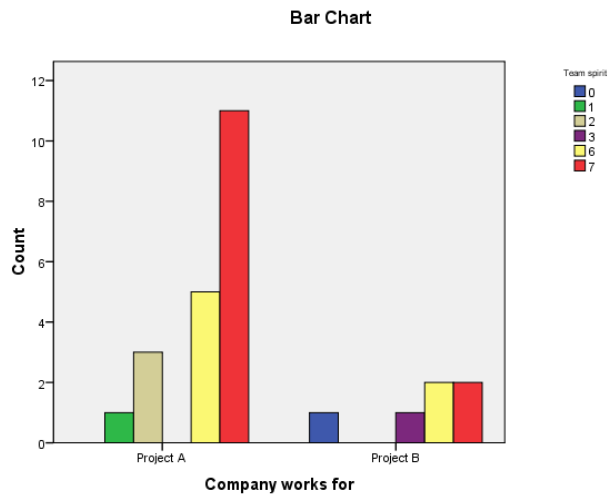


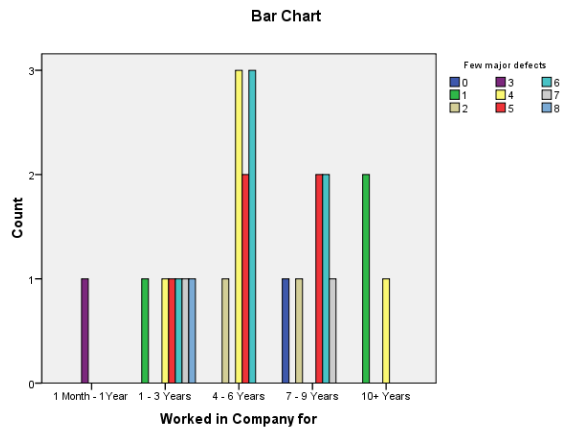
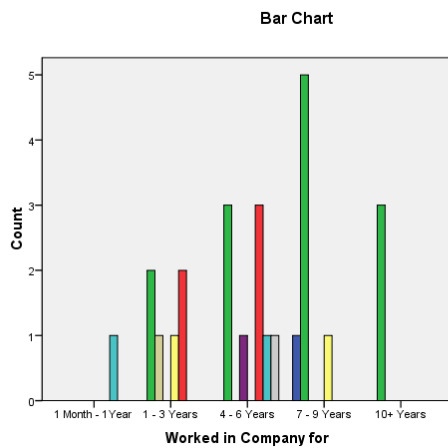
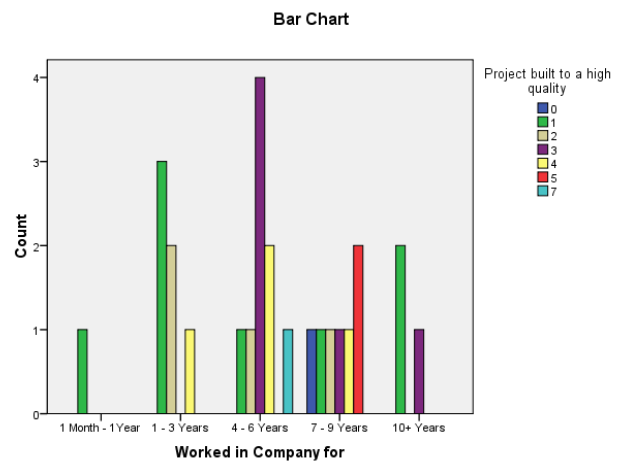
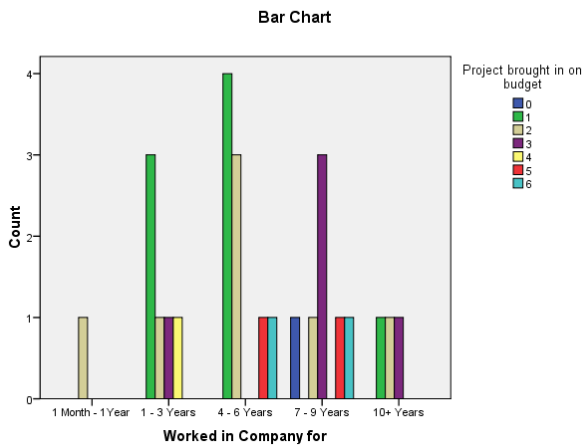
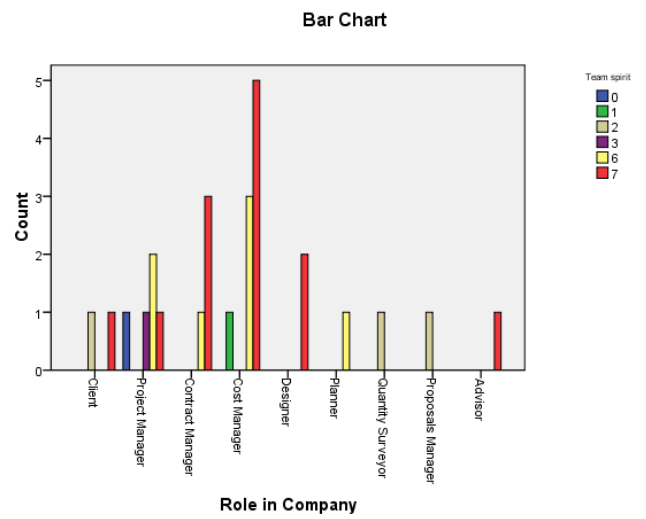
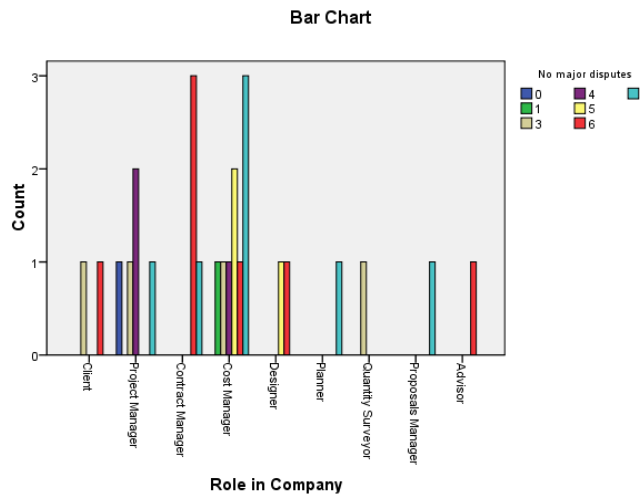


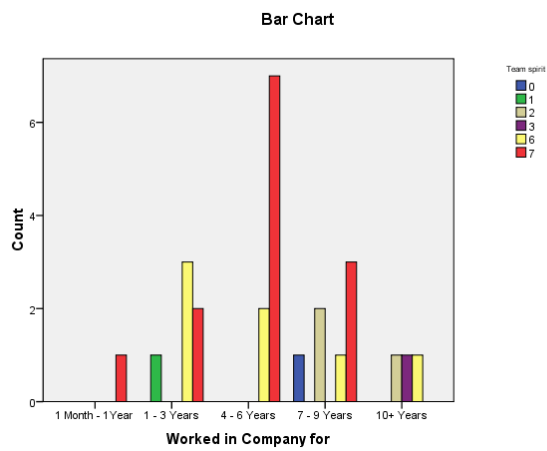
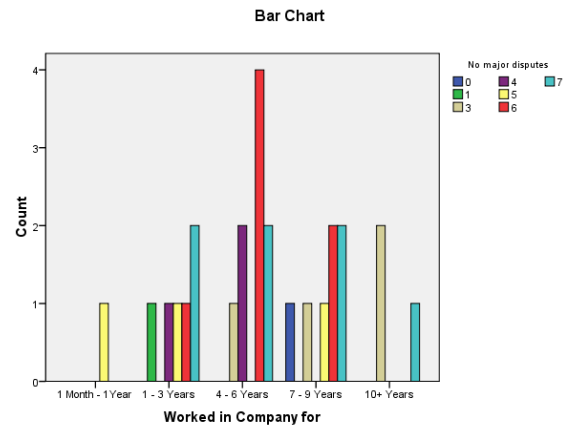
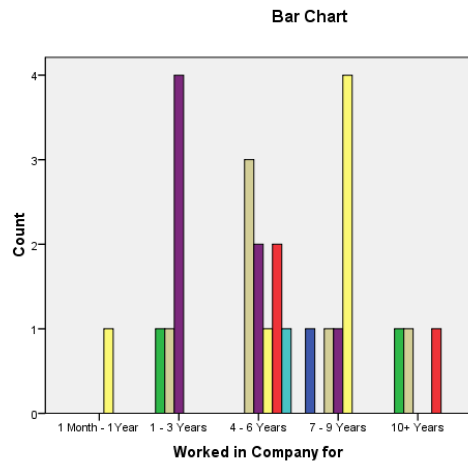
Appendix 5

Cross Tabulation Graphs for Question 6









Graphs for question 5

