THE NAIVETY OF PARTNERING ASSESSMENTS

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Construction managerial literature often argues that gains are to be made by using partnering in terms of reduced cost, reduced delays and/or increased quality. Voices have been raised to approach partnering in a more critical perspective i.e. to look at both advantages and disadvantages when investigating the concept. This paper is an attempt to go in that direction. In order to assess the effects of partnering in a valid way, the evaluation needs to (i) be based on project facts and not personal perceptions, (ii) make a comparative analysis including both partnering and non-partnering projects and (iii) control for other variables that affect cost and quality in order to extract the unique effect of partnering. The existing partnering evaluations, divided into surveys, case studies and comparative studies with many observations, does not fulfil all three conditions. Instead partnering should be evaluated by a quasi-experiment or with a regression analysis and focus on quality and cost, the variables that creates value.

Keywords: evaluation, partnering, project success, quasi-experimental methods, regression analysis.

INTRODUCTION

The overwhelming part of the partnering literature is of optimistic nature. This can to a large extent be explained by the extensive amount of consultant literature with the purpose of selling the concept. More scientific work has also provided theoretical arguments in favour of partnering accompanied by empirical papers most often showing positive results. Voices have been raised to approach partnering in a more critical perspective (Green, 1999; Bresnen and Marshall, 2000) i.e. to look at both advantages and disadvantages. This paper builds on that notion and sets out to improve partnering evaluations. The contribution is to expose weaknesses in current partnering evaluations and provide suggestions on how the evaluation problems can be handled in order to evaluate partnering in a well-founded way.

Three conditions for good evaluations are stated in the following section. Section 3 proceeds to review the current bulk of partnering evaluations based on these conditions. The review concludes that the evaluations of partnering can be improved and the rest of the paper focuses on how the improvement can be done. Section 4 describes two approaches that fulfil the conditions for good evaluations, the quasi-experimental and the regression analysis. Section 5 argues that cost and quality are the important variables to measure when evaluating partnering. Section 6 concludes.

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HOW SHOULD PARTNERING BE ASSESSED

In order to say something well founded about the effects of partnering in a construction project, three conditions needs to be satisfied. First, the evaluation should be based on project facts. These are controlled data, which are as objective as possible. Subjective declaration, i.e. uncontrolled and not explicitly described data, of the effects of partnering cannot be considered project facts and cannot provide the basis for a partnering assessment. Second, the evaluation must include a comparative analysis. To draw conclusions about the effects of partnering, these effects have to be compared to non-partnering projects in order to analyse if partnering has improved the outcome. It could be argued that at least implicitly such an analysis is always done. To provide a reference case for the reader, an explicit description of traditional projects is required. Third, other affecting variables must be controlled for. Since construction is a complex area with many variables affecting the outcome of a project, it is hard to extract the unique effect of partnering. In order to do so, other variables have to be controlled for, i.e. ceteris paribus analysis. This can be done in different ways e.g. by statistical methods or by pair analysis.

WHAT HAS BEEN SAID AND DONE

Chan *et al*. (2003) set out to review the benefits of partnering in general and did so by providing a summary of 29 partnering papers. The paper presents a good overview of what is usually said about the benefits of partnering, with a closer relationship being the prominent advantage. However a large part of the reviewed papers are theoretical implications with no empirical support. In contrast to Chan *et al*. (2003) this paper only reviews empirical papers. The following three types of studies can be distinguished from literature.

Surveys
Surveys are convenient when wanting to gather information about people's opinions concerning a specific issue (Balnaves and Caputi, 2001). These types of studies are often conducted with questionnaires. Many of the partnering assessments are done in this manner. Black *et al*. (2000), Haksever *et al*. (2001), Chan *et al*. (2003), Beach *et al*. (2005) and Fortune and Setiawan (2005) are based on questionnaires to project managers or persons in equivalent positions. The questions are formulated in a way that the respondent's answers reflect what they felt were the benefits of partnering or what they thought were the benefits of partnering. Because of actual involvement there is a risk of the respondent being more positive to partnering, which might entail incentives to signal better results then actually achieved. With the answers being based on personal perception there is considerable danger of interpreting these results. The answers received cannot be considered project facts. Concerning the comparative analysis the questionnaires can be designed in a comparative manner, letting the respondent indicate the effects of partnering in comparison to non-partnering projects. Even if this is the case it is still hard for respondent to recap old projects and give objective answers. In the same way it is hard to extract the unique effect of partnering, despite being the person with most knowledge about the project (often the project manager). Hence, none of the three conditions above are fulfilled and partnering cannot be assessed from these studies.

None of the survey papers explicitly set out to make general claims about the effects of partnering. However, these are often referred to by consultant reports and in the

general debate when presenting the positive effects of partnering, so a clarification is justified.

Case studies

Case studies are recommended when wanting to gather in-depth knowledge about a specific case. The purpose of case studies is not to draw general empirical conclusions (Yin, 2003). Different benefits of partnering has been pointed out with case study methods, see Ellison and Miller (1995), Barlow *et al.* (1997), Bresnen and Marshall, (2000), Vassie and Fuller (2003), Bayliss *et al.* (2004), Chan *et al.* (2005) and Emsley (2005). All these studies are combinations of interviews and questionnaires. This approach to evaluate partnering fulfils the first and the third condition far better than the surveys. The researcher enhances his understanding of the project by, in combination with questionnaires, including interviews and observations. This strengthens the quality of the data. The condition to control for other affecting variables is still hard to fulfil but might be facilitated with an experienced interviewer being able to objectively remind the respondent about other affecting variables. Most of these studies (except Bresnen and Marshall, 2000; Vassie and Fuller, 2003) do not make any comparative analysis of non-partnering projects and fail to satisfy condition two. Criticism has been raised concerning only positive outcomes of partnering being reported and that there is a lack of objectivity in some of the case studies (Green, 1999; Bresnen and Marshall, 2000).

Comparative studies with many observations

There are a few studies on partnering effects with a large number of observations in the scientific literature (Larson, 1995; Ruff *et al.*, 1996; Gransberg *et al.*, 1999). These three studies are to a large extent based on questionnaires with 280, 60 and 400 observations, respectively. Despite the large number of observations, the studies suffer from the same problems as the surveys, with being based on respondents' perceptions of the effects, which cannot be considered projects facts. The studies make a distinction between partnering and non-partnering projects, which satisfies condition two for a comparative analysis. However, none of the studies control for other affecting variables. For example, these studies can only say that the projects that included partnering cut cost improvement by 5 %, in relation to budget, but cannot say that partnering cut cost by 5 % because there could have been other variables that caused this positive effect. Hence, the more quantitative papers do not satisfy condition one and three.

Summary

None of the above studies have fulfilled all three conditions in a satisfying way and cannot be considered good evaluations according to the conditions above. Even though most of them point in the direction of partnering showing most potential in improving communication and the relationship between parties, it cannot be settled that these are the benefits of partnering, as there are shortcomings in the evaluations.

AN IMPROVED ASSESSMENT METHOD

This section will present two approaches that potentially fulfil the stated conditions for good evaluations.

The quasi-experiment

The classical experiment takes a random sample of people/objects and then randomly divides them into two groups. One group get some sort of treatment (treatment group) but the other does not (control group) and conclusions can be drawn whether the treatment caused an effect. This is according to Rossi (1989) the most prominent way of doing evaluation. Often when wanting to evaluate some social programme or policy the evaluator does not have the privilege of getting to draw randomized samples to compare. Instead the treatment group is given, as it appears "naturally" in society. Under such circumstances Rossi (1989) suggests that the quasi-experiment is suitable. The problem is then to find the best possible match to the predetermined treatment group concerning all relevant independent variables except the one to study. If matching is done in a satisfactory way the study fulfils the condition of controlling for other affecting variables. Given that the study is based on reliable data, i.e. proper projects facts, this study would also satisfy the first condition and obviously the condition for a comparative analysis.

Regression analysis

Another way of satisfying the above conditions when studying the effects of partnering is to apply a more statistical approach. Instead of finding a "completely" matching control group, differences are accepted and the strategy is to control for the effects of other factors by using statistical techniques. In its simplest form, a linear regression model that fulfils the CLM-assumptions (classical linear model) allows frequentist statistical inference to be drawn. In other words, a model can be constructed with variables explaining e.g. cost overruns in construction projects. Including a dummy variable for partnering generates an estimate for the unique effect of partnering on cost, holding all other variables constant. Just as in all empirical analysis, the regression analysis requires good data in order to draw conclusions and since the sample is randomly drawn, the method also satisfies the condition for a comparative study.

Which method to choose

Both methods above satisfy the stated conditions for good evaluations, the next question is which one to choose. An argument used in favour of the quasi-experimental approach is that the regression analysis obtains biased estimators when relevant independent variables are omitted (e.g. Meyer, 1995). This problem is due to data unavailability or because the variable is not considered, but the complication does not disappear by changing method. In order to make a ceteris paribus conclusion with the quasi-experimental approach, the control group has to be chosen based on the same variables as is to be included in the regression model. If not, the effect of partnering could for example be biased in the sense of the control projects effect on cost being negatively influenced by a variable not included in the partnering projects. Hence, the quasi-experiment face the same problem, the researcher needs to know the relevant variables and have data on them in order to make a good match. A valid argument in favour of the quasi-experiment is that the problem of defining the functional form of the regression model disappears, whereas the regression analysis is a better way of handling large amounts of statistics. In reality none of the methods are perfect, which justifies their combined existence. Both approaches are needed in order to form a rational belief about the effects of partnering. Using a Bayesian terminology, one should use all the available data and methods in order to update the prior.

Triangulation (Denzin, 1970) and mixed methods (Creswell, 2003) have come up as a ways to combine different approaches and data.

WHAT SHOULD BE MEASURED – A REVISION OF PROJECT SUCCESS

Two methods that improve partnering evaluations have been presented but the question remains on what should be measured. This is usually answered by the definition of project success, which in most cases includes time, cost and quality (e.g. Gaddis, 1959). The following section opposes this view and aims at showing that cost and quality are more important than time. Basic economic theory describes value as, V=B-C, where V is value, B is benefits and C is costs. This is further developed into the utility maximization problem for the consumer and the profit maximization problem for the firm. Hence, increasing benefits or decreasing cost creates value in e.g. a construction project. The interpretation of cost decreasing is straightforward but what constitutes an increase in benefits is not that obvious. Standard economics capture this by utility functions, which represent ordinal preferences over bundles of goods. Lancaster (1966) concretized the bundle of goods by expressing them in characteristics. He assumes that consumers have preferences over characteristics in order to create well-behaved, concave utility functions. Characteristic of goods consist of everything that influence the customers benefit. In a housing project, this could be the visual experience of the kitchen, how soundproof the walls are, the surrounding area, the public transport etc. Adopting Lancaster's view enables benefit to be express in quality features. A better kitchen, a more soundproof wall, a better surrounding area, better connection to public transport would then be directly connected to a higher benefit. This paper assumes that quality consist of everything influencing the customers utility i.e. benefit. So lowering cost or increasing some characteristic of quality creates value. But there is also a preference over time, which can be handled with a discount factor. In a similar fashion to Gardiner and Stewart (2000) an e.g. road-building project can be described as an investment in a cash-flow model, see figure 1.

Project finished

Time
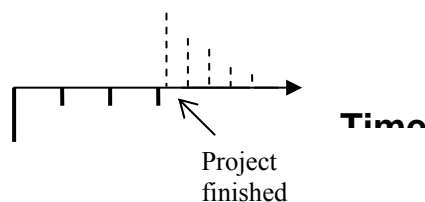
Figure 1:. Cash-flow model of a road-building project

A road-building project consists of cost (bold in figure 1) and net benefit (dotted in figure 1), which need to be discounted in order to get a net present value. Again, to increase the net present value, cost can be decreased or quality characteristics of the road can be increased i.e. a more even road surface, better safety, better restaurant etc. By making the road available for traffic earlier, time can have an effect the net present value. However, time is not interesting in itself, because it does not create any value. If for example one sub-contractor is five weeks ahead of schedule but his colleague, working on an independent assignment, is three weeks late the first contractors good work is uninteresting. Evaluating partnering in this perspective, basically asks the

question whether partnering entails a higher net present value than non-partnering projects. This can be done by, lower costs, higher quality, making the cost come later or benefits sooner. Time cannot be assigned the same importance as cost or quality, since it is only interesting if it affects any of these. Project success should be defined by cost and quality, with time as a dimension of these two. Instead of subtracting time from project success, voices have been raised that the three measurements are not enough and that KPIs (Key Performance Indicators) schemes should be extended (e.g. Crane *et al.*, 1999; Dainty, 2003). There is some truth to that statement and also that time is important but not in the way that is usually put forward. The extended schemes include KPIs like end-user satisfaction, participation satisfaction, personal development, information quality etc as important things to measure in order to determine project success. It can be questioned whether a project is successful if cost and quality are deficient but participation satisfaction, personal development and information quality score high in the participation survey. These sorts of projects are not sustainable in the long run. There is a point in using the extended KPIs as potential indicators of cost and quality. However, just like time, they are not interesting in themselves but might help improve understanding of a project.

Defining cost, quality and time
Construction literature has often used a cost growth measurement, where they look at percentage change of actual cost in respect to the original cost or contract amount/price. This measurement is very much dependent on the initial price, which causes a problem. It would be wrong to assume, especially with few observations that the market is efficient and the contracted price always reflects the "real" cost. For example, if a contractor dumps the price in order to win the contract it would be misleading to define project success on the cost growth measurement when a cost overrun still could constitute a low cost. This problem grows with more complex projects where cost is harder to estimate. Hence, the efficient level (i.e. the "real" cost) of the initial price is vital to the cost growth measurement. There are however ways to handle this problem. Further investigation surrounding the procurement method and the amount of competition on the market is one way of making sure that cost growth measurement gives a good indication of the project's economic outcome. Another way is to compare project with similar projects over time in order to conclude if the procured price is reasonable.

Defining quality is hard since the concept is highly subjective. What one person perceives as high quality might not be concurred by the next person. This is the fundamental problem of defining quality. A potential solution is to agree on a level of quality. This is often done in the contracting documents, where the client and the contractor agree on what is to be delivered. Quality can then be defined as the level of fulfilling the specifications. This definition is often used in the construction industry and is commonly known as conformance to requirements (e.g. Crosby, 1979). The conformance definition solves the *ex ante* problem of different conceptions of quality between the client and contractor but might entail a problem concerning *ex post* measurement of quality. Parties can differ in their interpretation whether a certain aspect of the contract is fulfilled or not. Critics might say that the subjectivity problem, mentioned in the beginning of this section, has been transferred from an *ex ante* problem to an *ex post* problem. A possible solution to the *ex post* problem is to write more complete i.e. extensive contracts (Lind and Nyström, 2006).

Defining time as meeting schedule entails that a deviation always affects the net present value. This definition requires a control that the schedule is efficient, in the same way as the cost growth measurement.

Measuring cost, quality and time
Direct measurements are based on project data i.e. systematic and formal outcomes of the project. Concerning cost, this is the cost growth measurements with a combined analysis of the procurement situation to see whether the initial cost reflected the "real cost". The intention is to control for an original contract cost that is efficient and not strategically set. If this is fulfilled, then the cost growth measurement is satisfactory. Hence, a formal follow-up concerning the outcome of cost, quality and time in comparison to budget, contracting documents and schedule can be considered direct measurements of a project combined with an analysis of the initial levels. When direct measurements of cost and quality are not available, indicators of these are suggested to be the next best thing. The indicators should be seen as areas to study in order to form an opinion on their effect on cost or quality. It is suggested that contract flexibility, additional work and disputes have an effect on cost and quality.

1. Contract flexibility

Since contracts cannot be complete and construction projects are complex, a realistic assumption is that new information will arise during a project. The new information could then be seen as endogenous, e.g. better solutions not thought of ex ante, or as exogenous, new circumstances that give rise to pareto-sanctioned renegotiations. In both types of new information a flexible relationship between client and contractor is likely to facilitate finding the most efficient solution concerning both quality and cost (Nyström, 2005). In order to assess the degree of contract flexibility in construction projects e.g. concrete efficiency improvements, the site meetings are suggested to be studied.

2. Additional work

Additional work is often initiated by the contractor because of shortcomings in the contracting documents. These works are unexpected and therefore expensive for the client. A large amount of additional work could also indicate further flaws. In order to get a better understanding of quality and cost, a further analysis of the additional work might be justified.

3. Disputes

It has been said that partnering came up as a way to avoid expensive litigations (Larson, 1995). However, disputes do not have to end up in court and are to some degree present in every construction project (Pinnel, 1999). Studying these could give further information about the climate in the projects e.g. if disputes are handled smoothly or if they hold up the project.

CONCLUSION

This paper has exposed weaknesses in the bulk of current partnering evaluations and provided improved methods. The regression analysis and the quasi-experimental approaches are suggested as well-founded methods to evaluate partnering, as they handle the problems of comparativeness and other affecting variables when measuring the effect on cost and quality. These two measurements are the most important since they create value, while time should be included if it affects the net present value.

Indicators of the measurements are required in order to control for efficiency and since data sometimes are hard to find. This analysis should focus on contract flexibility, additional work and disputes should work.

It should also be acknowledged that partnering in a longer perspective might have some effects besides cost and quality. These effects are intangible and aim at making the industry more attractive and appealing to young people. How to conduct such a study has not been addressed in this paper.

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