Benefits and constraints of qualitative and quantitative research methods in economics and management science

It is often not an easy task, especially for budding researchers, to choose the optimal research method – or combinations of methods – to successfully handle a research problem. By “optimal method” I mean such an approach which will allow to answer all research questions pertinent to the research problem in a reliable and viable manner and - at the same time - keep the use of resources (i.e. time effort and money) which will be spent to complete the empirical inquiry to minimum. This issue is especially important for PhD students, who are most often supposed to conduct their research project single-handily. In the paper I will try to present benefits and limitations of qualitative and quantitative research approaches, having especially in mind the situation of doctoral candidates. For this reason, as well as because of the limited volume of the article, I will pay particular attention to the quantitative and qualitative techniques which are most often used in preparation of PhD theses in economics and management sciences, which are survey and multiple case study.

Research paradigms in social science

Quite often scholars choose research method based more on their own preference rather than other factors like research problem characteristics and inquiry environment. Personal preference may be a result of acquired skills, which make certain research techniques easier and quicker to perform, but it may also be affected by philosophical inclinations of the researcher or his environment (notably PhD supervisor). Firstly I will touch on philosophical perspectives on research process and how they affect selection of research method.

When making decisions about research approach it is important to know what kind of philosophical perspectives are typically attached to specific research methodologies and techniques. These assumptions are often referred to as **scientific or research paradigms**, which are defined as very general conceptions of nature of scientific endeavor with which a given enquiry is undertaken¹, representing coherent sets of beliefs about the reality

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(ontological aspect) and the process of acquiring knowledge (epistemological aspect). Probably the most important issues which differ research paradigms are:

1) Whether reality and – by consequence – truth are subjective or objective?
2) What is the dominant way of theory building (induction or deduction)?

These relatively simple criteria allow to distinguish in social sciences a positivist paradigm – which is equivalent to paradigm of natural sciences like physics or biology - and a group of non-positivist research philosophies including constructivism, grounded theory, realism and others. This wide selection of non-positivist paradigms is known by the general label of phenomenological paradigm, as – despite all differences - they share a significant number of common characteristics. The positivist researcher conducting their studies will be striving to discover some kind of objective truth and will tend to use deductive strategy in theory building. In contrast, non-positivist scholars will be convinced of subjective and multiple nature of reality, in which there are as many truths as there are studied persons. Thus, the researcher “needs to report these realities, rely on voices and interpretations of informants through extensive quotes, present themes that reflect words used by informants, and advance evidence of different perspectives on each theme.” Such a view, also calls for the informants being studied in-depth and up-close, which makes it more natural to rely on qualitative and not quantitative methods in gathering and analyzing empirical data. A comparison of the most important characteristics of both paradigms is presented in the table below:

Table 1: Key features of the positivist and phenomenological paradigms in social sciences

<table>
<thead>
<tr>
<th></th>
<th>Positivist paradigm</th>
<th>Phenomenological paradigm</th>
</tr>
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<tbody>
<tr>
<td>Basic beliefs</td>
<td>The world is external and objective</td>
<td>The world is socially constructed and subjective</td>
</tr>
<tr>
<td></td>
<td>Observer is independent</td>
<td>Observer is part of what is observed</td>
</tr>
<tr>
<td></td>
<td>Science is value-free</td>
<td>Science is driven by human interests</td>
</tr>
<tr>
<td>Researcher should</td>
<td>Focus on facts</td>
<td>Focus on meanings</td>
</tr>
<tr>
<td></td>
<td>Look for causality and fundamental laws</td>
<td>Try to understand what is happening</td>
</tr>
<tr>
<td></td>
<td>Reduce phenomena to simplest</td>
<td>Look at the totality of each</td>
</tr>
</tbody>
</table>

2 For more extended definition of research paradigm see Creswell J.: Qualitative Inquiry and Research Design; Choosing Among Five Traditions, SAGE Publications, Inc., Thousand Oaks, California, USA, 1998, p. 74
<table>
<thead>
<tr>
<th>Preferred methods</th>
<th>Operationalising concepts so that they can be measured</th>
<th>Using multiple methods to establish different views of phenomena</th>
</tr>
</thead>
<tbody>
<tr>
<td>include</td>
<td>Taking large samples</td>
<td>Small samples investigated in-depth or over time</td>
</tr>
</tbody>
</table>


As a comment to the table, I must point out, in line with what may be found in the work by Lisa Given⁴, that this table as well as similar ones found in other publications may imply a certain rigidity in the idea of paradigm. It may seem that acceptance of one paradigm requires adoption of all its features. But for instance in case of positivism “it is clear from its history that there is no such rigid structure, that it is possible to be a positivist without being a realist and without believing in correspondence, dualism, or certainty.”⁵ It is then possible and acceptable in justified situation to “borrow” elements distinctive for other paradigms, like for example using induction in otherwise positivist research design.

It is quite usual in academia to identify quantitative methods with positivist approach and – on the other hand – quantitative ones with non-positivist philosophy. It is however, as if to assume that the use of specific research tools – which are qualitative and quantitative techniques – should presuppose some philosophical views of the researcher. I believe that, it is probably more correct to think of this problem as a situation when research tools are chosen based more on the nature of research problem than on any given philosophy of science. Confirming this view may be a proposition “to take the distinction between positivist and non-positivist as independent of the distinction between quantitative and qualitative, with the consequence that qualitative research can be positivist.”⁶

**Deductive and inductive strategy of theory building**

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⁵ Ibidem
In the previous table, among many differences between paradigms it is asserted that within positivist paradigm researchers are expected to “formulate hypotheses and then test them” while in phenomenological paradigm ideas are developed through induction of data. These two attributes refer to deductive and inductive strategy of theory building. Typical for positivism deductive strategy relies strongly on previous theory, which is being reviewed to find gaps in scientific knowledge and formulate a set of hypotheses which – when tested – will allow to fill in this gaps with new insights. In this extent, deduction means that empirical data are not used to generate hypotheses but to check if they are true or not. It is quite opposite to inductive strategy, which - in its extreme version, characteristic for grounded theory – may call for analyzing some phenomena without any theory whatsoever and then, step-by-step, building the pertinent theory using only empirical data.

The above description doesn’t necessarily mean that a researcher have to choose only one way of building theory. It is possible - and often necessary, or at least advisable - to merge both strategies in one research project. This approach is consistent with the concept called “methodological pluralism”. The figure below illustrates the idea of using multiple case study method first to inductively generate hypotheses and then verify them in a deductive manner.

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The graph suggests that case study can be used, in inductive mode, to better explore research problem. As can be seen, every successive case increases theoretical knowledge of the researcher, by making it possible to elaborate preliminary research questions and hypotheses. In other words, lines of inquiry of every case are based on research results from all previous cases. At some point – in the graph after the fourth case – the researcher may decide that theoretical proposals are developed well enough to proceed to the second phase: verification. It must be stressed that at the end of inductive phase a resulting theory should explain investigated phenomena in all studied cases. Verification is based on comparing data from additional cases to a set of theoretical proposals – hypotheses – generated beforehand. Now it is quite easy to falsify a hypothesis – just one opposing case will be enough to make the researcher to either modify the hypothesis to accommodate new data or to discard it altogether. Even if every case provides affirmative data, which confirm the proposed set of hypotheses, the researcher cannot be absolutely certain that their theoretical proposal is universally true, however the more cases substantiating the theory the more likely it is to hold for the larger set of observations. It is although impossible to provide any estimates of this

**Figure 1:** An example of case study usage in inductive and deductive theory building in a single research project

likelihood – for this it would be necessary to apply quantitative method with its inferential statistics.

The inductive orientation of qualitative research may also be useful for positivism oriented scholars. Jacques Hamel, for instance, proposes that “before a theory can be validated, it must be constructed. In other words, a theory or theoretical framework first emerges through the inductive approach of studying an empirical case or object, not through a deductive process”\(^8\). It follows then that theories are at first based on a specific case or object. It is then rational to employ qualitative research to help generate a set of theoretical propositions and then put them to the test on a large sample of observation using a quantitative technique.

It must be stressed that not only qualitative method can utilize both inductive and deductive approach. Quantitative research is usually structured according to deductive strategy but when objective is exploration of some research problem elements of theory will be constructed in an inductive way, in which case survey may contain a significant proportion of open ended questions and be conducted on smaller sample sizes.\(^9\)

**Generalizing results**

Among the most distinctive differences between two types of methodologies is the manner in which results are generalized. **Quantitative research studies** involve numerous samples which are supposed to allow to draw conclusions about the general population from which they were drawn by the way of **statistical generalization**. To make it possible however two crucial conditions must be met: the sample size must be large enough and selection procedure must be random. In literature there can be found many proposals of random sampling plans which accommodate characteristics of different sampling frameworks (data sets from which observation are drawn). Their common feature is the fact that each population member must have known (usually the same) probability of being selected. In this type of generalization conclusions are being drown with help of inferential statistics procedures. They always give a specific measure of error and accuracy of verifying a given hypothesis, which are known as a level of significance and confidence level. They indicate the likelihood of the results obtained for the sample not being true for the whole population (level of significance) and probability

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\(^8\) Hamel J.: Case Study Methods, SAGE Publications, USA, 1993.

that the results from the sample are also valid for the population (level of confidence). Although this kind of generalization is being rarely questioned by scientists, the mechanical nature of statistical procedures and typically short and shallow contact with respondents makes it not difficult to draw erroneous conclusions about the population. This problem is being described in the following words by Mark Easterby-Smith, Richard Thorpe and Andy Lowe:

“However any results that show relationships should be examined carefully before claiming causality, because there are many ways that spurious associations can be produced. And it is worth remembering that statistical significance does not necessarily imply practical significance or causality, it merely indicates that there is a strong pattern between the variables under consideration.”

Besides errors of judgments, which the above quotation refers to, quality of generalization, or external validity, can be further diminished by various mistakes, especially in sampling procedure. Such a mistake would be selection in which not all members of the population have a possibility to be drawn; this will cause the research results to be biased in favor of opinions and facts provided by those groups of respondents who were most likely to land in a sample. Other example I can give would refer to a situation of using phone directory as a sampling frame in a telephone survey. In this case the results could be projected only to the population made up by people listed in the phone directory and not all those who live in specific area. In this way findings which are - for example - supposed to describe public support for political parties may very weakly correspond to real public election results in a certain area. What is even more troublesome this kind of mistake cannot be quantified using statistical techniques.

Entirely different type of generalization is applicable to case studies, and other kinds of qualitative research. Robert Yin calls it analytic generalization\(^\text{11}\), while Robert Stake labels it petite generalization\(^\text{12}\), as opposed to grand generalization, which is a different name for statistical generalization. Analytic generalization has as its goal “to expand and generalize


theories and not enumerate frequencies”.

It is a very similar approach to experiments, in which “scientific facts are rarely based on a single experiment; they are usually based on a multiple set of experiments that have replicated the same phenomenon under different conditions”.

To use replication logic in case study it is necessary to start with a thorough review of existing theory, which should be used to construct a pattern of theoretical propositions (hypotheses) to which empirical results will be compared. If one or more cases provide insights consistent with the pattern it can be claimed that replication took place. The more cases produce replications the stronger is confidence in new theory elements expressed in the pattern as hypotheses.

Using replication logic quite naturally calls for the purposeful case selection with respect to information value of potential research units for the whole project.

Analytic generalization can also change a theory validated by statistical generalization. It happens when a case study provides a counter-example to the incumbent theory. Then it may be necessary to modify the previous statistical generalization. However a positive example will not be able to change existing theory; it can only increase confidence of scholars in this generalization.

In the extreme situation, this type of generalizing can produce what was called by Karl Popper falsification, which can be illustrated with the well known “black swan example”: if there were a theory asserting that “all swans are white” it would be enough to have just one observation of a single black swan to falsify this proposition. This points at how useful can be generalization conducted with only one well selected case.

Some scholars believe that the important benefit of theory created with analytical generalization is its practical usefulness and understandability for managers. In this extent it is believed to be better than quantitative approach, which is often blamed for widening the gap between what science has to offer and what practice really needs.

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14 Ibidem
17 Ibidem
Other considerations in choosing between qualitative and quantitative approach

Regardless of personal preferences for specific scientific paradigm and inquiry process, in my opinion the two most important issues in determining strengths and weaknesses of research methods are results validity and resources requirements. These research quality and practicality criteria are strongly context dependent, which basically means that the nature of research problem and conditions in which the inquiry is to be undertaken will make qualitative or quantitative approach or some kind of mix thereof the best way to conduct the investigation.

The complexity of research problem, understood as the number of variables in studied relationships, is one of defining conditions for selecting research method. It is quite typical for quantitative research methods to be applied where the objective is to search “for cause and effect relationship between a small number of variables; in comparison qualitative approach strives “for understanding the complex interrelationships among all elements present in a particular case”. When conducting survey research problem, hypotheses and research questions are being translated into research tool which is questionnaire. A single question in a questionnaire, containing a single measuring scale, attempts to gather data about levels of only one variable. When a question contains multiple scale, such as Likert or Staple scale, as many variables are studied as there are scales used. In my experience a questionnaire to be effective data collection tool should not contain more than 100 variables, which usually takes up to 6 pages of paper. This rule of thumb applies to most typical research situation when respondents are not particularly interested in answering questions and treat the interview as a kind of intrusion into their private life. If we were to use a very long questionnaire it will most likely diminish quality of gathered data, as a significant number of most uninterested respondents will try to finish interview as quickly as possible by providing the most straightforward and not thoughtful answers. This may introduce a significant error into collected empirical material, which will be impossible to estimate by any statistical and other techniques available to quantitative researcher. I would then suggest that when a research problem is a complex one, containing more than 100 variables and a sizable portion of potential respondents are likely to be uninterested and even bored by the research subject it

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20 Ibidem
may be a reasonable idea to conduct a few in-depth investigations using multiple case study methodology instead.

The resources factor can be particularly important for researchers conducting their inquiry singlehandedly, which applies to most PhD candidates. From my experience, I can tell that it is usually too hard a task for a single person to study more than 10 cases, with the approach of in-depth rich analysis of multiple data sources within each case. Even if the researcher were to limit himself to less than 10 units, producing rich and convincing descriptions and intensive use of triangulation, the resulting workload is most likely higher than studying similar problem with survey technique. Surveys are relatively quick to complete because of the highly structured form of the questionnaire and the possibility to use well developed statistical analysis techniques, with assistance from statistical computer packages like SPSS. Some of the most time consuming task involved in conducting survey, like collecting data from the field, can be quite cheaply outsourced to hired personnel. Such shortcut will not be possible with case study method, because of its lack of structured research tools and possibility of discovering unexpected insights, which can only be done by the researcher himself, who is the most knowledgeable person on the topic. **Therefore it may be easier and quicker to carry out empirical part of the dissertation with the use of quantitative approach.**

The comparative analysis of both research methodologies, conducted up to this point, can be summarized with the following table.

**Table 2: Major differences between qualitative and quantitative research methods**

<table>
<thead>
<tr>
<th></th>
<th>Qualitative research</th>
<th>Quantitative research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td>Usually theory development based on inductive approach</td>
<td>Usually theory verification based on deductive approach</td>
</tr>
<tr>
<td><strong>Number of research units</strong></td>
<td>One to several</td>
<td>Several dozen to several hundred</td>
</tr>
<tr>
<td><strong>Method of selecting research units</strong></td>
<td>Purposeful sampling</td>
<td>Representative sampling</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Flexible, usually multiple sources</td>
<td>Rigid, usually one source</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Rarely applying statistical techniques</td>
<td>Relying on statistical techniques</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Generalization</td>
<td>Analytic</td>
<td>Statistical</td>
</tr>
</tbody>
</table>

**Source:** Own elaboration

**Conclusion**

I believe that after reading the article it is quite evident that there is no single research approach that would work well in every circumstances and for every research problem. It might be useful to keep in mind the following piece of advice: “the lesson is that no research technique or measurement should be rejected or used a priori; the focus and scope of a project should lead to the research design.”

It is also important to know that in line with the concept of methodological pluralism, scholars should treat the whole realm of methodology as a toolkit, from which they would take whatever seems to be optimal for the inquiry at hand. To do so, I would encourage researchers not only to specialize in one approach, but to develop skills in both methodologies, which should give them flexibility instrumental in producing high quality research results.

Closing discussion of research methods I would like to provide readers with a graph that, in my opinion, shows three the most important strengths of both survey and multiple case study research.

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Figure 2: Three most important advantages of multiple case study and survey method

**Case study**
- Is especially useful in studying contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident.
- It is a valuable technique when complexity of research problem makes it difficult to design standardized inquiry instruments and when answers are contained in multiple data sources.
- Is adequate for research projects which attempt to explain mechanisms and outcomes of certain phenomena.

**Survey**
- Is preferable to other methods when the research goal is to describe the incidence or prevalence of a phenomenon or to formulate predictions about certain outcomes.
- Is widely accepted among scholars of economics and management as a valid research approach.
- The fundamental method of data analysis are highly standardized statistical techniques, which makes the analysis easier and faster.

**Source:** Own elaboration

I hope that the above graph will make it slightly easier for the readers to select the best method for any given research problem.
Bibliography

5. Hamel J.: Case Study Methods, SAGE Publications, USA, 1993