“WHAT PLACE FOR APPENDICES IN CASES”

Are cases with more appendices better? Why/Why not?
By Emmy Dannehall

**Purpose:** This article aims to make a contribution to the knowledge of the occurrence of appendices in case studies. The author also aims to get a better understanding about the usage of appendices in cases.

**Design/methodology/approach:** By gathering several cases the author has been able to make an analysis of the occurrence and therefore answered the research question. No new information has been added in this article, the sources are all secondary.

**Findings:** The findings that have been made is that there is not a clear norm to when an author chooses to use an appendix or not it is depending on the author what s/he thinks is of importance for the reader to be able to understand what is in the text. Superfluous information is put in the appendices for the reader to gather more information if wanted.

**Keywords:** Case Studies, literature review, appendices

**Paper type:** Article/Literature review

**Introduction**
An appendix, or if there are several, appendices, hold all information that is not needed to be explained throughout the text but is good to have to validate a conclusion or back up the analysis in a case study. An appendix can be raw data, calculations, graphs, figures and other similar details (Teaching and learning support), (Lowder, Skoet, & Raney, 2016). The usage of an appendix in a case study is not that common, unless the data collection is of great magnitude. It is more common that the data is displayed as figures and tables throughout the text itself and then explained more in the surrounding text (Solberg Søilen & Huber, 20 Svenska Fallstudier för Små och Medelstora Företag, 2006). In this article a wide selection of case studies with and without appendices have been studied to answer the question; are cases better with appendices?

**Method**
The method that the author has used for this article is doing research online to find case studies with and without appendices, and therefore has made it possible to answer the research question whether a case study is or is not better with the appearance of appendices. All sources are secondary and the author have not compromised any of them. The topic of the case studies varies to make sure that there is not a norm for how to make a case study within a specific topic, most of the cases are within the economic discipline. The author has knowingly chosen cases without appendices to be
able to do a comparison of what sort of information that is displayed in tables and figures when there is an appendix versus when there is not an appendix to back up the collected data.

In the text, all cases have been studied from the view if it is better to have the figures and table incorporated in the text or as an appendix and therefore no regard to the subject has been done but only how the author/authors of the cases have chosen to do regarding these criteria.

**Emiprical findings**

In the book *20 Svenska Fallstudier för Små och Stora Företag*, the authors have conducted case studies on small and medium sized business (Solberg Søilen & Huber, 20 Svenska Fallstudier för Små och Medelstora Företag, 2006). In this book the majority of the cases has tables and figures incorporated in the text. One example is the FIRO model that is used (Solberg Søilen & Huber, Mercatus Engineering AB, 2006). This model is there to show the reader how the company, through teambuilding moved from the first stage till the last one and is now a well functioned team of co-workers.

The case study made about the company Berglunds Mekaniska AB has a table incorporated with the text to show the reader a quick view of how the companies’ turnover has been the last few years (Solberg Søilen & Huber, Berglunds Mekaniska AB, 2006).

In the TOMVA case the table shows the reader how the company has grown in both turnover and the number of increasing employees during the last 13 years (Solberg Søilen & Huber, TOMVA AB, 2006).

At Glimåkra Akvamatik AB the company suffered from a demand loss, something that is told in the text and then shown in a table. Later in the text the company hired an engineer to develop a screen wall and the figure in that part of the text shows how tests were made and how the sound travelled with the wall in a set up office. There is also diagrams showing how good the sound absorption really is and at what sound level they are the most efficient (Solberg Søilen & Huber, Glimåkra Akvamatik AB, 2006).

With ADC, everything went on good until the market had been saturated and the company did not get as many orders as before, so the company had to let people go. The table in the text shows the flow of these events (Solberg Søilen & Huber, ADC of Sweden, 2006).

Bräcke Trähuskomponenter AB worked from a model. They took an already existing model and made it their own and with the first figure they showed how the leaders of the company was applying it. This model helped the employees and the leaders to think differently (Solberg Søilen & Huber, Bräcke Trähuskomponenter AB, 2006).

In the case about Fotfavoriten the table clarifies what was already explained in the text. When Eva Wörman was working alone there were limitations to the turnover, but when she started to hire more specialists the turnover increased (Solberg Søilen & Huber, Fotfavoriten, 2006).

The MSG group consists of three companies and the first table shows a quick overview of their three companies and the number of employees together with the turnover. In table 2 it is shown how the numbers of orders has sunk in the Swedish market, in actual numbers, how many of the manufacturers were Swedish and the decreasing percentage of tools
manufactured in Sweden (Solberg Søilen & Huber, MSG (Mould Supply Group), 2006).

In the case study with Rönngårds Åkeri AB the picture shows how the new hand computer for the drivers looks like so the reader get a clear picture of what the company had in mind while explaining the product in the text (Solberg Søilen & Huber, Rönngårds Åkeri AB, 2006).

The Waltergruppens Skolor AB are using a high performance model in their organization and the model is shown as a figure and then explained more thoroughly how the organization is using it in the text (Solberg Søilen & Huber, Waltergruppens skolor AB, 2006).

Unident AB is using a Balanced Score model (BSC-model) in their company. This model is quite complicated and is explained thoroughly in the text with a definition, a list of the most central parts within the system and then shown in a model that shows the interaction of the perspectives. The upcoming table then shows how the company has performed since they started to use this BSC-system and is not explained that much in the text (Solberg Søilen & Huber, Unident AB, 2006).

The final case from the book 20 svenska fallstudier för små och medelstora företag, is about the company MSA Sordin. Throughout the text, it is read that the company has expanded very much and almost every 3rd year they have doubled their turnover. This is shown in the table together with how many staff members they have every measuring year (Solberg Søilen & Huber, MSA Sordin, 2006).

C.A Smith has used appendices in his case study about designing control systems. In appendix A, he is using models to show the reader how he has designed the control systems, and what they are supposed to be used for together with a list of the problems the system is going to control (Smith, 2002).

The Waitakere City Council has been working on becoming an Eco-City, and in one of their case studies that shows how they work to reach this goal. The second study shows the process of “Developing Community Outcomes in Waitakere”. This model shows how the council will integrate the non-eco cities with the eco city, and how it will contribute to an understanding between the two communities (Waitakere City Council, 2008).

In their article about farms and the agricultural land, Lowder, S.K., Skoet, J., and Raney, T. has collected data about farms from all over the world to develop the agricultural lands together with issues and policy decisions. In their text the authors show all the previous literature in this subject together with its findings in the first table. The next table is about the farmland in Guatemala and the percentage of the farmland distribution. Later in the article there is a figure of how the share of all the farms divided by country group. The data collected for this is available in the appendix. The appendix holds all information needed. Table 1 in the appendix displays the number of the agricultural holdings, sorted county wise. Table 3 and 4 displays if the numbers of farms in the geographical areas has increased or decreased and the top five countries and geographical regions with the best agricultural holdings. Figure 2 shows in a diagram what the tables have listed. Figure 4 displays the share of the farms worldwide by the size of the farm land. The data for this diagram is collected from table 3 in the appendix. There the countries have been listed together with how many farms they have
in each size (Lowder, Skoet, & Raney, 2016)

In his case Berggren, N., is using both tables and appendices. His appendices are used to explain what the different variables means and the regression of them for the equations that are in the text (Appendix B). Appendix A holds the different components for the economic freedom. The tables displayed in the text are very like each other, they show the regression of the different variables depending on what Berggren wanted to demonstrate (Berggren, 1999).

When conducting their case study for the Stockholm Transport Bradley, M., & Daly, A did interviews with over 300 people to get the data they needed. In their tables the authors display the outcome of their experiments and complement with an appendix that shows the factors that was measured during the experiments and observations (Bradley & Daly, 1994).

Yadav, V. and Goyal, P. has performed case studies about five different rural innovations from India. In their first table in the text they have a short summary with e.g. all the innovations and what the area of usage is together with information about the creator and the price for the sold innovation. Figure 1 is showing a summary of the results from the research questions that were in the text above the figure (Yadav & Goyal, 2015).

In their case study Granderson, J., Piett, M.A. and Ghatikar, G. have investigated about energy information systems (EIS) and the use of them in commercial enterprises and at university campuses. In the first figure, the picture gives the reader an understanding for how the system works. This is not written in the text. In table 1 the authors display an oversight of the enterprises and universities that are participating in the study. The text explains what is in the table more detailed. In the text about the different organizations there are tables and figures, most of them very like one another, for instance most the cases has a table of the metrics, benchmarks and data sources. The figures all show a problem the organization had and by analysing it with the EIS how the issues got solved. The last table in the text is a summary if the problems and how they got solved based on the energy information. All this explained more thoroughly in the text (Granderson, Piette, & Ghatikar, 2011).

In the study about a combination of social and natural science Evely, A. C., Fazey, I. R. A., Pinard, M., & Lambin, X., presented case studies performed based on different philosophies. In their first table the authors are doing a small comparison between subjectivism and positivism and explain the table in the text. The following tables are both consisting with the different philosophies within these two subjects and have a part of their own in the text where everything is explained more thoroughly (Evely, Fazey, Pinard, & Lambin, 2008).

By using the method of a case survey method, a mix between a survey and a case study Kingsley, G., & Klein, H. K. got useful data during their research on interfirm collaboration (IFC). To measure the IFC five variables were needed, four quantitative and one qualitative. These were displayed in table 1. The variables were also explained further in the text. The next table, table 2, lists how many of the cases that achieved each kind of impact from the variables in table 1. In table 3 the authors have listed different factors and their significance for a business to expand. Table 4 and 5 are connected to each other whereas both lists how to increase the number of members and how to get other kinds of benefits. All
information from these tables are explained in the text together with a motivation from the authors of their thoughts around them. The last two tables are about how to save money and increase projects. Even if the tables list different things, they are unified through the same factors (Kingsley & Klein, 1998).

Students at MIT have the possibility to take part of a program called Terrascope, the program is to help the students to think more in a sustainable way and find solutions for the issues the environment is facing. The table in this study is simple but explained further in the text. The students got to answer questions based on their gained learning during the spring semester and the percentage and mean at a five-point scale are then presented to show how the students have answered (Epstein, Bras, & Bowring, 2009).

Rollins G. M. discussed in his case about a deposit plan for life insurances. The first table shows the reader how the minimum deposit plan work and the fact that it is more expensive if the insurance holder sets up a deposit plan but after time it gets cheaper and after 20 years, compared to purchasing term insurance, it is cheaper to have a deposit plan. In table 2 its compared how a minimum deposit plan looks like at different companies over different amount of time. The comparison is made with and without lapse. In table 3 the same companies with the same variables are listed, but this time with favourable assumptions. In table 4 it is the opposite, it shows the percentages for the least favourable assumptions. In table 5 Rollins has made assumptions on the tax rate and then compared the companies after that variable. Table 6 shows the result when policy loan rates were compared. Table 7 displays a comparison between the minimum deposit plan and the term insurance contract. The appendix of this case displays several formulas and equations that Rollins has used to calculate the comparisons for the different tables and the three companies. Together with some definitions of the formulas the appendix shows the reader how Rollins came to his conclusions (Rollins, 1979).

In the article written by Ewan Sutherland, he studied the use of case studies in telecommunications policy research. When teaching how to analyse policies, the students need to have the right amount of information and then see if the analysis should be positivistic or political. In table 1 the agenda cycle is displayed in how to set an agenda and how to identify, define and prioritize the problems as they occur and hand them over to the government. This table therefore displays the political approach. Table 2 is a list of examples of case studies performed within the policy development area. These two tables are quickly referred to in the text to help the author make his point at that part. Table 3 on the other hand is discussed both in the text and later displayed for the reader. This table lists the criteria that the researcher ought to consider while preparing a case study from with the positivistic approach. Table 4 displays what approaches there is when conducting a case study within a marketing information system. The last two tables, table 5 and table 6, are both listing the occurrence of case studies in different media. Both tables as discussed in the text (Sutherland, 2016).

In his doctor dissertation Dobler, C. conducted a case study on the MENA region. In this dissertation, there are several tables, diagrams and figures, all showing comparison between MENA and advanced economies. The diagrams compares the same economic situation.
between these two economies based on the same variables. The diagrams are then discussed and explained in the text based on what section the diagram is displaying. Most of the tables are about different regression results, and how the data has been calculated are explained in the text. In appendix A, Dobler is showing formulas and equations of the derivation of the equilibrium wage together with where in the text the equation is displayed. The appendix B shortly defines which countries that are in the different groups, both the economical and the geographical groups (Dobler, 2011).

Clark, W., and Holliday, L. conducted a workshop to be able to do their case study. In the workshop report, there is just one figure of a model that displays how a boundary organization is positioned in an end-to-end system. The model is described thoroughly in the text together with the definition of what an end-to-end system is and what the thoughts of the participants in the workshop were about the model. Before the workshop started, the participants got a questionnaire and in appendix A the questions and the answers from each participant have been documented. The questionnaire had different themes that were all discussed later during the workshop. The schedule of the workshops and the questions to discuss within each subject is displayed in appendix B. The speakers within the different themes are also presented here.

In appendix C all of the workshop participants are listed together with their position, department and the organization they are working for. This continues in appendix D where every workshop participant has a short biography to give the reader a presentation of the participants (Clark & Holliday, 2011).

Instead of having figures in their text the authors refers directly to the appendices (National Research Council, 2007). The appendices are all hypothetical case studies on how to solve different issues in Nigeria, that will help the Nigerian society to develop. Appendix A is about what difference it would make if there were an investment to the solar photovoltaics so the population outside of the cities could get electricity. The case shows what this sort of investment would help the society and the people living far from the cities and what is required for this to come true. Appendix B and C are both written in a similar way and discuss what needs to be done for this to become a reality for the Nigerian population, but about other topics instead; Water Purification and Artemisinin-Based Malaria Therapy.

In the introduction of the report Travis A. S. listed a table consisting the four technological stream of change that has happened within the tourism area and what those changes were over time. In figure 1.2 the world population growth is lined up together with the consumption of energy and resources. Figure 1.3 shows the dependency for tourism based on the heritage resources. The tourist system is described in the text together with the authors definition of the system and a figure that better shows the flow of the tourist system. The table in figure 1.5 displays that there are several different types of ‘tourisms’ and the table lists a few of them with what types of travels that particular category of tourists does. Throughout the rest of the text all figures and tables are displaying development opportunities and the most visited areas in that region or country, each chapter holding a different country. The appendix of this book is a list of acknowledgements for all the help the author got while gathering all the information that he needed (Travis, 2011).

To give the reader at better understanding of the performed cases Milner, C. D. and Savage, B. M., displayed several figures
of continuous improvement (CI). Among them are the themes of failure, maturity levels and behaviour patterns, a showing of how the research cycles has been and evolution of CI and its maturity. With the help of CI, the management staff changed their mindset from short-term thinking to a long-term, which made the company profitable again. Figure 6 and 7 shows the timeline of the three phases in the case studies and how the CI timeline was. The phases are described in the text together with the most vital parts of the changed mindset. Here is also a reference to the appendix of these cases. The appendix is a figure that show the score in the different themes of CI during the tree faces of the research period (Milner & Savage, 2016).

While implementing a business system Pala, M., Edum-Fotwe, F., Ruikar, K., Peters, C., & Doughty, N. conducted a case study to see how the implementation worked between the company and ten of its suppliers. In table 1 the authors have listed how many of the orders from the company to the supplier were made electronically. The table also displays the number of orders that was sent before the implementation began. Figure 1 shows how the implementation of the business system looks like and has an explanation in the text that is divided into stages to understand the figure. Figure 2 shows the adoption to the new system and the information that was exchanged between the company and the suppliers. The different coloured boxes are the different type of information that was sent. The figure also displays how the company made sure the supplier got the maximum data accuracy. To make the reader understand the implementation process, the authors made a waterfall model to show the stages involved in the implementation and described each step in the text. Figure 5 show the summary of this project and the duration of the project with each supplier. Figure 6 then continues with showing the average duration in each process stage. While implementing a new business system there are challenges and barriers, these are listed in table 2 and thoroughly described in the text. The appendix gives a more detailed oversight of the implementation of the business system and its stages and its duration time together with how many days it took to develop the system to each supplier (Pala, Edum-Fotwe, Ruikar, & Doughty, 2016).

Analysis
While looking at the cases without appendices the author/authors has collected data that does not need to be read by the reader since that information would not bring any more knowledge about the subject. The cases with appendices use it to educate the reader to understand how the data was collected, in what way or how big the samples were. This kind of information can be considered superfluous since it does not contribute anything to the text directly. By using an appendix, the text get a different kind of flow and not interrupted by bigger tables or equations. If there is a big table in the text it is because it is important to what the authors are writing about in that part of the text, and it gives a completion to what is described in the text. In some cases, the authors do not write that much about what is in the figures and tables and are just quickly referring to it and then the reader must go through the figure by them self. All cases are different and what one author choose to put as an appendix, another choose to have in the text, this shows that the usage of appendices is very individually. But it is also depending on the sample sizes. In the cases by Solberg Søilen and Huber the companies were small and therefore the data was small too, so appendices was not needed since the appendices here would not have.
been used to clarify what the authors meant with a table or figure but just a mere repetition of what has already been written. When the sample gets bigger and the tables get more complicated it can help both author and reader when there is an appendix, since this part of the paper shows a more detailed version of the existing tables and figures that are displayed the text itself e.g. the farm study performed by Lowder, Skoet and Raney.

An appendix does no need to be just tables and equations, but can also be a interview protocol or answers from a questionnaire, where the answers are important for building the text of the case but not that vital so it needs to be cited in the text. If the reader want to take part of what was said exactly during the interview s/he can read the appendix and get the full protocol.

If it is not important to the part of the text the author is writing but it is good for the understanding of the background of the tables and figures an appendix is in order.

Is a case study better with an appendix? This depends on what form of study it is, the sample size and the preference of the author. There is no right or wrong when it comes to the usage of appendices. But the bigger the data is the more occurring is the appendices.

**Conclusion**

It is difficult to say if a case study is better or not with an appendix since authors tend to use them differently. This article has shown that. Since there is no rules of when to use or not to use appendices, only what they can contain, it is therefore up to the author to choose if the data should be incorporated in the text or set in the back as an appendix. The only conclusion that can be made is that when a sample gets bigger, the author tends to have appendices of the biggest data collection and then show a summary of it in the text, either as a table, figure or as a paragraph.

**Future Studies**

For future studies, it can be studied at what point the authors chose to go from not using appendices and when they start using it. It can be studied if it is because of the sample size or the collected data. One point of view can also be if it is depending on the subject the author is writing about. The student can choose from the references used in this article or find others from the Internet. Since this article is based on cases in the discipline of economics the future studies can examine other disciplines as well e.g. medicine or what the student finds interesting.

**References**


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