Internationalization and Quality of Higher Education, A closer look at the impact of Cultural Diversity

Version 1

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Abstract

Internationalization becomes increasingly important in our society and hence in higher education. Governments around the world strongly endorse internationalization. Part of research universities' response to this is to create policies that aim to attract international students. If successful, this will increase the cultural diversity at their institutions, which in turn is said to increase the quality of higher education at their institutions. The question remains whether this is true, hence the main research question the thesis aims to answer is: To what extent does cultural diversity influence the quality of higher education of European research universities? It tests the hypothesis that a higher degree of cultural diversity improves the level of quality of higher education at research universities. This thesis tests whether the hypothesis holds while comparing European countries (macro level) and research universities on national level (meso level). Results show that there seems to be a correlation between cultural diversity and the quality of higher education as the main hypothesis is tentatively confirmed by the data. An outcome of this thesis is a recommendation for research universities from the United Kingdom, and from similar countries. These institutions should try to adopt a minimum degree of 20 % international students at their institution.

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Chapter 1: Introduction

This chapter introduces the problem this thesis will be dealing with. It starts by laying out ground notions of the rationales behind internationalization and internationalization itself, which will be further explained in the next chapter.

At the core of internationalization there lie rationales. Rationales are essentially trains of thought that appear logical, seeming to have been thought through. There are many rationales for internationalization which can be divided in several categories. De Wit (1999) provides four categories to classify rationales: political rationales, economic rationales, social and cultural rationales and academic rationales. This thesis will work within the realm of academic rationales.

Many research universities have created internationalization policies, based on rationales within the academic rationales' category. Taylor (2004) identified that the universities are aspiring to attain international excellence, and that this will provide a benchmark for research and teaching, and enhance quality. Some examples of the academic rationales are: increased international awareness of deeper engagement with global issues by students, strengthening institutional research and knowledge production capacity, as well as improved quality of teaching and learning (Seeber, Cattaneo, Huisman & Paleari, 2016). Improved quality of teaching and learning, is the hypothesis I will look at more closely.

These rationales are clear statements that speak to the benefits of internationalization.

One part of internationalization, is to attract more international students in order to improve the quality of higher education of the research universities, a trend we also see in firms and other institutions, in order to promote quality and boost innovation.

Cultural diversity seems to be a desirable goal to attain. In 2001 already, UNESCO published a universal declaration on cultural diversity that states that cultural diversity is to be seen "[…] as a process guaranteeing the survival of humanity;" (UNESCO, 2001, p.1). The declaration itself, as well as the fact that it was unanimously adopted, highlight the importance of cultural diversity in the international arena. It seems this message has penetrated society and this is amongst others reflected in knowledge institutions such as research universities.

If we research deeper into the existing literature, we start to notice that it does not seem to be as straight forward as initially thought. One starts to notice that there might be some pre-existing conditions like the level of education that influence the effect of cultural diversity on for instance firm innovation or quality of higher education. Ozgen, Nijkamp and Poot, researched the impact of cultural diversity in firm innovation, and found that "Generally speaking, a larger share of foreigners among a firm's employees lowers the innovativeness of firms" (Ozgen, Nijkamp, & Poot 2013, p. 19). This seems to be counterintuitive and contradicts with the previously mentioned rationales laid out by Seeber et al. (2016), begging the question whether aiming for a higher degree of cultural diversity is the right choice for research universities.

I will look at the influence of cultural diversity, as specific part of internationalization, on the quality of higher education in order to clarify the relationship. Should the data allow, I will also try and find an optimum. It would be interesting to see whether there is a certain degree of cultural diversity research universities might strive for in order to maximally improve the quality of their higher education. This thesis will provide an answer to the research question on a macro and meso level, with the aim to see whether the relationship holds on national and institutional level.

1.1 Background

In this part of the thesis I will provide background as well as some understanding of the context surrounding the main questions asked in this thesis. Within this chapter I will expand the foundation presented in the introduction by further explaining internationalization and the idea of rationales, after which I will present my research questions and shortly elaborate on the social and scientific relevance of the thesis.

1.2 Internationalization

Within the existing body of literature there are many definitions of internationalization that seem to provide a fair concept of internationalization. I will however start with the often used definition of Jane Knight (1994, p.3) who states that internationalization is: "the process of integrating an international perspective into the teaching/learning, research and service functions of a university or college". From this point on, it is important to understand what internationalization is and what kind of changes it brings.

A more elaborate definition is provided by Ellingboe (1998; as cited in Taylor, 2004, p.151) as she identified what to her, are integral parts of internationalization.

- College leadership;
- Faculty members' international involvement in activities with challenges, research sites and institutions worldwide;
- International curriculum;
- The availability, affordability, accessibility and transferability of study-abroad programs for students;
- The presence and integration of international students, scholars and visiting faculty into campus life; and
- International cocurricular units (residence halls, conference planning centres, student unions, careers centers, cultural immersion and language houses), student activities and student organizations.

Out of these factors determined by Ellingboe, one stands out, this is something undeniably connected to internationalization, and can be found to always be a key factor of internationalization as well. This would be the presence of international students, which can be found to be a key factor in other literature as well, "Student mobility is one of the best developed areas of national-level policies on international higher education" (Ilieva, & Peak, 2016, p.4). Whichever way one looks at internationalization, to anyone, whether connoted positively or negatively, this means the presence of international individuals. Hence the focus of this research will hinge on the presence of internationals, specifically international students at research universities.

Taylor (2004) states that "Internationalization has become an indicator for quality in higher education, and at the same time there is more debate about the quality of internationalization itself". This implies that internationalization itself is actually able to be introduced with several different focus points by different institutions. This can also be found in international rankings using several internationalization indicators to judge a higher educational institutions' quality.

1.3 Rationales

As mentioned above, the notion that factors of internationalization, such as the presence of international students improve the standing of a research university on a global scale by for instance making research universities more competitive, is based on rationales.

As mentioned before there are many rationales for internationalization. Seeber et.al. (2016) provide some rationales that are used as reasons for universities to internationalize. Such rationales provide an explanation to why internationalization and its factors, have a positive influence on for instance the quality of teaching and learning at a research university. De Wit (2002) identifies four main categories in which these rationales can be gathered: political rationales, economic rationales, social and cultural rationales, and academic rationales.

Political rationales entail the rationales that explain how internationalization may lead to international peace, and better cooperation. Rationales from this category have been used for example when the United Nations was founded in 1945, where the intention was to create more international cooperation, and through this control each other and prevent another war of the scale of the second World War.

Economic rationales for internationalization entail the ideas of economic growth and international competitiveness. It expects financial growth through internationalization. De wit (2010) states that these rationales "have come more to the forefront in present-day globalization of our economies" (de Wit 2010, p. 9).

Social and cultural rationales are the rationales that promote intercultural understanding and intercultural competence, it teaches the individual to be less provincial and more knowledgeable about the world.

And finally academic rationales, this is about increasing international aspects of research and teaching, increasing the quality of ones institution by adhering to international standards. This will be the realm out of which the rationale has come forth that will be tested in this thesis. To be explicit, the assumption based on the academic rationale is that having more international students at a university increases the quality of higher education.

1.4 Research Question

As stated I will look at the connection between cultural diversity and the quality of higher education. To give the thesis a focus, it has been chosen to concentrate on European countries and on research universities, since the latter have more comparable data available than university colleges.

The research question are as follows:

RQ: -To what extent does cultural diversity influence the quality of higher education of European research universities?

The research question can be broken down into three sub questions:

SQ1:   -What is cultural diversity in higher education and which conceptual elements is it associated with?

SQ2:   -What is quality of higher education at research universities and which conceptual elements is it associated with?

SQ3:   -Is there an optimum of the degree of cultural diversity to improve the quality of higher education.

The main research question is clear, it searches a correlation, if possible even a causation, between the two main concepts. However to answer this question, some sub questions are needed. The first two sub questions are quite straight forward and they ask for a conceptualization of cultural diversity and quality of higher education at research universities. The third sub question is a more intricate question. Does the quality of higher education of a research university keep on increasing with the rise of cultural diversity at that institution, or is there an optimum of cultural diversity to improve the quality of higher education? Assuming that cultural diversity improves the quality of higher education, the question remains whether or not this is a simple linear relation. In other words, is there a point from which on the degree of cultural diversity is rather hindering the quality of higher education of a research university instead of stimulating the quality of higher education.

1.5 Social and scientific relevance

"Many of these developments in higher education arise for a variety of reasons, and here are many other factors influencing institutional change. It is clear, however, that internationalization represents one of the most significant drivers of change facing the modern university" (Taylor, 2004, p20). This perception hints at the main reason why this thesis is relevant. If we look at research university strategies, for instance the internationalization strategy of the University of Twente (2015) or the University of Uppsala (2016), we notice that they both aim to take in more international students and it is no different for other research universities. It becomes more important when we notice that research universities attract more international students, without having researched the impact of these actions, but rather base these actions on previously mentioned rationales. Nevertheless there is a certain accountability for research universities. Research universities invest in the recruitment of students and they allocate funds and stipends to international students. It will be important to know whether the allocation of such funds is justified, especially considering that the accessibility of higher education for national students may decline because more seats are awarded to international students.

This thesis explores the relationship between cultural diversity and the quality of higher education. It adds to the scientific debate surrounding the topic of internationalization and its impacts by connecting cultural diversity to the quality of higher education. Whatever the result might be, this research will improve our understanding of the relationship between cultural diversity and the quality of higher education and through this opens up a path to more research. Especially considering that the body of academic literature surrounding the influence of cultural diversity on the quality of higher education has been sparsely explored making this a niche for research in our understanding of the cultural diversity paradigm.

Chapter 2: Theory

In this part of the thesis I will discuss the concepts of cultural diversity and quality of higher education, then I will lay out the conceptual models from which several working hypotheses will be created to answer the research question.

2.1 Concepts

The first concept is cultural diversity; this concept already exists of two separate smaller concepts, on the one hand culture, and on the other hand diversity. I will first elaborate on diversity, and will later on discuss culture, and will then elaborate on cultural diversity. Next will be the concept of quality in higher education, after which I will present models that identify relationship between cultural diversity and quality of higher education from which I will extract hypotheses which I will present in the final part of the theory.

2.2 Culture

There are many levels to consider while talking about culture and there has been a lot of research regarding the concept. Hofstede, (1991), calls culture, the software of the mind, and states that this software is a result of the upbringing within a country. Hence creating a national dimension regarding culture. Culture might differ between two villages, but in a European context this is hard to measure. Since I am looking at European research universities, and in the spirit of this thesis, I will define culture along the lines of national cultures, rather like Hofstede uses in most of his work, (e.g. Hofstede 1991). Therefore, although cultural differences may already exist between two locals with different upbringing and still exist if we look at Asian versus European cultures, looking at national cultures will give us a good comparison while addressing research universities within different European nations.

2.3 Diversity

Diversity is a broad and contested term (Holmgren & Jonsson, 2013). Nevertheless, Holmgren and Jonsson (2013) distinguish between two main streams. On the one hand the researchers that define diversity in the sense of race and ethnicity, and on the other hand, the ones that state that diversity is everywhere within the society, languages, physical abilities, sexual orientation, et cetera.

Stirling (2007) uses three aspects of diversity; Variety, how many different things, balance, how many of each and disparity, the amount to which these things differ from one another. In the context of this thesis this would mean variety is the number of different cultures, balance is the percentage foreign students to native students, and disparity is the amount to which the cultures differ from one another. Variety balance and disparity give a clear understanding of the concept of diversity. Where most definitions of diversity would encase variety and balance, this definition does cover disparity as well.

In the context of this study, it will be most useful to see diversity as race and ethnicity, because this is the diversity sought through attracting international students. Moreover, it is assumed that institutions not only seek international students from one country, but rather a variety. Therefore, we are to consider

the variety and balance to represent diversity, leaving out disparity since it is very difficult to quantify within the framework of this thesis, the expanse that different cultures differ from each other.

2.4 Cultural diversity

Putting both concepts together we get cultural diversity, the different cultures that exist at research universities next to the dominant culture where the culture is defined along national lines. Following this, the concept of cultural diversity becomes, in case of this thesis, the amount of different nationalities at a university. Ranaivoson (2013) uses the Stirling model to measure cultural diversity. As previously mentioned, there are three dimensions to diversity within the Stirling model. Variety, balance and disparity. Added to the notion of national cultures, variety becomes the number of different cultures, balance will be the division of students among the different cultures divided up between foreign and national students (as in percentage of international students), while disparity would be the level to which the different cultures differ from each other. This can be understood as for instance on the one hand Dutch and Belgian culture being quite similar, having a low degree of disparity, while on the other hand German and Chinese culture having a high degree of disparity. However, the notion of a measure that distinguishes between cultures as being nearer and farther from one another, though useful is not within the realm of this thesis. Therefore the concept of cultural diversity will consist of the balance and variety. Hence for instance 15% international students from 7 different countries of origin.

2.5 Quality

The other concept is the quality of higher education. Harvey and Green found that stakeholders' views on quality could be categorized according to five broad definitions: quality as exceptional, quality as perfection, quality as fitness for purpose, quality as value for money, and quality as transformation. The diversity concerning definitions of quality has also been echoed by a vast number of organizational manifestations of quality. In higher education, organizational practices related to quality can be found in various types of national quality assurance schemes, as for instance accreditations, evaluations, audits and assessments (see e.g. Frazer 1997). Yet also within higher education institutions in the form of institutional quality assurance systems where evaluation systems, information systems, and management systems are combined in various ways. In one of the earliest classifications of the different approaches to quality assurance, Dill (1992) distinguished between three forms: the reputational approach, the student outcome approach, and the total quality (management) approach. The first approach uses the peer review mechanism to assess (and sometimes rate) the quality of programs and institutions. The second approach is based on measurement of outcome indicators of student achievements both when attending higher education, and also afterwards (career, earnings, etc.). The third approach stresses broad participation, client orientation, organizational learning, and coordination. It is important to notice that the quality of higher education is an experience good, "An experience good is one the quality of which can only be judged after consumption" (van Vught, Westerheijden, 2012, p.12). Therefore it will be important to use indicators that measure quality after consumption, leading us to seek for indicators rather following the first and third approach used by Dill (1992). This means that higher education quality is expressed in peer reviews of programs, known as accreditation, and in outcomes of higher education, as expressed in student satisfaction, employment outcomes, learning outcomes etc.

It is harder to measure the quality of higher education at an institution than to measure the cultural diversity as laid out before. Adams (1993) states that (1) quality has multiple meanings, (2) quality is dynamic, because it changes over time and by context, (3) quality may be assessed by either quantitative or qualitative measures, and (4) quality should be seen within a certain context. Following this argument, within the context of this thesis, several sources can be used to measure quality of higher education. First, many university rankings exist, however they tempt to look merely at indicators that identify the quality of the research aspect of the institutions, such as the number of publications and the number of citations, Some of these ranking, like Times Higher Education and u-multirank, already possess indicators for educational quality. Rankings like these might be the ones I could use in order to measure this concept. Second, an option would be to look at student satisfaction as an indicator of quality higher education. Third, use a pre-existing rankings that seem to combine many indicators to describe the quality of higher education. Fourth, another indicator could be Accreditation scores instead of rankings. Depending on the level of measurement, the data will be different, on this I will elaborate in the section on the research design of this study.

2.6 Models:

The first model assumes the common expectation. According to rationales as laid out by Taylor (2004) and Seeber et al (2016), cultural diversity is expected to boost the quality of higher education. Figure 2.1 shows the main hypothesis, it is the working hypotheses behind many rationales of research universities to attract more international students in order to generate more diversity which is expected to lead to a boost in the quality of higher education of these institutions. This model shows whether there is a correlation between the two variables.
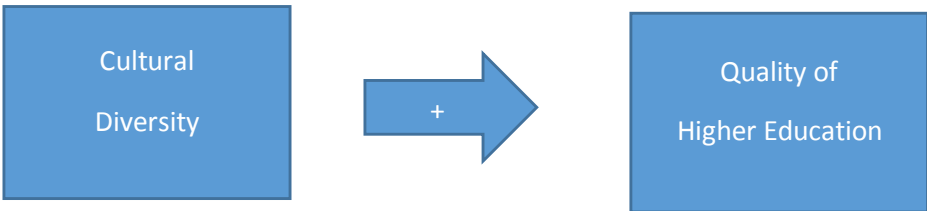

Figure 2.1: Cultural diversity positively influences the quality of higher education, model 1.

The second model (Figure 2.2) assumes the opposite to the first model. It works under the assumption that students who go abroad are drawn to research universities that already have a high quality of higher education, hence increasing the cultural diversity of that institution. Akareem & Hossain (2016) argue that creating a certain quality of higher education can attract foreign and retain local students. This seems to be more relatable and a more direct approach to the relationship between cultural diversity and the quality of higher education. This model shows a direction to the relationship that will explain whether a causation exists, and what variable causes the other.
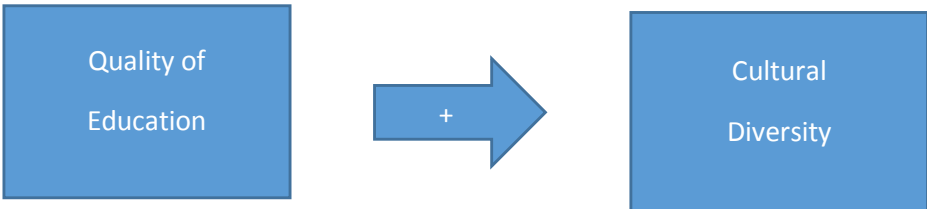
The last model (Figure 2.3) assumes that both previous linear models are not a correct interpretation of the relationship between cultural diversity and quality. Instead it expects a squared correlation.

This model has been created in order to test the third sub question, whether there might be an optimum to the influence of the level of cultural diversity on the level of quality. Meaning that if the cultural diversity of students of a research university rises, then the quality of higher education of that research university will rise as well, this however tends to only hold true until a certain threshold (called an optimum) is passed, after which, if the cultural diversity of students of a research university rises further than the optimum then the quality of higher education of that research university will fall. This model explores a bit deeper that a linear regression, and whether found true or not, will help to increase our understanding of the relationship between cultural diversity and the quality of higher education.
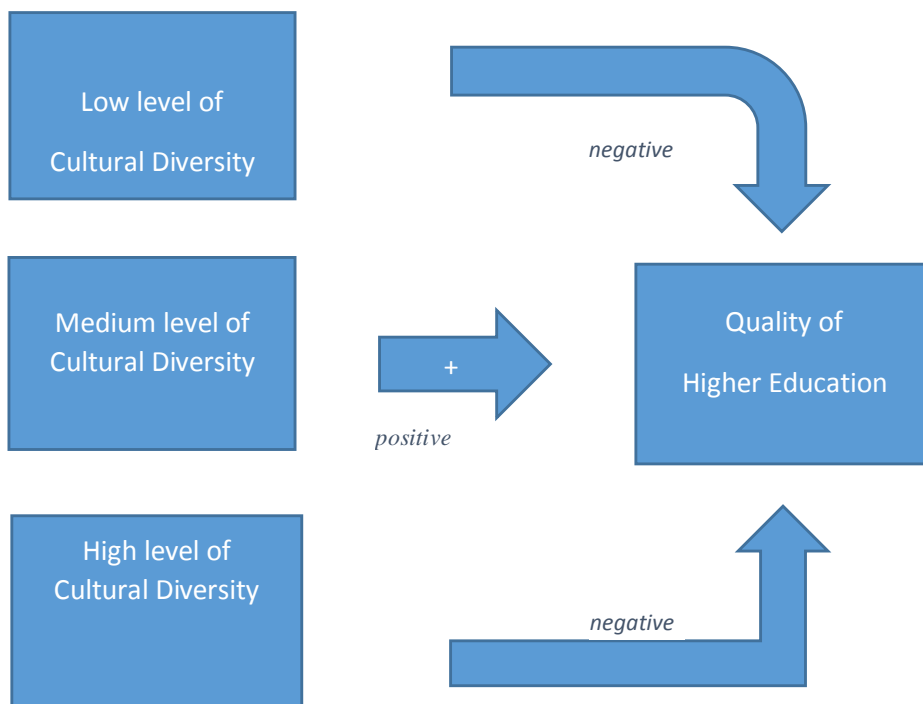

.   *Figure 2.3: illustration of a squared correlation; only a medium level of cultural diversity will have a positive effect on the quality, model 3.*

2.7 Hypotheses

After having elaborated on the concepts and discussed the models, I will now discuss the hypotheses that will be tested in this thesis. The research question looks at the relationship between cultural diversity and quality of higher education. In order to thoroughly research the relationship, it is important to test for a correlation to see whether or not there exists a relationship. Of similar importance will be the direction this relationship is in. This will show if there is a causation, and inform about the passage of time, to see what variable causes the other. Last, it will be important to test for spuriousness. To see whether any other variables influence the found relationship, and thus disprove the relationship that has been found thus far. I have presented three models within the theory, from these three models I have derived three hypotheses.

The hypotheses I will be testing are:

H1:   If the cultural diversity of students of a research university rises, then the quality of higher education of that research university tends to rise as well.

H2:   If the quality of higher education of a research university rises, then the cultural diversity of students of that research university tends to rise as well.

H3:   If the cultural diversity of students of a research university rises further than the optimum then the quality of higher education of that research university will tend to fall, as opposed to rising further.

Chapter 3: Research design

The intention of this research is to examine the relationship between the two variables cultural diversity and the quality of higher education. It uses several hypotheses to guide the research. The hypotheses cover the three criteria for nomothetic causality, 1: the variables must correlated, 2: the cause takes place before the effect, establishing a time order and 3: The variables are nonspurious, there is no third variable accounting for the association (Babbie, 2013). This should lead to a clear understanding of the actual relationship. In order for this research to be conducted properly I decided to – where possible – use a longitudinal research design, it will be an important tool to determine the time-order. The first model described in the theory suggests that cultural diversity positively influences the quality of higher education, this needs to be tested. I aim to get data from 2001 until 2016. Although cultural diversity already was an issue before 2001, the declaration from UNESCO in 2001 strengthened the acceptance of the concept and the rationales connected to it.

I will use quantitative data, mainly taken from university rankings. This thesis will include measurements on macro and meso level. It will test whether the main hypothesis will hold for both levels. Also the effect can potentially only be seen on an aggregated level. Therefore, to better explore the effects of cultural diversity on the quality of higher education I will include these two levels. On the macro level I will compare countries to each other by ways of comparing the quality of their research universities and the level of cultural diversity. Then to measure the meso level, I will compare universities to each other within a country. Since I will test whether the theory will hold on macro and meso level, I will use different data for both levels. I will elaborate on the data I aim to retrieve as well as the methods I will use, in the sections of case selection and sampling and operationalization.

The greatest threat to this kind of research is spuriousness, hence it will be important to test for non-spuriousness. This would mean that the relationship would not be genuine, If I find a relationship between cultural diversity and the quality of higher education and think that this would be a causation, this might not be right, since there might be a correlation only. The data gathered is panel data, this means that several cases are chosen, and they would have data for the same indicators over several years. This kind of data has been especially chosen to control for spuriousness, by introducing a time factor.

The possible data sources in this case would be rankings, like "Times Higher Education" and "u-multirank" since these kinds of rankings have a measure for the quality of higher education. If possible, data regarding nationalities of their students could come from the research universities themselves, as well as statistics agencies.

3.1 Case selection

As mentioned before, the case selection and sampling will differ per measurement level. Each measurement level requires a measure for cultural diversity, and a measure for the quality of higher education that corresponds to the measurement level.

For both levels, I will first determine the units, the variables and the settings, and then I will explain how the cases will be chosen, after which I will identify the chosen cases.

For the macro level, the setting is Europe. I will be comparing countries, the variables are cultural diversity and the quality of higher education. This is quite straight forwards. Hence the cases will be all European countries that have research universities within the top 200 of the Times Higher Education rankings. The Times Higher Education World Ranking has been chosen over u-multirank because at the moment the data available here reaches back further in time.

To determine the impact of cultural diversity on a macro level, I will use the number of research universities as a percentage of the respective nations' total number research universities, per European country in the top 200 of a ranking to determine the quality of higher education, while using a country based table that provides the percentage of all students, being foreign to the country, per country in order to determine the degree of cultural diversity.

For the meso level the setting is the United Kingdom. This country has been determined through a combination of the number of research universities in the top 1000 and the distance between the highest and lowest ranking. The units are research universities, which will be the all ranking universities of said country within the top 1000.

To determine the impact of cultural diversity on a meso level I will compare all research universities for one country that will be in the top 1000. I aim to use the research universities position within the ranking as an indicator for quality of higher education. The cultural diversity variable will be provided by the percentage of foreign students at the institution and the number of cultures that attend the research institution. This will be done with the country that has the highest difference of positions between its highest and lowest ranking universities within the top 1000, given there are at least 30 research universities of that country within the top 1000. This is done in order to compare different levels cultural diversity to the respective levels of quality of higher education.

Here I will use the student's satisfaction as an indicator for the quality of higher education and once more the percentage of foreign students and their distribution amongst nationalities to determine the degree of cultural diversity.

Level	Units	Indicator CD	Indicator QoE	Setting	Data analyzing method
The macro level	Countries	% foreign students studying in tertiary education in the country	% of countries' research universities in top 200	Europe	Linear regression Pearson's r
The meso level	Research Universities	% foreign students studying in tertiary education in the institution	Rankings	United Kingdom	Linear regression Pearson's r ANOVA

Table 3.1: units, variables, indicators and setting per measurement level.

Cultural diversity will always be measured by the percentage of foreign students and the number of different cultures, if available. The level of measurement of cultural diversity will always correspond to the level of measurement of quality education.

Since potentially the relationship can only be seen on an aggregated level, it will be measured at these two levels. Measuring on these two levels will also give insight into the impact of cultural diversity on the quality of higher education at research universities. Also, these two levels allow to narrow the focus on the quality of higher education, nearing a clearer image of the concept. Also noteworthy is that while focusing on a deeper level, more external variables will be controlled for. As for instance the GDP of a country

All the date I will retrieve will be quantitative data, these will be appropriate to answer the questions posed in this thesis. All data will be taken from existing datasets and will not intrude on personal boundaries, no personal data is needed to answer this question since this thesis' main aim is to understand the relationship between cultural diversity and the quality of higher education rather than to understand the reasons behind relationship.

3.2 Operationalization

After having gathered the data, a data set is compiled as set out in the case selection and operationalization. Then this data has been treated a set out in the data preparation section of this chapter.

The aim of the thesis is to test the relationship between cultural diversity and quality, on part of this is to subject it to a test for the Pearson correlation to look at the direction of the relationship. This should allow me to look for a correlation coefficient between -1 and +1, where 0 would mean no correlation and +1 and -1 would mean perfect correlations that include a direction. It is important to notice that this direction does not describe whether the independent variable influences the dependent variable or the other way around, but rather indicates whether the influence of the independent variable on the dependent variable is positive or negative.

Both the macro level and meso level consist of panel data, this is due to the longitudinal nature of the collected data. This means that the linear regression has been done once normally, and once treating the data as panel data. All linear regressions (macro level, normal data and panel data and meso level normal data and panel data) are done with dummy variables consisting of low and medium levels of cultural diversity. Also a squared cultural diversity variable has been made that helps to search for a squared relationship to test the third hypothesis.

The meso level offed itself to be tested with an analysis of variance, ANOVA. The universities were divided in three levels of cultural diversity (<20%, 20%-40%, and >40%) in order to check whether or not there is an actual difference within the respective levels of quality of higher education.

3.3 Data preparation

In order to gather the dataset for this study, several sources have been used, in this paragraph, I will introduce the data, show where it came from, as well as how it has been prepared for analysis

The data that I found and used is the following:

For the macro level, I used the Times Higher Education world university ranking, it provides data from 2011-2017 these data consist of a ranking of up to 981 separate universities. I counted the amount of universities within the top 200 of each European country and presented it as a percentage of the country's total number of universities per year. This makes up the dependent variable of the macro level.

The independent variable on macro level is the percentage of international students per country. This is derived from the number of students in tertiary education per country and number of international students in tertiary education per country, the data is coming from UNESCO.

As a test variable, the Gross Domestic Product of each country per year has been introduced. The data has been found on World Bank open data. In order to use is, and make it more manageable, the natural logarithm of the GDP has been created and tested with the data.

For the meso level the data consists of every single university of the United Kingdom in the top 981 of the Times higher education world university ranking. This resulted in data of 92 universities. I collected the ranking position, as well as the amount of international students at those institutions. Because often the position of a research university has been indicated within a range, e.g. 301-350, I chose to average the score to represent the position, in this example 325.5 since I needed a concrete position in order to analyze the data.

In order for the ANOVA analysis to work, the data has been divided in three levels of % of international students, low (<20%), medium (20%-40%), and high (>40%). There, being 92 cases of universities of the United Kingdom, are plenty cases to make an analysis of variance which might allow me to draw a conclusion, unfortunately however, for both measurement levels, the variety as an indicator for cultural diversity, could not be determined, on this I will expand in the limitations part of the thesis.

For the linear regression on both macro and meso level, dummy variables have been made that allow for a more intricate analysis. On both the macro level and the meso level these dummy variables have been made for the variable of cultural diversity. The cut off points at the macro level are at 5.79% and 13.62% and on the meso level the cut-of points are at 20% and 40%. This is done to see how the changing variables influence the coefficient related to the hypotheses within different models. Also, the cultural diversity variable has been squared as one variable, in order to detect a possible answer to the third sub question, searching for a possible optimum.

Chapter 4: Data analysis

In this chapter the data will be presented, at first I will describe the data, and then explain what these data imply. Initially I will provide some descriptive statistics, after which data on correlations will follow. Next I will provide the linear regression, performed under several models, as well as repeated the linear regression while treating the data as panel data. The next step, in case of the meso level is the analysis of variance. I will first start with the analysis of the macro level, and later on describe the meso level.

4.1 Macro level data

First presented are the descriptive statistics of the data used on the macro level. As shown in table 4.1, we can see three variables, the independent variable: Intern-s, (representing the cultural diversity of a country): the dependent variable: ofun-200, (representing the quality of the institutions in a country); and a control variable: lnGDP, (the natural logarithm of the country's gross domestic product). From top to bottom we first notice N, the number of observations, the mean, p50 (the median), sd, (standard deviation) and the min and max values of the data. As per example of quality, there are 120 observations, the mean is .2477, which entails that on average the selected countries have 24.77 percent of their respective research universities within the top 200 of the Times Higher Education Ranking. The median lies at 0.1599; the standard deviation is 0.2515 and the minimum and maximum are 0% and 100% of a countries research universities within the top 200.

It is apparent that the number of observations are different per variable, this is due to the fact that the data that could be gathered differs per level, for the quality, data has been found stretching over 8 years, encompassing 15 countries without any missing data, resulting in 120 observations. For the control variable, data has been found stretching over 7 years for 15 countries with no missing data, resulting in 105 observations. While for the cultural diversity variable data has been found stretching over 6 years for 15 countries having 14 missing data values.

stats	Intern~s	ofun~200	LnGDP
N	76	120	105
mean	.1006332	.2477352	27.22916
p50	.077143	.1599	27.022
sd	.0697216	.2515218	1.080998
min	.028364	0	24.69756
max	.414063	1	28.98667

Table 4.1: Descriptive statistics of the data on macro level (observations, mean, median, standard deviation and minimum and maximum values

Table 4.2 shows the correlation between the independent variable: Intern-s, (representing the cultural diversity of a country): the dependent variable: ofun-200, (representing the quality of the institutions in a country); and a control variable: lnGDP, (the natural logarithm of the country's gross domestic product). The correlation is made with 76 observations. Note that these are 76 observations made over 6 years per 15 countries, which means that there are, in this case 14 missing values, or there would be 90 observations. The correlations are negative; -0.1021 between the independent and dependent variable, -0.2815 between the independent variable and the control variable and -0.0141 between the dependent variable and the control variable. The fact that the signs are negative means, for the correlation between the dependent and independent variable, that whenever one of the variables increases, the value of the other variable decreases, in this case it is as expected, as it is assumed that whenever the cultural diversity of an institution rises, so does the quality of that institution. A rise in quality is indicated by a rise in rank, which means the position might rise from 150 to 130, which in turn is why increased quality is represented negative. This does not translate to the control variable however since a higher lnGDP is represented by the higher absolute number, hence one could imagine that when one variable rises, this results in a lower lnGDP. Still it is important that while this might look like a correrlation, there is no significant proof of to support this.

The introduction of GDP against the percentage of universities within the top 200 of a ranking might seem a bit biased, since some countries having a low GDP in comparison to others, seem to have quite a high score regarding the quality in comparison to others. The correlation even shows a correlation of -0.2815. Meaning that for every rise in cultural diversity, there is a decrease of lnGDP. This is due to the fact that these countries having a lower GDP are comparatively small countries that possess only a few research universities. And of these few universities a relatively high percentage dwells in the top 200 of the university rankings. An example is the Netherlands, it is a small country with a comparatively low GDP yet a high percentage of its universities are in the top 200. This will also appear in the section of limitations.

The ranking between a variable and itself is always 1, this is seen in the cross-section between the variables.

(obs=76)	Intern-s	Ofun-200	LnGDP
Intern-s	1.0000		
Ofun-200	-0.1021	1.000	
LnGDP	-0.2815	-0.0141	1.0000

Table 4.2: Correlation between Quality (Ofun-200), Cultural Diversity (internatio-s) and control variable Ln GDP; values (-1, to +1)

The next step in this analysis is to do a linear regression, as stated before in order to do this regression, some dummy variables have been created, as well as a squared independent variable. The results of this regression is shown in table 4.3. In the top row we can see the dependent variable quality (% of universities in top 200), in the first column, the independent variable, as well as the dummy variables low IS and Med IS and the ISSquared, the squared independent variable. We can see that in a simple linear regression, model (1), this result translates in to y= -0.315X + 0.259 which would indicate a linear relationship that supports the main hypothesis. For any increase in cultural diversity lowers the ranking score, going towards 1. It is important to notice that R-squared, which represents the percentage of variance that can be explained by this model, is very low, making this less significant. Adding the two dummy variables (model 2), the original relationship seems to be maintained, yet R-squared is much higher, explaining much more of the variance. Introducing the squared variable into the model (3&4) his found relationship disappears and even becomes positive, meaning that for any increase in cultural diversity the ranking score is higher, going towards 801.

On this level there is no significance to the cultural diversity, (% international students). However with the introduction of the squared cultural diversity (ISSquare), there is a certain significance as $p < 0.05$. This means that there might actually be a squared correlation.

	(1)	(2)	(3)	(4)
	% of universities in top 200	% of universities in top 200	% of universities in top 200	% of universities in top 200
% International Students	-0.315 (-0.88)	-0.288 (-0.50)	1.509 (1.56)	4.649 (1.99)
LowIS		-0.0645 (-0.58)		0.302 (1.51)
MedIS		0.127 (1.48)		0.336[*] (2.64)
ISSquare			-4.976[*] (-2.02)	-9.349[*] (-2.17)
Constant	0.259[***] (5.95)	0.209 (1.71)	0.150[*] (2.17)	-0.345 (-1.23)
Observations	76	76	76	76
r2	0.0104	0.160	0.0629	0.213

Table 4.3: linear regression following 4 models with interchanging variables (t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$).

Because the data has been gathered as panel data, the same linear regression has been repeated, to look at the influence of the treatment of the data as panel data. The results are displayed in table 4.4. The relationship here is generally positive, y= 0.613X+166, following model 1 through 4, the sign does not change. Noticeable is that R-squared is very low throughout all models, showing that not much of the models variance is explained using this model. This seems to deny the main hypothesis, but there is no significance within the models that suggests any proof of this.

	(1) % of universities in top 200	(2) % of universities in top 200	(3) % of universities in top 200	(4) % of universities in top 200
% International Students	0.613 (1.06)	1.070 (1.45)	0.544 (0.41)	2.171 (1.13)
LowIS		0.0362 (1.00)		0.0519 (1.17)
MedIS		0 (.)		0 (.)
ISSquare			0.360 (0.06)	-4.688 (-0.62)
Constant	0.166^{**} (2.82)	0.110 (1.37)	0.167^{*} (2.56)	0.0657 (0.61)
Observations	76	76	76	76
r2	0.0184	0.0347	0.0184	0.0410

Table 4.4: linear regression following 4 models with interchanging variables, data treated as panel data (t statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001).

4.2 Meso level data

Following the previous steps, first presented are the descriptive statistics of the data used on the meso level. As shown in table 4.5, we can see two variables, the independent variable: InternationalStudents, (representing the cultural diversity of an institution) and the dependent variable: University ranking, (representing the quality of the institutions). From top to bottom we first notice N, the number of observations, then the mean, p50 (the median), sd, (standard deviation) and the min and max values of the data. As per example of Cultural Diversity, there are 528 observations, the mean is 30%, which entails that on average the selected countries have 30 percent of their respective research universities within the top 200 of the timer higher education ranking. The median lies at 29%; the standard deviation is 11 and the minimum and maximum are 7% and 70% of international students at the respective research universities. An N of 528 does not entail that there are 528 research universities from the United Kingdom within the top 1000 of the ranking, but that over the course of 7 years, data has been gathered on 92 research universities from the United Kingdom which are in the top 1000. This means that there are 116 missing observations within this data (over the course of 7 years), these are mainly due to the fact that each year more universities were added to the ranking, hence the universities that were added last, have missing data for the years before they were added.

Stats	UniversityRanking	InternationalStudents
N	528	528
Mean	304	30
P50	213	29
Sd	233	11
Min	1	7
Max	801	70

Table 4.5: Descriptive statistics of the data on meso level (observations, mean, median, standard deviation and minimum and maximum values)

Table 4.6 shows the correlation between the ranking of a research university on the world university ranking, representing the quality of the institution, and the percentage of international students at the matching universities, representing the cultural diversity. The correlation is made with 528 observations. The correlation is negative; -0.433. The fact that the sign is negative means that whenever one of the variables increases, the value of the other variable decreases, in this case it is as expected, as it is assumed that whenever the cultural diversity of an institution rises, so does the quality of that institution. A rise in quality is indicated by a rise in rank, which means the position might rise from 150 to 130, which in turn is why increased quality is represented negative.

(obs=528)	University Ranking~g	Ratio International Students~s
University Ranking~g	1.0000	
Ratio International Students~s	-.4330	1.0000

Table 4.6: Correlation between Quality (university ranking~g) and Cultural Diversity (ratio international students), values (-1, to +1).

The next step in this analysis is also on this level, to do a linear regression. The same two dummy variables, LowIS, MedIS and also ISSquared have been applied. The results of this regression is shown in table 4.9. In the top row we can see the dependent variable quality (Universities Ranking) and in the first column, the cultural diversity, as well as the dummy variables low IS and Med IS and the ISSquared, the squared independent variable. We can see that in a simple linear regression, model (1), this result translates in to y= -9.204X + 566 which would, similar to the macro level indicate a linear relationship that supports the main hypothesis. For any increase in cultural diversity lowers the ranking score, going towards 1. This seems to be also a stronger relationship than on the macro level.

On this level, the R-squared is much higher as well than on the macro level, making the data seem more significant. Adding the two dummy variables (model 2) and the squared variable (models 3 and 4), does not seem to change the original relationship as the different models all provide significant results with p values between 0.05 and 0.001 for each model.

	(1) University Ranking	(2) University Ranking	(3) University Ranking	(4) University Ranking
International Students (%)	-9.204*** (-10.13)	-9.999*** (-6.20)	-23.78*** (-7.10)	-11.47* (-2.41)
LowIS		-38.60 (-0.61)		-43.45 (-0.67)
MedIS		-164.7*** (-4.04)		-161.9*** (-3.88)
ISSquare			0.213*** (4.51)	0.0200 (0.33)
Constant	566.0*** (19.48)	710.9*** (8.60)	787.3*** (13.89)	733.7*** (6.79)
Observations	437	437	437	437
r2	0.191	0.276	0.227	0.277

Table 4.7: linear regression following 4 models with interchanging variables (t statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001)

Because the data has been gathered as panel data, the same linear regression has been repeated, to look at the influence of the treatment of the data as panel data. The results are displayed in table 4.10. The relationship here starts out positive, y= 0.892X+261.9, is stays positive in the first two models. After the introduction of the squared variable ISSquared, the relationship reverts to the negative relationship that seems to follow once more the thoughts of the original hypotheses

Following model 1 through 4 it is important to notice that R-squared is very low throughout all models, showing that not much of the variance can be explained using this model, whether looking at the cases within the panels (r2_w), looking between the panels (r2_b) or the usual R-squared (r2)

	(1) University Ranking	(2) University Ranking	(3) University Ranking	(4) University Ranking
International Students (%)	0.892 (0.61)	0.914 (0.51)	-13.10* (-2.17)	-14.99* (-2.23)
LowIS		15.85 (0.41)		58.15 (1.39)
MedIS		-7.530 (-0.24)		42.00 (1.13)
ISSquare			0.231* (2.39)	0.287* (2.45)
Constant	261.9*** (5.95)	263.8*** (3.58)	447.5*** (5.02)	408.0*** (4.35)
Observations	437	437	437	437
r2	0.00108	0.00586	0.0174	0.0231
r2_w	0.00108	0.00586	0.0174	0.0231
r2_b	0.165	0.00125	0.00184	0.00456

Table 4.8: linear regression following 4 models with interchanging variables, data treated as panel data (t statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001).

While on the macro level the analysis would be done, still on the meso level one last step remains. The analysis of variance, ANOVA, is the last step. Tables 4.9 and 4.10 show the results of this analysis. Table 4.9 is from the high variation perspective, and to illustrate highIS has been left in (values 0 and 0), in table 4.10 the reverence point is the mediumIS. Here it has been left out since the values for the comparing level would once more be 0 and 0.

In table 4.9 we can see that R-squared is 21.22% and the number of observations is 437. The column partial SS shows the cases that can be explained by the model. F represent the difference between the different levels of cultural diversity, lowIS medIS and highIS. The degrees of freedom, df and Prob>F (Prob>F is p), are the tools that we use to state whether or not F is significant. Here we can see that the high and low level of cultural diversity significantly differ, F= 69.16 with prob>F being <0.001 having 1 degree of freedom. While the difference between the medium and high level seems to be small, 0.54 and not significant as prob>F = 0.4626, (p =0.4626).

In table 4.10 we see a similar picture, the difference between the medium and high levels of cultural diversity seems not significant, as again prob>F = 0.4626. The difference between the medium and low level is large; 109.84 and significant since prob>F is <0.001 and has 1 degree of freedom.

This tells us that as the medium and high levels are slightly different yet not statistically different, these two levels do significantly distinguish themselves from the low level of cultural diversity.

```
            Number of obs =        437     R-squared      =  0.2122
            Root MSE       =    201.284    Adj R-squared =  0.2086

  Source  | Partial SS         df          MS          F     Prob>F
 ---------+--------------------------------------------------------
   Model  |  4736879.5          2     2368439.7     58.46   0.0000

   LowIS  |  2801845.4          1     2801845.4     69.16   0.0000
   MedIS  |  21899.264          1     21899.264      0.54   0.4626
  HighIS  |          0          0
 ---------+--------------------------------------------------------
 Residual |   17583591        434     40515.186

   Total  |   22320470        436     51193.739
```

Table 4.9: ANOVA analysis high level of cultural diversity as reference

```
            Number of obs =        437     R-squared      =  0.2122
            Root MSE       =    201.284    Adj R-squared =  0.2086

  Source  | Partial SS         df          MS          F     Prob>F
 ---------+--------------------------------------------------------
   Model  |  4736879.5          2     2368439.7     58.46   0.0000

   LowIS  |  4450299.2          1     4450299.2    109.84   0.0000
  HighIS  |  21899.264          1     21899.264      0.54   0.4626
 ---------+--------------------------------------------------------
 Residual |   17583591        434     40515.186

   Total  |   22320470        436     51193.739
```

Table 4.10: ANOVA analysis medium level of cultural diversity as reference

Chapter 5: Conclusion

This chapter will deal with the results of the study. In the first part it will use the analyzed data and form a conclusion in order to answer the research questions and asses the hypotheses using the data. Next in section 5.1 recommendations will be made out of the illation of the first part. Following this, in section 5.2 the limitations of this study will be discussed, and at the end of the chapter here will be some recommendations regarding any future research that might and perhaps should come to be.

The main research question that was raised in this thesis is the following: To what extent does cultural diversity influence the quality of higher education of European research universities. The first two sub questions were conceptual, and answered through the conceptualization of the variables. And the latter sub question, SQ3 was: Is there an optimum of the degree of cultural diversity to improve the quality of higher education. I will answer the posed questions, by addressing the hypotheses.

The first hypothesis is the following: If the cultural diversity of students of a research university rises, then the quality of higher education of that research university tends to rise as well.

In order to test this hypothesis linear regressions have been made on both macro and meso level. The macro level offers no significant proof that there exists a correlation between cultural diversity and the quality of higher education within a country. Also the low correlation supports this finding, as does the low R-squared. On the other hand, the linear regression on meso level strongly suggests that there exists a correlation. The results are highly significant and supported by high correlation of -0.433. When it comes to the linear regression of the panel data, still the two more complex models support the idea that there is a significant correlation. This means that the main hypothesis is tentatively confirmed. And it seems that there is a correlation between cultural diversity and the quality of higher education. The ANOVA analysis supports this claim by showing that both medium and high levels significantly differ from the lower level.

The second hypothesis is the following: If the quality of higher education of a research university rises, then the cultural diversity of students of that research university tends to rise as well.

The data regrettably was not appropriate to determine the time order. Hence the answer to this hypothesis is the same as for the previous one, the main hypothesis is tentatively confirmed. And it seems that there is a correlation between cultural diversity and the quality of higher education. Yet the intention of the second hypothesis was not met, since it has been created to confirm or deny actual causation. This is not possible with these data.

The third hypothesis is tested to answer the third sub question: If the cultural diversity of students of a research university rises further than the optimum then the quality of higher education of that research university will tend to fall, as opposed to rising further.

As explained above, the normal linear regression on macro level showed no significance to the cultural diversity (% international students). However with the introduction of the squared cultural diversity (ISSquare) in model three and four of the linear regression, there is a certain significance as $p < 0.05$. This means that this might actually be a first hint of prove of a squared correlation. This is once more confirmed in the third model of the linear regression of panel data on macro level. The linear regression on meso level is highly significant, $p<0.001$ a trend that is confirmed by the analysis of the linear regression of panel data where the introduction of the squared variable is still significant with $p<0.05$. Both measurement levels seem to support the existence of a squared correlation. The next step was the analysis of variance. The ANOVA analysis shows a significant difference between both the medium and high levels of cultural diversity as opposed to the low level of cultural diversity when there is no significant difference between the medium and high level of cultural diversity (yet a non-significant difference still exists) which is also illustrated by varying results in the F-test, which, while comparing

medium cultural diversity to low cultural diversity F= 109.84 (p<0.001) and F=69.16 (p<0.001) when comparing the high level of cultural diversity to the low level. The ANOVA analysis thus does not strongly support the idea of a squared correlation. With the results of these tests put together it is fair to cautiously state that there might be an optimum yet the fact that the ANOVA analysis reports no significant difference between the high and medium levels of cultural diversity ensures that I cannot confirm the hypothesis clearly.

The answer to the main research question in short would be that increasing cultural diversity by adding more international students in order to increase the quality of higher education generally seems good practice for research universities. The linear regressions on the macro and especially meso level shows a conformation of the main hypothesis. Despite the significant results of the squared cultural diversity variable (ISSquared) in the linear regressions, we notice that in the ANOVA analysis there exists a difference in level only between a low level of cultural diversity on the one hand, and medium and high levels on the other hand. This does not clearly confirm a squared correlation as asked for in sub question three. This means that having a certain degree of international students, from about 20 percent on, is positive for the quality of higher education. The proof for an optimum is not significant, yet at least it is clear that it is positive to have a least percentage of about 20%. This counts certainly for the United Kingdom and might be applicable to research universities in western or first world countries. Because of the meso level analysis limitations regarding external validity, this is not generally applicable.

5.1 Recommendations

After having interpreted the results, I will shortly elaborate on what this actually means in realistic terms. As the analysis on meso level has only been done with research universities from the United Kingdom, universities from different countries need to keep in mind that results might differ in their countries.

The main recommendation is for research universities to increase their share of international students to at least 20 percent. This is the threshold where the low level of cultural diversity stops and the medium level begins.

The second recommendation entails the idea that they should tend to not reach for an explicitly high level of cultural diversity, since although the effect is not unequivocally, there seems to be some proof that the optimum percentage of international students lies between 20% and 40% international students. Reaching for higher percentages might have adverse effects.

5.2 Limitations

Throughout this thesis I have tried to provide a methodology that will ensure that the validity and reliability of this research remains high while searching for the answer to my question. Yet many obstacles have arisen, that have placed limitations on this research. In this section I will address these limitations, explain why they exist and then I will try to assess the impact of each limitation on the findings and conclusion of this thesis.

The first limitation is a lack of prior research; although there is a base of research addressing the idea of internationalization and its effects, for example: Knight (1994) and de Wit (1999). This thesis aimed to use this base in order to conduct further research into a niche. This niche is unexplored, especially in a quantitative way, as the existing literature rather takes a qualitative approach. This limitation is an expected limitation that researchers may encounter while striving towards new knowledge and exploring research gaps. The influence of this limitation on the conclusion and findings of this thesis is not expected to be weighty, yet other models might lead to different findings.

Another limitation is that the chosen universities measured at the meso level, are all from the United Kingdom. This limitation is a result of a direct choice, as it has been chosen in order to eliminate most country related external variables. This fact however may make the conclusion of this thesis less externally valid, as the conclusion on the meso level can only be drawn to fit the United Kingdom instead of the European countries.

The following limitation is the most apparent one in this thesis, there is a lack of data. This is a result of two main factors: First, different sources for data have these data available over different time periods. Making usable data from the data bases has in some cases resulted in a decline of the amount of years from which we can use data, this is explained below. Second, some data is not provided or available in a usable way.

The first factor exists because the data for the independent variable might go from 2001 to 2015, and the dependent variable from 2011 to 2017, this would result in usable data from 2011 up until 2015 that can be analyzed since only for these years there appears to be an overlap. This actually has had an impact on this study, since it initially intended to solve the 'chicken or egg problem' of cultural diversity and quality of higher education. Left with data for not more than 7 years, the time factor cannot be properly determined and no conclusion can be drawn regarding spuriousness.

The second factor appears in the variable of cultural diversity. Cultural diversity was intended to be a variable consisting of the percentage of international students at the institution or country, as well as the number of different cultures of in the international students in these institutions or countries. Unfortunately, found data only addresses the main countries from which the students arrive, and adds an extra column for "rest". It would however have been crucial for this indicator to know what the "rest" actually consists of, otherwise, the amounts of all countries would be the same, for instance the 10 most important ones, and the "rest", which then would result in a variety of 11 for every single country, and with no variety in the data there cannot be a regression analysis. This is also the reason why cultural diversity now, is merely represented by the percentage of international students at the respective institution or country. The impact of this on the study's overall findings and conclusions is hard to assess, what is apparent is that no conclusions can be drawn regarding the influence of specific cultures on found effects.

A last limitation is the use of the control variable lnGDP. As addressed in the data analysis part, there seems to be a bias within this variable due to the country size. In retrospect it might have been wise to not take the natural logarithm of the GDP, but rather a GDP per capita. This would have made the control variable more useful.

5.3 Future research

Having elaborated on the limitations surrounding this thesis, there nevertheless remains good cause to further study this area. There are several aspects that can be further studied, some aspects as a direct result of this study, like the choice of data, and others because the study has touched upon the subject and has deemed it to extensive for the purpose of answering the research question, such as the definition of cultural diversity through the quantification of disparity between cultures. Here I aim to shortly elaborate on some possible future research based on the limitations of this thesis and the concepts encountered.

The first recommendation for future research is based on the data limitation. The data that has been found over the course of this study, has been panel data over 7 years. Many changes within these years were too subtle to make a large impression within the regression. For future studies it can be recommended to take data that is either covering a lot more years, or to take data from several years, yet further apart rather 1995 2000, 2005 2010, 2015 then 2010-2015. The changes in cultural diversity are small over time and might be more significant it the time factor increases. This same study, having a longer time frame, might also be able to solve the question of causality between the two variables and deal with the issue of spuriousness.

A second recommendation is also based on data limitations. As mentioned in the limitation part, using only universities of one single country for measurement on the meso level has the advantage of elimination many country based variables, yet it also limits the external validity of this research. Future research might solve this by using possibly many more data taken from universities across several countries. This could for instance be done by using all universities within the top 1000 of the Times Higher Education rankings. While controlling for external variables, the multitude of research universities covered might make the data much more valid. As a result the findings of the research would be applicable not only mainly to universities in the United Kingdom, but rather generally applicable.

The next cause for future research is based on the definition of cultural diversity. To make proper use of the definition of diversity as consisting of variety, balance, and disparity (Stirling (2007), Ranaivoson (2013)), the disparity needs to be established. This could shed a light on the effects of different cultures on the quality of an institution. Such a thing could prove very practical for universities when recruiting international students.

A last option for future research is to add a micro level, consisting of university programs, to test the relationship. This setup could provide an even more controlled environment, where external variables such as the GDP of a country has no influence on the data.

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