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DIPLOMA THESIS

Influence of Education on GDP of Least Developed Countries

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Declaration of Integrity

Herewith I declare that this bachelor thesis called “Influence of Education on GDP of Developing Countries”, I assessed on my own with the usage of knowledge from the listed literature and with the help of my supervisor.

In Prague, 31.3.2012 Tereza Novotná

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In Prague, 31.3.2012 Tereza Novotná

Influence of Education on GDP of Least Developed Countries

Vliv vzdělání na HDP v nejméně rozvinutých zemích

Abstract

Not all of the countries around the world are equal in the terms of economic and social situation. Those countries, whose inhabitants face the worst conditions to live in, are collectively called as the developing countries. Its subgroup, the Least Developed Countries, face the worst standard of living and hence those countries are in the focus of international organizations dealing with poverty eradication and ways how to improve their conditions.

The purpose of this diploma thesis is to bring fundamental knowledge about the situation of these countries and to focus on the issue of education as a route to alleviate poverty and boost the economies of the countries. By statistical methods as a correlation research done through the multiple regression, it will be shown how the level of education can influence the GDP per capita in the Least Developed Countries. Other objectives are to inform about the criteria that divide our world and how this group of states is perceived by diverse international organizations, as a part of the descriptive research. Another purpose is to show that the level of education is one of the most important social factors that determine the development of the individual country, and introduce that education has its specific problems and issues in the Least Developed Countries, but even though it enables to increase the standard of living, welfare and enhance the economic growth in some of the developing countries. The thesis also deals with the quality of education and how the reputation of the school system can influence the demand for graduates on the labour market.

Despite all of the obvious benefits of education, each country is individual and the particular government should be able to determine whether the focus only on education of inhabitants will be beneficial and will help to increase the standard of living. There are also other factors like, political situation, which determine the well being of people and economic growth.

Key words: Least Developed Country, gross domestic product (GDP), gross domestic product per capita, literacy rate, education index, human development index

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List of Abbreviations

AIDS – Acquired Immune Deficiency Syndrome

CDP – Common Development Policy

GDP – Gross Domestic Product

GNI – Gross National Income

GPI – Gender Parity Index

HDI – Human Development Index

HIV – Human Immunodeficiency Virus

LDC – Least Developed Country

MDG – Millennium Development Goal

UN – United Nations

UNDESA – United Nations Department for Economic and Social Affairs

UNDP – United Nations Development Programme

UNESCO – United Nations Educational, Scientific and Cultural Organization

UNOHRLLS – United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States

USD – United States Dollar

WB – World Bank

WTO – World Trade Organization

1. Introduction

There are different opinions on how many sovereign countries are actually in the world. Different resource will provide different numbers, but the most recent and most commonly cited number is 196 countries in the world. (Rosenberg)All of these countries can be divided among many different groups according to dozens of various characteristics although the main division is according to the level of development in the country. So, there are developed countries, which are considered as the wealthiest and strongest segments of the global community. Although they are least in number, they contribute the highest portion of the world´s GDP. Usually they have the highest incomes, GDP per capita and other important indicators, which are observed and recognized worldwide. We have countries in transition, whose main economic and social indicators exhibit significant growth, but they still are not on the level of the developed world. Under this group we can find post – soviet republics in western and central Asia. These countries are not considered as developed neither developing, but some resources do not even recognize countries in transition as a separate group. The third group of sovereign states belongs to the so called developing world or less developed countries. These countries usually have lower standard of living, their industrialization struggles relative to the population and other indicators as income per capita or GDP per capita are at intermediate or low level. The group of developing countries has a subset called the Least Developed Countries. They lie on the very opposite of the Developed Countries, they are the most poorest countries, their social and economic development is very slow or none, there are high inequalities in income distribution and their whole economies are scarce of financial resources as well as human capital, which is usually determined by political conflicts, civil wars and famines, which occur due to a very low agricultural productivity and almost no investments in the agricultural sector. These Least Developed Countries are trapped in their own vicious circle of poverty, forced to export only labour intensive products due to the very low level of the industry sector, but the living standard of the workers is very low and they are not able to protect themselves from personal bankrupts or low nutrition, but due to the political

instability or inability to implement any policies, not even the government is able to protect its own inhabitants. (The United Nation; UNOHRLLS, 2011a)

The whole world agonizes over the reasons why some countries are more developed than others and why some are historically underdeveloped and after decades they still are not able to boost their economies and social welfare. Since the 1960´s there has been so many development projects from non-governmental and governmental organization in various aspects of the human living including agricultural and animal production to ensure sustainable production and distribution of food and increase the quality of nutrition. Other projects were focused on the health care systems, building hospitals, training staff and providing neccessary drugs and material; other programmes targeted gender, income inequality and other issues, which were perceived as possible resolvement of the poverty of the third world countries. But one of the most important focuses is on the educational sphere. No futher development is possible without knowledge, education, skills and experinces. Education is one of the main criteria to identify whether the particular country is developed, developing or the least developed. The level of education indicates how people are able to think about themselves and about their own situation and deal and finally successfuly resolve their problems. Education brings responsibility for own decisions and actions but also certain freedom, because the more opportunities and choices you know, the more you are free to choose the one that is desired. Education, seen as summary of experiences, knowledge and skills, is also an opportunity to open minds and change the attitudes of people.

2. Objectives and Methodology

2.1 Objectives

Among the objectives of this Diploma Thesis is to provide fundamental background of the socioeconomic situation of the Least Developed Countries and why some world´s countries do belong to this group. Also according to which indicators are the countries differentiated and that these indicators were usually established by major global organisations which decided to following up the trends of the countries. The indicators are worldwide recognized and commonly used by scientists and the general public. While the objectives are predetermined, it is a structured approach.

The objective is to determine the importance of education in terms of development by comparing different Least Developed Countries according to various indices. By statistical methods a hypothesis of this Diploma Thesis should be approved or rejected. And the **hypothesis** is as follows:

The level of education in the Least Developed Country has a significant positive impact on the country´s gross domestic product per capita.

- which indicators have significant impact: *to determine which indicators, if not all of them, have a significant positive impact on the GDP per capita of the country*
- ability to generalize the results to all LDC: *is it possible to generalize the results of the research to all Least Developed Countries?*
- to determine the complexity of the topic: *are there any other indicators influencing the GDP per capita?*

Side objectives:

- to provide fundamental background about the LDC
- to determine stages of education and their importance
- to show specific aspects of education in LDC

2.2 Methodology

To prove or disprove the hypothesis that the level of education has significant positive impact on the gross domestic product of the country, I used several different techniques.

2.2.1 Data Collection

Firstly, the literature review part of this Diploma Thesis is based on a analysis of secondary data like scientific publications, documents and web sites which are publicly accessible to enable a cost free analysis and hence effective descriptive research. All of the resources used were analysed patiently and their credibility is based on their scientific foundation or authorship of globally well known organisations like the United Nations and its affiliates and World Bank publications.

Secondly, I have collected secondary data from publicly accessible database of the World Bank, which is generally known and used and its credibility is also given by the author organization. The data were collected from the year 1999 to 2008, to achieve a reasonable length of the future time series. These data were afterwards ordered and organized according to the list of the Least Developed Countries and according the socioeconomic indicators which were suitable necessary for further quantitative statistical analysis.

2.2.2 Time Series

The time series of 10 observations is a reasonable length which can provide a view into the trend of the development of the chosen socioeconomic indicators of the countries. Unfortunately, the data were not available for all of the years of the time series, so it was needed to use the method of a trend function, according to which we are able to count the missing observations of the time series. Four countries of interest were selected, because of the most data available. Two are from Africa (Benin and Lesotho) and the other two are from Asia (Cambodia and Nepal) Once all of the four time series were completed, they were quantitatively analysed in the statistical programme Gretl, to show us all necessary statistical indicators and result

which are need for complete statistical analysis in a much short time than other ways, as for example the MS Excel, which is also very useful, but time consuming. The descriptive analysis shows the ranges in which are the given indicators in and it also shows the minimum and maximum values of the chosen indicators.

2.2.3 Multiple Regression

The statistical programme Gretl processes the obtained data by a method called multiple regression on the basis of the method of the Ordinary Least Squares, which is based on a minimal amount of residual sum of squares. (H.R. Seddighi, 2000) This method enables to detect and examine the relationships between many independent variables which are influencing the dependent variable at one time and it shows how much is the relationship influential. (Columbia CNMTL) Except the multiple regression, more additional statistical tests were used in this quantitative analysis, which are necessary to prove the significance of the individual explanatory variables, the relationships among the studied explanatory variables and the strength of the relationships between the significant independent variables and the endogenous variable. The multiple regression enables to conduct a correlation research to determine the relationships among the variables.

All of the chosen socioeconomic indicators are perceived to have a significant and positive impact on the country´s GDP per capita, as it is described in the hypothesis. The multiple regression will help to prove or disprove the hypothesis.

2.2.4 Limitations of the Methodology

As each research has some limitations, this one is not exceptional. It has several limitations which occurred before and during the statistical analysis. The biggest limitation is the data set itself. The accessibility of the socioeconomic indicators of the Least Developed Countries is very low, due to the fact, that those countries usually do not have the means to collect those data properly at non of the levels, nor the regional ones as well as at the national levels. Another reason may be the political and social situation in the country, in the time of a conflict no one will sacrifice time to collect some data which do not even seem important, so the people

who suffer from malnutrition or they simply do not have education to be able to read and write to be able to conduct any kind of a database. Despite that the majority of these countries are members of international organizations, which require administration of some databases and provide them to the organizations, so they can be publicly accessible, some of the countries do not meet these requirements. And if they do, sometimes it is hard to consider those data reliable enough, because as we know the situation in the countries usually do not enable proper data collection.

Another limitation was the calculation of the missing data in the time series. The trend function method is the most commonly used to calculate the missing values and forecasting, but sometimes it does not copy the reality and it is hard to choose the right type of the trend function to trace the real trend of the time series. These miscalculations can afterwards deviate the statistical results in the terms of correlation or the value of the regression coefficient or coefficient of determination.

2.2.5 Comparison

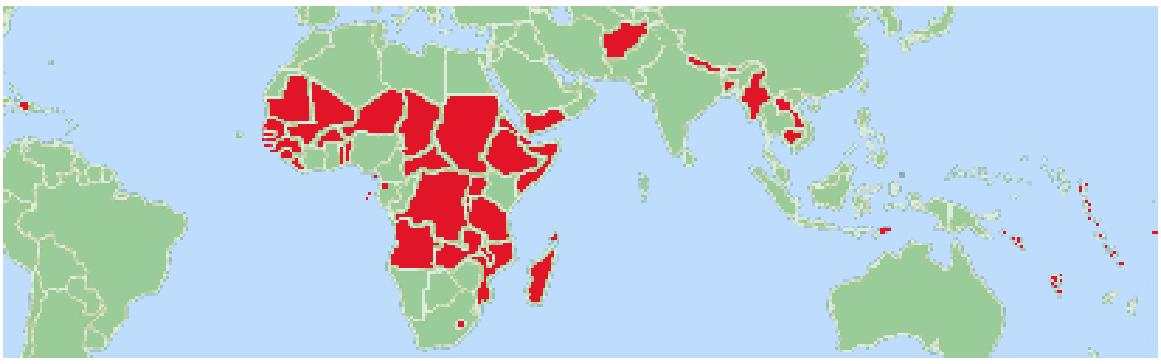
There are many authors dealing with the situation of education in developing countries as well as in the LDC, but they mainly focus on qualitative approaches, not using any statistical approach, trying to identify, which of the indicators are significant for the country´s GDP per capita. Those authors like A.H. Horowitz (A.H.Horowitz, et al., 2004) Gautam Ramraj (Gautam, et al., 2007) Loyd (Loyd, et al., 1996) or Paul Glewwe (Glewwe, et al., 2005) are usually using the same resources of secondary data as are used in this thesis. Those resources are the databases of the United Nations, UNESCO or the World Bank, because these data, especially in developing countries, exist only in these databases, because those are the organizations which deal with such issues and are monitoring the collection of the data.

3. Literature Overview

3.1 The Least Developed Countries

There are 49 of Least Developed Countries around the world. 34 of them can be found in the African continent, 14 in Asia and the Pacific and 1 in Latin America. The list of The Least Developed Countries consists of Landlocked Developing Countries as well as Small Island Developing States. All of the 48 Least Developed Countries are: Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea – Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Sudan (since 9th July 2011 split into Republic of South Sudan and Sudan), Togo, Uganda, United Republic of Tanzania and Zambia for African continent. For Asia and the Pacific are Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, Lao People´s Democratic Republic, Myanmar, Nepal, Samoa, Solomon Islands, Timor – Leste, Tuvalu, Vanuatu and Yemen. And finally, for the Latin America and the Caribbean it is Haiti. All of those countries together are occupied by more than 880 million people which is almost 12% of the world´s population, but all these together produce only less than 2% of the world´s gross domestic product and negligible share of traded goods and services. (The United Nation; UNOHRLLS, 2011a)

Figure 1.1: World Map of LDC



Source: UN DESA; Development Policy and Analysis Division; 2005

All of these countries have some similar characteristics and due to those they are included among The Least Developed Countries. All of them are low – income countries where there are severe structural obstacles to a sustainable development. These obstacles consist in low gross net income per capita in three consecutive years – the lower level of GNI per capita for inclusion is less than 905 USD, level of GNI per capita for exclusion is above 1,086 USD (The United Nations; OHRLLS, b), high percentage of population undernourished, high under five mortality rate, low gross secondary enrolment ration, high adult illiteracy – those are indicators which are comprised in the Human Assets Index, population size which must not exceed 75 million inhabitants (The United Nations; OHRLLS, b), remoteness, merchandise export concentration, very high share of agriculture in the gross domestic product of the country, high percentage of victims of natural disasters, instability and low agricultural production and instability in exports of goods and services which are used to compute the Economic Vulnerability Index. (The United Nations DESA, a)

If all of the criteria listed above are fulfilled, the country is listed among The Least Developed Countries. "To become eligible for graduation, a country must reach threshold levels for graduation for at least two of the aforementioned three criteria, or its GNI per capita must exceed at least twice the threshold level, and the likelihood that the level of GNI per capita is sustainable must be deemed high. To be recommended for graduation, a country must be found eligible at two successive triennial reviews by the CDP." (The United Nations; OHRLLS, b)

"The only three countries to have graduated out of the LDC category so far are Botswana, Cape Verde and Maldives. The next triennial review will be undertaken by the CDP in 2012." (The United Nations; OHRLLS, b) There are also some countries like Ghana, Zimbabwe and New Guinea, which do fulfil the conditions to get the status of LDC, but they do not want it. They argue that the indicators monitored by the UN are not well explaining the real performance of their economies. The list of LDC is review every three years. (The United Nations

Department of Economic and Social Affairs; Committee for Development and Policy, 2008;)

Figure 1.2: Asymmetries between the Inclusion and Graduation Processes

	INCLUSION	GRADUATION
CRITERIA		
Number of criteria to be met	THREE	TWO
Threshold of criteria	Established at each review	Higher than inclusion
Eligibility	Determined once	Determined twice
Timing	Effective immediately	Preparatory period (three years)
Approval by country	Required	Not required

Source: The United Nations Department of Economic and Social Affairs; Committee for Development Policy; Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures;2008

3.2 Perception of the LDC´s by the WTO

The World Trade Organization was established in 1995 on the bases of the post war GATT – General Agreement on Trade and Tariffs. The job of current WTO is to establish, implement and control worldwide rules in terms of trade of goods and service. Other functions are to ensure free and predictable market, settling disputes among its members and provide space and time for negotiations. Nowadays the WTO has 153 members which include the majority of all countries. (The World Trade Oranization, 2011)

Obviously, two thirds of the members rank among the developing countries which are playing still more and more important role, due to their number and also increase in the volumes of goods and services traded among them. The WTO implements several different approaches how to deal with such countries to increase their efforts in trading and thus enable their economic and social development. The

WTO establishes such agreements so the developing and the Least Developed Countries are having special provisions, the WTO´s Committee on Trade and Development is deal with the specific topics of the developing country members in terms of debts and transfer of technology and WTO Secretariat is dealing with the transfer of knowledge in terms of different kinds of training. There is no doubt that the developing countries which are members of the WTO get special treatment, different from the developed members. They have more time to fulfil their commitments, they get special provisions to boost their trade opportunities and they are provided with safeguards to ensure the financial laws are obeyed.

The Least Developed Countries get even more attention from the side of WTO. They are the only ones who do not have to pay for an advice. The WTO tries to ensure that the LDC are the ones who will benefit the most and other countries should decrease import barriers for them, so the products from the LDC´s can be sold anywhere else. More technical assistance and support is available. The representatives of the LDC´s are also provided with permanent offices in Geneva, the seat of the WTO, so they are able to negotiate anytime it is needed. The WTO and its Sub – committee on Least Developed Countries are trying to develop working and efficient computer networks in the LDCs. (The World Trade Organization, 2010 pp. 93-98)

3.3 The United Nation´s Perception

The organization of United Nations is the one who developed and implements the rules under which countries are defined as Least Developed or graduated as no more Least Developed. This category of LDC was established by the UN in 1964 on the United Nations Conference on Trade and Development in Geneva. All the member countries decided that there are countries which deserve even more attention that the developing ones, because the measures that were supposed to be helpful to the developing countries were not always as profitable for the less developed. By the next Conference in 1968 in New Delhi, there already existed a concept of methodology how to identify such LDC and also different approaches how to deal

with their problems and on what specific issues should the UN and its members focus on dealing with the LDC.

The biggest problem that the UN have with the identification, classification and monitoring of the LDC´s is the impossibility get reliable, contemporary and internationally acceptable and comparable data. These data are comprised from several statistical indicators which are relevant for the classification of a LDC. Occasional refinements are recommended to ensure updated information and availability of data.

To get status of LDC is much easier than to graduate. Inclusion consist basically with statistical data collection, country assessment note presented to the Committee, recommendation report send to the Council and then if the country agrees, it is officially listed among the LDC. To graduate is more complicated and it takes longer time. The Committee notifies the Council about all of the LDC which meets the conditions for graduation. Then vulnerability of the country is considered, dealing with the socioeconomic overall situation, statistical data are analysed and compared to others. Afterwards there is ex ante impact assessment dealing with all possible risks and gains connected with the graduation, the whole process takes three years and during that time the country and cooperatives from the UN are developing the transition strategy to ensure that the graduation will be smooth.

3.4 Brussels Programme of Action

The Programme of Action for the Least Developed Countries was adopted by the United Nations organization at the 2001 in Brussels. The goals of this programme are to eradicate poverty and inequalities, improve human welfare, create sustainable economic environment. There are 30 international goals grounded in the Annex I. in the Programme, some of them are similar as the Millennium Development Goals concerning the eradication of poverty. There is a short list of some of the goals and targets which are concerning the topic of this thesis, economy and education:

Attain a GDP growth rate of at least 7% per annum; Increase the ration of investment to GDP to 25% per annum; Making available the widest achievable range of safe, effective, affordable and acceptable family planning and contraceptive methods; Children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete, free and compulsory primary education of good quality; Achieving a 50% improvement in levels of adult literacy by 2015, especially to women, and equitable access to basic and continuing education to all adults; Eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girl´s full and equal access to and achievement in basic education of a good quality. (UNOHRLLS, 2000c)

Most of the goals and their fulfilment are bounded by the year 2015 as well as the Millennium Development Goals and their performance is monitored on the basis of predetermined socioeconomic indicators, usually introduces by UN organization or the World Bank.

There are also parts of the Programme which are tasking the LDC themselves to achieve certain targets. The LDC should undertake such actions to assign high priority to education and the equal access to everybody, to reform the educational systems if it is necessary to ensure that everyone has an equal opportunity to gain experiences and skills which can be afterwards used in fostering the economic opportunities. Also to train the teaching staff in such manners, that they are gender sensitive to ensure higher girl´s enrolment ratio, development of technology and its use in the teaching and learning. The LDC should attract its nationals who are living abroad to return to their country and try to develop sustainable educational system, which also takes advantages in the overall awareness about the HIV and other civilization diseases, promoting the culture of peace and strengthen the importance of consensus when resolving disputes.

To all of these points listed above which are assigned to the LDC there exist similar points assigned to the development partners to help the LDC to achieve all

these goals, either by financial or capital help. Except education, the Programme also includes other issues which should increase the probability of achieving the predetermined goals, like fostering a people – centred policy framework including the improvement of welfare, ensuring a good governance at all levels of the system, building human and institutional capacities, including education and training, health and nutrition issues, population as a whole, social integration and building productive capacities to make globalization work for LDC like physical infrastructure, technology, development of enterprises, energy, mining, tourism and sustainable agriculture. The Programme tried to cover as much issues as possible to ensure the LDC are taken into serious account by the others and that they are important part of the international community which have more important position in terms of international trade.

There are some principles how the Brussels Programme of Action for the Least Developed Countries are implemented. The first approach is the integrated approach. The economic development of the LDC should be observed in ling period of time by the organizations that are part of the UN and also by other external organizations to achieve comprehensive data. Nevertheless the economic development should be connected with other social indicators, so the economic development is not on the expense of other social issues. Genuine partnership underlines the importance of the legal framework and national policies implemented by the governments of the LDC. Country ownership means that the whole country has the same objectives so the achievement of the goals is easy and smooth. Market consideration is necessary for the understanding of what forces are shifting the market economy and sustainable economic development and poverty reduction. The consideration should show the weaknesses of the economy and government and find balance portions of public and private investments. Result orientation highlights the positive effects of the whole process of implementation, monitoring and controlling of the processes and progresses. All of these steps should ensure that the LDC is able to sustain economic growth, eradication of poverty and improvement of social and human welfare and finally for graduation from the list of LDC. (UNOHRLLS, 2001)

3.4.1 UN – OHRLLS

The United Nation Office of the High Representative in regard to LDC, Landlocked Developing Countries and Small Island Developing States was established by the UN organization to ensure the implementation, monitoring and review the implementation of the Brussels Programme of Action for the LDC. The key activities are to assist the General Assembly with the coordination of the project in LDC on national and regional levels, to produce annual reports of the progresses, to ensure advocacy in favour of the LDC in terms of all issues necessary and finally to assist and mobilize the international support for successful implementation of the Programme as well as consult all necessary issues with the individual Least Developed Countries. (UN OHRLLS)

3.5 Adult and youth literacy

The literacy is a human´s ability to read, write and think about the written words. In the developed world it seems normal that everyone can do that, but in the developing world it is not so obvious. There can be found a link between the literacy rate and the development. Literacy is a very basic right that enables achievement of all other rights and a fundamental cornerstone of education, through that it is also a tool for eradication of poverty and ability how to find consensus in the society and develop successful and sustainable cooperation. The reality that the literacy is important is only highlighted by the fact that it is encompassed among the Millennium Development Goals and all of the organizations dealing with development are focusing on the indicators which are showing the level of literacy.

Talking about literacy, there is a huge difference, if we are talking about adult and youth, or men and women. Almost one billion of people around the world are illiterate and two thirds of them are women. The disparities between the male and female literacy rate is measured by the Gender Parity Index (GPI) – the ratio of female to male literacy rates.

Figure 1.3: Adult and Youth Literacy Rates by Regions

Adult and Youth Literacy Rate by Regions								
	Adult Literacy Rate (%)				Youth Literacy Rate (%)			
	Total	**Male**	**Female**	**GPI**	**Total**	**Male**	**Female**	**GPI**
Developed countries	99	99.2	98.9	1.	99.6	99.5	99.6	1.
Sub - Saharan Africa	62.5	71.6	53.6	0.75	71.9	76.8	67.1	0.87
Latin America and Caribbean	91	91.9	90.3	0.98	96.9	96.7	97.2	1.01
Southern Asia	61.9	73.2	50.9	0.74	79.3	85.7	73.3	0.86
Oceania	66.4	70.2	62.6	0.89	73	72	74.1	1.03

Source: UNESCO Institute for Statistics, Data Centre, stats.uis.unesco.org; 2008

Adult literacy rate includes people older than 15 years old, and youth literacy rate conclude people aged from 15 – 24 years of age. The world wide trend is that the literacy rate increases among both of the observed groups. Although the lowest adult and youth literacy rates are still to be found in the Sub – Saharan Region, where some of the countries has literacy rate lower than 50% of the population. (UNESCO Institute for Statistics, 2010)

3.6 Primary Education

Primary education is often seen as a way to economic growth, technological and research advantages, employment and wider range of cultural heritage.

"Combined with sound macroeconomic policies, education is fundamental for the construction of globally competitive economies and democratic societies. Education is a key to creating, applying, and spreading new ideas and technologies which in turn are critical for sustained growth; it augments cognitive and other skills, which in turn increase labour productivity. The expansion of educational opportunity is a "win-win" strategy that in most societies is far easier to implement than the redistribution of other assets such as land or capital." (Bruns, et al., 2003)

Within the last decade the number of children enrolled to the primary education had increased nearly by 9% worldwide. This occurs thanks to the huge efforts from the sides of the LDC and other organizations dealing with primary education and its system, and of course, the universal primary education is the second Millennium Development Goal by the United Nations, which assigns a very high priority to the primary education as a whole. Unfortunately, the MDG will probably not be achieved by the 2015. But anyway the best and most visible progress is in the Sub – Saharan Africa, where there was, but still is, many things to be done, but the number of 59% more children enrolled is amazing and more than half of them were girls. Of course, that enrolment is not the only indicator observed, because it would be just a half of the success, but the attention is also paid to the number of children who successfully completed their primary education and are hopefully enrolling the secondary levels of education. Other observed indicators are the GPI which range from 0.97 to 1.03 shows that boys and girls have the same opportunity to enrol the primary education, the paradox is that girls are those pupils who are more likely to complete the whole round of primary education, but usually the religion or cultural biases are against them. One opportunity, how to increase the number of girls enrolled into the primary education is to increase the number of female teachers. (Starting Now: strategies for helping girls to complete primary, 2000) Some researchers see the advantage of educating girls not only in the terms of improvement of gender quality, but also in the decrease of the population growth due to reduction of fertility. (Schultz, 2001)

However there are also countries where the barriers to enter or complete the primary education are against boys. Like Lesotho, Nicaragua or Bangladesh. What the organizations also pay attention is the age of the students. The number of under – or over – aged students, it means children who are out of the age boundaries set by the particular educational system. Those students create a huge portion of all the pupils and they tend to start late or repeat the classes over and over again. What is evident is that each country, whether it is developing or not, but it counts twice for

the developing countries, needs its own strategy, how to get all of the potential students to the primary schooling. (Chimombo, et al., 2005 p. 129)

Since the data for developing countries started to be available around 1960, it is obvious, that the number of students enrolled is increasing, but it is a time to focus not only on the quantity of education in the Least Developed Countries, but mainly on the quality. Children learn much less in the school than they should according to the curriculums. This low quality of education is usually due to the rapid increase in the quantity and hence the shortages of materials and other resources. (Glewwe, et al., 2005) Hanushek proved that the economic success of east Asia´s countries was due to education, but not due to a high quantity of education, but much more due to the quality of the education. (Hanushek, et al., 2000) Unfortunately, children in developing countries are very often repeating grades, they are absent very often and usually they leave the school at a very low age and those who stay learn much less than they should. (Lockheed, et al., 1991)

But nowadays when the goals of the enrolment to the primary education are slowly but continuously achieved, or will be achieved in the future, the bigger concerns are about the secondary education.

3.7 Secondary Education

Because more people are completing the primary education, there obviously is a higher demand for the secondary education. Those who had successfully completed the primary education have two options – to continue or not. Secondary education is often bigger challenge not only for the students but mainly for the whole educational system, the government and the policy makers, because only healthy educational system may produce people who are able to deal with different challenges and thus boost their own and afterwards the national economy. To achieve that it is necessary, to connect the primary and secondary education effectively and also ensure that those who will complete the whole round of the secondary education will succeed in the labour market. The trend shows that the more educated the person is, the more likely is to be employed. This applies even for the developing and also developed countries. Several years ago, the majority of countries had compulsory

primary education, but nowadays also lower level of secondary education is considered as a must. Lower level secondary education is mandatory in 80% of all of the world´s countries. (UNESCO Institute for Statistics, 2011)

More educated people in the country foster the economy and develop industries, which bring new working places and job opportunities and that require more sophisticated and educated people with relevant experiences and skills, which were gained during the primary and secondary education.

Unfortunately, the secondary education has to deal with more barriers and problems than the primary education. Firstly, the secondary education is more expensive per student, so there are only a few developing countries which are providing the secondary education for free. The question of money is also connected with the number of secondary schools. Their net is not equally spread across the countries, so the distance that the students have to travel to school is a problem, especially for those living in remote areas, unable to use any mean of transportation and their only chance is to walk long distances. This is a barrier which is very hard to eliminate without special effort from the government or municipalities at the regional levels. Whether building new secondary schools in very carefully chosen areas or provide transportation. Unfortunately, both of the options are very costly and providing transportation is even inefficient. And of course, the secondary education is influenced by social problems which are more or less common for all countries. Dropouts of students due to diseases, in developing and least developed countries usually HIV/AIDS and malnutrition, drugs or violence.

Nowadays when the governments are investing more and more in the secondary education, which experience a kind of a boom in the developing world, there arise question of its quality. Once there is a universal access, the government should ensure that the education provided is relevant and of a good quality.

If the quality is not good enough, it can only deepen the social problems like gender inequality. There is a self controlling mechanism, if the quality of the

secondary education is not sufficient the secondary enrolment is lower and usually it is not demanded by the employers. The higher the quality of the education the more it is demanded and appreciated by the employers and companies. But there are still some countries among the least developed, mainly in Sub – Saharan Africa, which would need a huge investments from the outside, financial aid and policies to achieve a universal, good quality and affordable secondary education.

3.7.1 The effective transition rate

The effective transition rate can be counted for any level of education. It is counted as follows: the number of new entrants to the first grade of lower secondary education for the following year is divided by enrolment in the last grade of primary education minus the number of repeaters from the last grade of primary education in the following year, and the result is multiplied by 100. The rate helps to show possible barriers which exist for the children to enrol the particular level of education or the educational system as a whole. Those barriers are usually direct and indirect costs e.g. cost of uniform, transportation cost, cost of handbooks or cost the family has to pay for an external worker, when the child is out of home, etc., lack of necessary supplies or lack of teachers. If the effective transition rate is too low, it shows that there are many students that repeat the last grade of the primary education or there are not enough available places in the first grade of the lower level of the secondary education. (UNESCO Institute for Statistics, 2011)

3.7.2 Lower secondary education

The lower level of secondary education, according to the International Standard Classification of Education, should serve as a completion of the primary education, and on the other hand, it should build a kind of a foundation for the lifelong education and a basis for an individual development. In most of the countries, the lower secondary education is a part of the compulsory education.

3.7.3 Upper secondary education

Upper secondary education is a conclusion of the lower secondary education, and serves as a basis for the possible tertiary education. This level of education is not included among the mandatory levels of education.

3.8 Social and Economic Indicators

Indicators which are described in this thesis are indicators which deal with social and economic issues of the human life. At most, they have been developed by international organization which are dealing with development, international cooperation and usually they are also keeping statistic record about individual countries, to ensure that the data are comparable between each other and that the indicators which are observed are internationally recognized and understood in the same way.

3.8.1Gross domestic product (GDP)

The indicator of gross domestic product was developed by Simon Kuznets for a US Congress in 1934 and it refers to a value of all final good and services produced in a particular country in a given period of time, usually one year. There are three different methods of measuring the GDP. The most common used is the expenditure method, which sums the private consumption, government spending, gross investment and net exports. Unfortunately, the GDP indicator is usually incorrectly seen as an indicator of standard of living, but already Kuznets said that it can not be used as a measurement of welfare. As it was proven by time, the growth of GDP does not automatically ensure the improvement in the standard of living, sustainable development and reduction in inequalities. Hence policymakers should consider also different indicators to observe the overall improvement of the country. Among the main criticisms of the indicator of GDP is the inability to include and measure environmental sustainability, social factors and political measures, which are actually influencing the standard of living. The negative impact of the depletion of natural resources is counted in GDP as a very positive fact in terms of production, but the depletion definitely does not lead to a sustainable social, environmental and

economic development, nor to healthy lives, because the standard of living of people exploiting the natural resources are one of the worst conditions ever. Another criticism deals with the inequalities among the inhabitants, and even double digit GDP growth can not ensure equality, and inequality in income distribution means increase in crime levels, reduction in productivity and investment. GDP does not consider access to adequate food and nutrition, adequate access to education and healthcare system, and it does not consider small scale production which belongs to an informal economy, thus it oversees a huge percentage of the production of the people living especially in developing countries, because their small scale agriculture or other production is simple not counted in the national GDP. In terms of the GDP indicator, we must focus on the quality of the GDP growth, but not at the quantity. (Bond for International Development, 2011)

According to the CIA Fact book, the country with the highest GDP of purchasing power parity is the USA with 15,040,000,000,000 USD and the lowest has Sao Tome and Principe with 306,000,000 USD. The Czech Republic is at the 46th position with 272,200,000,000 USD. All of the figures are for the year 2011. At the highest rank among the least developed countries is Bangladesh, which is at the 44th position with 282,500,000,000 USD. The GDP adjusted for the purchasing power parity is more useful for the comparison of different countries, because it counts with relative costs of living and inflation rates in the different countries. (CIA Factbook, 2012)

3.8.2 Human Development Index (HDI)

Human development index was developed on the basis of the calls from the scientific public to have an indicator which is able to determine not only the economic growth of the country, but also includes the level of education and health issues. The human development index is composed specifically from the following data: Life expectancy at birth, mean years of schooling for adults aged 25, expected years of schooling for children and gross national income per capita. Those are three dimensions: health, education and standard of living. The human development index

was firstly presented by the United Nations Development Programme in 1990 in the first Human Development Report which is since then issued every year and it comprises the statistical data and many indicators for all of the member countries of the UN. The HDI ranges from 0 to 1 and there are 4 levels of the human development index: Very high human development, high human development, medium human development and low human development. For each year, the limits of the four different categories are changing and usually it is an increasing trend. The level of HDI determines the country developed, developing or under developed, impact of different policies and it brings a view to the level of quality of life. The HDI can also be measures at lower levels than national, for regions, cities or villages. (UNDP, 2011)

Figure 1.4: Human Development Index Trends through Decades (1980 – 2011)

Human development index trends through decades (1980 - 2011)					
	1980	**1990**	**2000**	**2010**	**2011**
Very high human development	0.766	0.810	0.858	0.888	0.889
High human development	0.614	0.648	0.687	0.739	0.741
Medium human development	0.420	0.480	0.548	0.625	0.630
Low human development	0.316	0.347	0.383	0.453	0.456

Source: Own table; Data: UNDP Human Development Report; Human development index value; 2011

3.9 Education Disadvantages

Undeniably, education brings many advantages to those who are affected. It fosters self esteem and the ability to protect own existence and ideas against other with rational arguments. On the national level, education can bring boom in the economy due to low unemployment, research and technical improvement. On the other hand, education can also bring some disadvantages, which are mainly seen just in the case of developing and least developed countries.

The first disadvantage is the opportunity cost of visiting the school. The parents and the household face the trade off between labour, that the child could accomplish at home or at the farm and expected future income of the child. The child sent to school could be working on farm, increasing the amount of nutrients consumed by the whole family, or could work in a paid job, increasing the household income. These opportunities are missed once the child is enrolled to school and even then there are some occasions when there is a need to rather stay home and help than to go to school, as the harvest time. In a society where malnutrition and terrible income inequality occurs, this is a huge personal and family sacrifice that can, in the worst imagination, cost life of other members of the family. Regardless the fact when the child is dismissed from the school or is forced to repeat the year. The opportunity cost is then even more visible. The time when the child is at school is usually markedly prolonged by the time the child needs to travel, because the school net is usually very sparse. (Chimombo, et al., 2005 p. 131) Thanks to the malnutrition, in the LDC, is a high percentage of diseases and hence orphans. It is proven that orphans tend to enrol to school less likely than children who live with their parents. It is due to the orphans living with distant relatives or foreign people who are not so altruistic in terms of the behaviour to the child and its education. (Case, et al., 2004) Miguel´s and Kremer´s research proved that children of school age are often affected by different kinds of worms, and when they are provided with treatment, their attendance increase, as well as those children, who were not treated, but they were affected due to decrease of the disease dissemination. (Miguel, et al., 2004)

Other problem is when the parents are not educated or they simply do not see the advantages the education can bring to their children. The advantages of education are not visible and clear enough to persuade the parents to send their children to school. This problem occurs even when the education is accessible and affordable. (Loyd, et al., 1996 pp. 265-298)

Another problem occurring in the families, is that there is usually more than only one child, and their distribution among the adult labour market and the

household activities is unequal, even though that they all receive the same attention from the side of parents in terms of attention or consumption. Some children are assigned to school, but the others may be working in the household or on the fam. This may be due to the fact that two educated children, who were enrolled for four years may obtain lower income on the labour market than one child with eight years education and maybe some diploma. (A.H.Horowitz, et al., 2004)

Parents who take care about the education of their children usually have to deal with very wrong access to a school of a desired quality or even to any school. Those parents should undergo such opportunity cost and move closer to the school, even when it means to pay higher rents. Those parents then usually take part in the local governments to make sure that the quality of the education in the local school is high enough to meet their desires. This parental approach may contradict with Hanushek´s theory (1995) that the more inputs the better the outcome, because these parents will take care if their children are proceeding well in the school. (Case, et al., 1999) The theory of better inputs and more outcomes – mainly better results of test – may contradict with the right to education, when inputs are invested thanks to fees from the students. Free and universal education is heavily promoted (CHER The Coalition for Health and Education Rights, 2002) and there are studies that proved that the number of students increased since the education was for free, for example in Uganda the primary school enrolment doubled. (UNICEF, 1999) On the other hand, sometimes even private schools can improve the enrolment, especially when it is subsidized. In Pakistan, there were subsidies available for girls, and it proved efficient, but only in urban areas, not in rural. Probably due to the necessity to work on farms. (Kim, et al., 2012)

Some times the teachers are the problem itself. They are teaching because they are paid for that, but they are not able to provide any practical knowledge to the students. Fuller and Clark, proved in 1994, that usually non teacher inputs are statistically more significant for the students then teacher´s inputs. (Fuller, et al., 1994) Other research proved that the teachers, particularly in Kenya, do not have

incentives in long run teaching, because when they were score due to student´s test cores, they were taking extra out-of-school classes, but once the research ended, they have stopped. (Incentives to Learn, 2004) Unlike Hanushek, other researches found out that inputs which are not valued by the teachers have much bigger impact on the outcomes, than those which are valued by teachers – like rent for teacher. (What Education Production Function Really Show: A Positive Theory of Education Expenditures, 1997)

4. Research

4.1 Chosen Variables

According to the availability of the data about the desired social and economic indicators four Least Developed Countries were chosen to serve in the quantitative statistical analysis. Those countries are two African countries: Benin and Lesotho and two Asian countries: Nepal and Cambodia as was the first intention. On the basis of the collected data a time series of ten observations was conducted for each of the country. Unfortunately, not all of the time series were complete, which was solved during the analysis by trend function computations.

4.2 Indicators and Research

Firstly there was chosen 20 socioeconomic indicators which seemed to be important for the research.

These were: *Total population, GDP per capita, total GDP, GNI per capita, human development index, adult literacy rate total, male adult literacy rate, female adult literacy rate, gross enrolment ratio for primary education for males and females, gross enrolment ratio for secondary education for males and females, gross enrolment ratio for tertiary education, education index, expenditure on primary education as a percentage of GDP per capita, expenditures on secondary education as a percentage of GDP per capita, expenditures on tertiary education as a percentage of GDP per capita, school life expectancy, primary completion rate and public spending on education as a percentage of GDP.*

All of these indicators seemed that they can be useful in the statistical model, but it was obvious that it is not possible to use all of them. The number of indicators was afterwards decreased on 9 independent variables *(school life expectancy, gross enrolment to primary education, gross enrolment to secondary education, gross enrolment to tertiary education, primary completion rate, expenditure on primary*

education, expenditures on secondary education, expenditures on tertiary education and total public spending on education and one dependent variable: *GDP per capita (current USD).*

Unfortunately, during the statistical analysis occurred a strong correlation between some of the explanatory variables which violates the fundamental econometric and statistical assumptions about the econometric model and the estimated parameters can not be efficient (see Figure 1.11). This could have been caused by errors in the data set or wrong dynamisation of the econometric model. The correlation of the independent variables was proven in the statistical programme Gretl in the correlation matrix. The econometric model was as follows:

x1 ..... School Life Expectancy, Primary to Tertiary Education in years

x2 ..... Gross School Enrolment, Primary Education in percents

x3 ..... Gross School Enrolment, Secondary Education in percents

x4 ..... Gross School Enrolment, Tertiary Education in percents

x5 ..... Primary Completion Rate, Total in percents of relevant age group

x6 ..... Expenditures per Student, Primary Education in percents of GDP per capita

x7 ..... Expenditures per Student, Secondary Education in percents of GDP per capita

x8 ..... Expenditures per Student, Tertiary Education in percents of GDP per capita

x9 ..... Total Public Spending on Education in percents of GDP

y ..... *GDP per capita (current USD) – dependent variable*

The study is based on these figures:

Figure 1.5: Time Series: Benin

Benin										
	x1	x2	x3	x4	x5	x6	x7	x8	x9	y
1999	6,9	83	22	3	39	13,2	28,2102	247,55	3	377
2000	7,1	86	23	4	39,5	12,1	24,6	212,7	3,3	346
2001	7,8	95	25	5	40	13,2	24,6	164	3,7	356
2002	8,3	101	27	6	46	10,7	19,3	144,3	3,2	405
2003	8,7	104	28	6	50	10,7	21,6	131,8	3,4	497
2004	9,1	108	30	6	54	11,6	24,8	140,8	3,9	547
2005	9,4	105	37	6	56,382	11,2	24,1	160,8	4,1	562
2006	9,958	106	38,1518	6	59,667	12,1	28,2872	149,8	3,8	602
2007	10,4	112	42,7994	5	67	12,2	32,655	190,8	3,5	684
2008	10,84	118	48,047	5	63	12,4	38,112	229,78	4,1	800

Source: Own Table; Data: World Bank Database

Figure 1.6: Time Series: Cambodia

Cambodia										
	x1	x2	x3	x4	x5	x6	x7	x8	x9	y
1999	7,6167	101	16	1	41	6,5667	11,5	43,6	1	288
2000	7,5	106	17	3	46,5	5,9	8,9	43,6	1,7	294
2001	8	113	19	2	52	6,9	6,3	43,6	1,7	315
2002	9,1	125	23	3	59	5,4	5,68	43,6	1,7	334
2003	9,5	128	27	3	65	5,5667	5,05	43,6	1,7	358
2004	9,8	130	31	3	76	5,3167	4,59	43,6	1,7	405
2005	10,1	130	35	3	86	5,0667	4,23	43,6	1,7	471
2006	10,3	130	39	5	90	4,8167	3,94	43,6	2	538
2007	10,4	129	42	6	91	4,5667	3,7	43,6	1,6	632
2008	10,5	126	44	8	86	4,3167	3,5	43,6	1,6	749

Source: Own Table; Data: World Bank Database

Figure 1.7: Time Series: Lesotho

Lesotho										
	x1	x2	x3	x4	x5	x6	x7	x8	x9	y
1999	9	100	30	2	61	35,6	79,1	776,71	14,5	405
2000	9,7	111	30	2	60	29,1	82,2	902,9	11,8	380
2001	9,8	112	32	2	61	27,3	67,4	877,3	11,1	345
2002	9,8	112	33	2	62	31,4	69,9454	1013	12,1	318
2003	10	114	33	3	64	31,5	66,794	1091,7	16,1	467
2004	10	113	35	3	65	31,1	63,6426	1170,5	13,6	603
2005	10	111	37	3	60	30,2	60,8	1249,3	15,1	656
2006	10	111	36	4	76	27,3	54,4	1337,5	14,4	678
2007	9,6	105	39	4,4848	71	25,6	54,1	1406,8	13,4	751
2008	12,558	104	41	5,1759	68	24	53,8	1485,5	13,1	752

Source: Own Table; Data: World Bank Database

Figure 1.8: Time Series: Nepal

	Nepal									
	x1	x2	x3	x4	x5	x6	x7	x8	x9	y
1999	8,5	114	34	4	63	9,1	13,1	175,98	2,9	211
2000	8,8	118	35	4	66	10,3	11,6	141,6	3	225
2001	8,4	111	38	4	65	13,8	13,8	104,7	3,7	240
2002	8,9	115	42	5	70	13	11,6	85,4	3,4	237
2003	9,1	113,5	43	5	71	11,4	10,6	65,6	3,1	242
2004	9,48	113,1	44	6	73	13,488	9,6	51,449	3,6664	272
2005	9,96	112,7	46	6,9007	75	14,157	10,5	43,845	3,8118	298
2006	10,54	112,3	44	8,0152	77	14,826	10,54	42,009	3,9572	326
2007	11,22	111,9	46,4	9,3083	79	15,495	10,72	45,941	3,8	362
2008	12	111,5	47,2	10,78	81	15,2	11,3	55,5	4,6	435

Source: Own Table; Data: World Bank Database

4.3 Time Series and Trend Function

As it was mentioned above, the obtained time series were not complete, and the missing values had to be computed by expressing the trend function equations and computed. The values which were missing, but had available value before and after can be computed as a mean of the two values, but the missing values which do not have available values before or after have to be computed by the trend function equation. Here is an example of the computation of the missing values, to show the process of the computation:

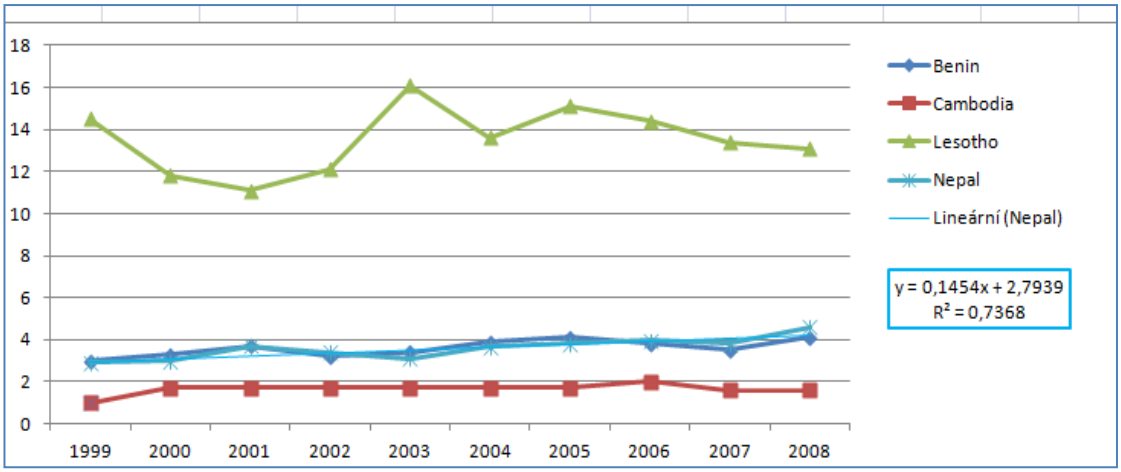
Figure 1.9: Public Spending on Education, Total (% of GDP)

	Public Spending on Education, Total (% of GDP)				
		Benin	Cambodia	Lesotho	Nepal
1	1999	3	1	14,5	2,9
2	2000	3,3	1,7	11,8	3
3	2001	3,7	1,7	11,1	3,7
4	2002	3,2	1,7	12,1	3,4
5	2003	3,4	1,7	16,1	3,1
6	2004	3,9	1,7	13,6	3,6664
7	2005	4,1	1,7	15,1	3,8118
8	2006	3,8	2	14,4	3,9572
9	2007	3,5	1,6	13,4	3,8
10	2008	4,1	1,6	13,1	4,6

Source: Own Table; Data: World Bank Database

This is a time series of 10 observations for the independent variable Public Spending on Education for all of the four selected countries. For the two missing values for countries Cambodia and Lesotho it was possible to count the means of the previous and following values to determine the missing value. But in the case of Nepal, there were more missing value and hence it was necessary to determine the trend function equation. For this determination, MS Excel was used and it showed the following graph:

Figure 1.10: Public Spending on Education Graph



Source: Own Graph; Data: World Bank Database

The trend function is represented by the thin light blue line, which is copying the trend of the Public Spending on Education of Nepal, also light blue. The MS Excel also automatically introduces the coefficient of reliability, which is ranged from 0 to 1 and the higher the value the higher the reliability of the trend function, the more it corresponds with the reality. The value of 0.74 indicates a high level of reliability. The MS Excel also provides the trend function equation which is necessary for the computation of the missing values. The x in the equation is substituted with the number which represents the year in which the value is missing and the result is the value for the particular year. The values which are marked yellow were computed by the mean computation or the trend function equation (see Figure 1.9).

Figure: 1.11: Correlation Matrix: Benin

Correlation coefficients, using the observations 1999 - 2008
5% critical value (two-tailed) = 0.6319 for n = 10

x1	x2	x3	x4	x5	
1.0000	0.9597	0.9642	0.5488	0.9737	x1
	1.0000	0.8780	0.6694	0.9065	x2
		1.0000	0.3502	0.9425	x3
			1.0000	0.4819	x4
				1.0000	x5

x6	x7	x8	x9	y	
-0.2015	0.5972	-0.1693	0.7075	0.9595	x1
-0.3405	0.4535	-0.3163	0.7074	0.8989	x2
-0.0494	0.7384	0.0703	0.6862	0.9697	x3
-0.7291	-0.3177	-0.8875	0.5378	0.3399	x4
-0.2105	0.5926	-0.1300	0.6162	0.9470	x5
1.0000	0.5432	0.6794	-0.0554	-0.0813	x6
	1.0000	0.6413	0.3761	0.7509	x7
		1.0000	-0.2277	0.0686	x8
			1.0000	0.6598	x9
				1.0000	y

Source: Own Research; Gretl 2012

This correlation matrix is based on the data about Benin and it shows all of the values which are in absolute value higher than 0.8, which indicates the correlation between the independent variables. Those values are marked yellow. The biggest problem of correlation is among the first four variables and this is the reason why they were omitted from the econometric model, because this is the only way how to get rid of the correlation and have unbiased, efficient and consistent parameters.

So the final statistical model is as follows:

x5 ..... Primary Completion Rate, Total in percents of relevant age group

x6 ..... Expenditures per Student, Primary Education in percents of GDP per capita

x7 ..... Expenditures per Student, Secondary Education in percents of GDP per capita

x8 ..... Expenditures per Student, Tertiary Education in percents of GDP per capita

x9 ..... Total Public Spending on Education in percents of GDP

y ..... *GDP per capita – dependent variable*

Based on time series of 10 observation for four different countries from the year 1999 to 2008. The times series ends in the year 2008, because this was the last year for which the data were available and forecasting the figures into the years 2011 according to the trend function could bring the danger of wrong dynamization and the forecasting to the current year was not as important for this study, because the objective is to show what social indicators dealing with education are significantly influencing the GDP of the Least Developed Countries and this is always the same. More important is to have a complete time series with at least 10 observations.

5. Statistical Results

This part is divided according to the individual countries. The first country to deal with is Benin. The results of the statistical analysis for Benin are as follows:

Benin

The correlation matrix of Benin:

Figure 1.12: Correlation Matrix: Benin - Final

Correlation coefficients, using the observations 1999 - 2008
5% critical value (two-tailed) = 0.6319 for n = 10

x5	x6	x7	x8	x9	
1.0000	-0.2105	0.5926	-0.1300	0.6162	x5
	1.0000	0.5432	0.6794	-0.0554	x6
		1.0000	0.6413	0.3761	x7
			1.0000	-0.2277	x8
				1.0000	x9

y	
0.9470	x5
-0.0813	x6
0.7509	x7
0.0686	x8
0.6598	x9
1.0000	y

Source: Own Research; Gretl 2012

Thanks to the correlation matrix, we can see that there is no correlation among the independent variables, so the eventual parameters from the statistical analysis should be efficient, unbiased and consistent. Correlation between the independent variables and the dependent variable is no problem for further statistical analysis.

Figure 1.13: Multiple Regression: Benin

Model 1: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	386.246	221.581	1.7431	0.15626	
x5	3.89737	2.17256	1.7939	0.14728	
x6	-62.7031	15.5732	-4.0263	0.01578	**
x7	23.9893	5.53713	4.3324	0.01233	**
x8	-0.659642	0.459812	-1.4346	0.22472	
x9	43.7916	25.1865	1.7387	0.15708	

Mean dependent var	517.6000	S.D. dependent var	151.2285
Sum squared resid	1595.587	S.E. of regression	19.97240
R-squared	0.992248	Adjusted R-squared	0.982558
F(5, 4)	102.3999	P-value(F)	0.000261
Log-likelihood	-39.55144	Akaike criterion	91.10289
Schwarz criterion	92.91840	Hannan-Quinn	89.11128
rho	-0.327326	Durbin-Watson	2.349388

Source: Own Research; Gretl 2012

The multiple regression showed that the variance in the dependent variable (GDP per capita) is from 99% explained by the variance in the independent variables in the statistical model. The adjusted R – squared showed that only 1% of the variance is explained by variables which are not included in the model. The Durbin – Watson test proved the result of the correlation matrix, because the value of 2.35 proves that there is no positive and no negative autocorrelation. The p – value must be lower than 0.05 to have the significance of the parameter of 95%, so the results of the multiple regression showed that there are two independent variables which are significantly influencing the GDP per capita in Benin. Those independent variables are:

x6 ..... Expenditures per Student, Primary Education in percents of GDP per capita
x7 ..... Expenditures per Student, Secondary Education in percents of GDP per capita

To find out, how significant are the significant independent variables, we need to conduct further analysis, which is proceeded by omission of the rest of the variable so we can compute the significance for the individual independent variables.

We need to define the coefficient of determination of both of the significant explanatory variables, firstly for x6:

Figure 1.14: Coefficient of Determination for x6: Benin

```
  Null hypothesis: the regression parameters are zero for the variables
    x5, x7, x8, x9
  Test statistic: F(4, 4) = 127.148, p-value 0.000181733
  Omitting variables improved 0 of 3 model selection statistics.

Model 2: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

             coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const       681.173       711.027      0.9580   0.3661
  x6          -13.6996       59.3993    -0.2306   0.8234

Mean dependent var   517.6000   S.D. dependent var   151.2285
Sum squared resid    204470.9   S.E. of regression   159.8714
R-squared            0.006605   Adjusted R-squared  -0.117569
F(1, 8)              0.053193   P-value(F)           0.823386
Log-likelihood      -63.81736   Akaike criterion     131.6347
Schwarz criterion    132.2399   Hannan-Quinn         130.9709
rho                  0.963399   Durbin-Watson        0.191696
```

Source: Own Research; Gretl 2012

The further analysis of the coefficient of determination showed, that the expenditures per student in primary education are not significantly influencing the GDP per capita. From the logic, we can see, that the parameter which was assigned to that variable came with minus. So there should be a negative relationship between the expenditures per student and the growth of GDP per capita, this is not logical. The variable could be proved as significant due to the computations of the trend functions, but in reality there is only 0.6% of variance in GDP per capita is explained by the variance in the expenditures per student in the primary education as a percentage of GDP per capita. The p – value is 0.8, which shows significance of only 20%. Although the Durbin – Watson test proves that there is positive correlation by the value near 0.19 (see Figure 1.14).

The coefficient of determination for the explanatory variable x7 – Expenditures per Student, Secondary Education:

Figure 1.15: Coefficient of Determination for x7: Benin

Model 3: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-34.0295	174.768	-0.1947	0.85047	
x7	20.7174	6.44199	3.2160	0.01231	**

Mean dependent var	517.6000	S.D. dependent var	151.2285
Sum squared resid	89771.62	S.E. of regression	105.9314
R-squared	0.563856	Adjusted R-squared	0.509338
F(1, 8)	10.34258	P-value(F)	0.012313
Log-likelihood	-59.70158	Akaike criterion	123.4032
Schwarz criterion	124.0083	Hannan-Quinn	122.7393
rho	0.654308	Durbin-Watson	0.363198

Source: Own Research; Gretl 2012

The analysis of the coefficient of determination of the x7 explanatory variable showed, that the expenditures per student in the secondary expenditure are significantly influencing the GDP per capita in Benin. It is proven thanks to the p – value, which is lower than 0.05, the value of 0.012 shows that the expenditures per student in secondary education have almost 90% significance and the coefficient of determination shows that the variance in the GDP per capita in Benin is from 56% explained by the variance in the expenditures per student in the secondary education. The rest 46% are explained by the error term, which represent all the other variables which are not included in the model. If we consider the parameter resulted from the analysis of the coefficient of determination, logically we can say that the more the government spends on student of a secondary education the more Benin will have the GDP per capita. After the statistical analysis, we can say that the statistical model for Benin would look like that:

$$yt = 20.7174x7t + ut$$

u representing the stochastic part of the model, replacing all the other influential explanatory variables not included in the model.

Lesotho

The correlation matrix for Lesotho:

Figure 1.16: Correlation Matrix: Lesotho

Correlation coefficients, using the observations 1999 - 2008
5% critical value (two-tailed) = 0.6319 for n = 10

x5	x6	x7	x8	x9	
1.0000	-0.5486	-0.7519	0.7246	0.2108	x5
	1.0000	0.6875	-0.7059	0.3482	x6
		1.0000	-0.9203	-0.2418	x7
			1.0000	0.2718	x8
				1.0000	x9

y	
0.6924	x5
-0.5812	x6
-0.8479	x7
0.9257	x8
0.3909	x9
1.0000	y

Source: Own Research; Gretl 2012

The correlation matrix for Lesotho showed that there is a correlation between the independent variables x7 and x8. The Expenditures per Student, Secondary Education and Expenditures per Student, Tertiary Education. The correlation might be occurring due to wrong dynamization of the model – the computation of the trend function, or wrong data set. For the purposes of this thesis we will oversee this correlation. The further statistical analysis resulted as it can be seen below. Unfortunately, non of the explanatory variables are significantly influencing the GDP per capita in the country, unlike in Benin. Non of the independent variable reported p – value lower than 0.05, which means that the variance in GDP per capita in Lesotho cannot be explained by the variance of the chosen explanatory variables. The Durbin – Watson test reported the value of 1.4, which demonstrates that the test is inconclusive, which can be due to the correlation previously found in the correlation matrix.

Figure 1.17: Multiple Regression: Lesotho

Model 3: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
const	-504.893	1171.73	-0.4309	0.68875
x5	1.47762	8.51736	0.1735	0.87070
x6	-2.33458	20.7938	-0.1123	0.91602
x7	0.909545	8.07292	0.1127	0.91572
x8	0.612779	0.373713	1.6397	0.17641
x9	19.277	32.8378	0.5870	0.58871

Mean dependent var	535.5000	S.D. dependent var	170.6831
Sum squared resid	31641.59	S.E. of regression	88.94041
R-squared	0.879320	Adjusted R-squared	0.728470
F(5, 4)	5.829111	P-value(F)	0.056204
Log-likelihood	-54.48760	Akaike criterion	120.9752
Schwarz criterion	122.7907	Hannan-Quinn	118.9836
rho	0.190177	Durbin-Watson	1.439692

Source: Own Research; Gretl 2012

For better imagination, here is presented a correlation matrix for the value of Lesotho, but in the model of six explanatory variables:

Figure 1.18: Correlation Matrix of six Variables: Lesotho

Correlation coefficients, using the observations 1999 - 2008
5% critical value (two-tailed) = 0.6319 for n = 10

x1	x2	x5	x6	x7	
1.0000	-0.1063	0.2727	-0.6456	-0.5356	x1
	1.0000	-0.1187	0.0033	0.0058	x2
		1.0000	-0.5486	-0.7519	x5
			1.0000	0.6875	x6
				1.0000	x7

x9	y	
-0.0551	0.5062	x1
-0.0472	-0.2609	x2
0.2108	0.6924	x5
0.3482	-0.5812	x6
-0.2418	-0.8479	x7
1.0000	0.3909	x9
	1.0000	y

Source: Own Research; Gretl 2012

There is no correlation to be found. The variables which reported some correlation were omitted and we can try to proceed the multiple regression with those six chosen variables with no correlation, to see if any of them are significant or not, because the result of the first regression could be influenced by the correlation found between the two explanatory variables of x7 and x8.

Even though that the Durbin – Watson test proved value of 2.1 which means no positive and no negative correlation, none of the explanatory variables were proven being significantly influencing the GDP per capita in Lesotho, because none of them reported the p – value to be lower than 0.05. No correlation is also proven by the correlation matrix seen above. The difference in the results of Benin and Lesotho may be given by the political situation in the countries or the composition of the GDP.

Figure 1.19: Multiple Regression of six Variables: Lesotho

Model 2: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
const	2025.69	2069.28	0.9789	0.39980
x1	-1.50257	58.9135	-0.0255	0.98125
x2	-8.80213	8.48745	-1.0371	0.37595
x5	0.204603	11.7802	0.0174	0.98723
x6	-19.5045	26.1159	-0.7468	0.50936
x7	-8.26226	8.26024	-1.0002	0.39090
x9	43.213	37.8799	1.1408	0.33678

Mean dependent var	535.5000	S.D. dependent var	170.6831
Sum squared resid	38636.08	S.E. of regression	113.4843
R-squared	0.852643	Adjusted R-squared	0.557930
F(6, 3)	2.893130	P-value(F)	0.206018
Log-likelihood	-55.48617	Akaike criterion	124.9723
Schwarz criterion	127.0904	Hannan-Quinn	122.6488
rho	-0.086045	Durbin-Watson	2.162190

Source: Own Research; Gretl 2012

Cambodia

Figure 1.20: Correlation Matrix: Cambodia

Correlation coefficients, using the observations 1999 - 2008
5% critical value (two-tailed) = 0.6319 for n = 10

x5	x6	x7	x9	y	
1.0000	-0.8843	-0.8906	0.5176	0.8518	x5
	1.0000	0.7677	-0.4145	-0.8610	x6
		1.0000	-0.7126	-0.7153	x7
			1.0000	0.2394	x9
				1.0000	y

Source: Own Research; Gretl 2012

The correlation matrix proved that there is an exact correlation with the explanatory variable x8 and this is the reason why it was omitted by the programme. There is also a correlation between the variables x5 and x6 and x7.

Figure 1.21: Multiple Regression: Cambodia

```
Model 1: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y
Omitted due to exact collinearity: x8

             coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const      1084.08       871.267       1.244    0.2686
  x5            3.44059      4.75454     0.7236   0.5017
  x6          -85.1923      75.1719     -1.133    0.3085
  x7          -14.2303      32.3411     -0.4400   0.6783
  x9         -206.512      177.511      -1.163    0.2972

Mean dependent var   438.4000   S.D. dependent var   157.0967
Sum squared resid    37701.47   S.E. of regression   86.83486
R-squared            0.830261   Adjusted R-squared   0.694470
F(4, 5)              6.114250   P-value(F)           0.036508
Log-likelihood      -55.36373   Akaike criterion     120.7275
Schwarz criterion    122.2404   Hannan-Quinn         119.0678
rho                  0.348117   Durbin-Watson        1.191946

Excluding the constant, p-value was highest for variable 3 (x7)
```

Source: Own Research; Gretl 2012

But because there is no logical correlation between those variables and it did not show a correlation in the previous cases, we will ignore this correlation facing the problem of non efficient parameters. The Durbin Watson test of value 1.2 proved that there is an exact correlation in x8 variable. The p – value showed that non of the explanatory variables are significantly influencing the GDP per capita in Cambodia hence further analysis is not necessary.

Nepal

Figure 1.22: Correlation Matrix: Nepal

Correlation coefficients, using the observations 1999 - 2008
5% critical value (two-tailed) = 0.6319 for n = 10

x5	x6	x7	x8	x9	
1.0000	0.8258	-0.6763	-0.8625	0.8152	x5
	1.0000	-0.3784	-0.8541	0.8932	x6
		1.0000	0.7382	-0.2668	x7
			1.0000	-0.7039	x8
				1.0000	x9

y	
0.9187	x5
0.7898	x6
-0.3820	x7
-0.6590	x8
0.9011	x9
1.0000	y

Source: Own Research; Gretl 2012

The analysis of the correlation matrix reported a heavy correlation among the explanatory variables x5 and x6; x8 and x5, x6; x9 and x5, x6 (see Figure 1.22). Even though there is so much correlation, further analysis showed three significant explanatory variables. The constant, x5 variable - Primary Completion Rate, Total in percents of relevant age group, which reported very high level of significance hence the p – value is very low – 0.002. The variable x9, Total Public Spending on Education in percents of GDP, has proved only weak significance with the p- value of 0.08. The R squared coefficient has showed that 98% of variance in the dependent

variable, the GDP per capita, is explained by the variance in the explanatory variables (see Figure 1.23).

Figure 1.23: Multiple Regression: Nepal

Model 2: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-963.913	148.969	-6.4706	0.00294	***
x5	13.175	2.0278	6.4972	0.00289	***
x6	-3.00932	7.2601	-0.4145	0.69977	
x7	9.80097	8.34809	1.1740	0.30551	
x8	0.564849	0.336257	1.6798	0.16829	
x9	50.7836	22.1899	2.2886	0.08399	*

Mean dependent var	284.8000	S.D. dependent var	71.25978
Sum squared resid	573.8794	S.E. of regression	11.97789
R-squared	0.987443	Adjusted R-squared	0.971747
F(5, 4)	62.90900	P-value(F)	0.000681
Log-likelihood	-34.43856	Akaike criterion	80.87711
Schwarz criterion	82.69262	Hannan-Quinn	78.88550
rho	-0.359028	Durbin-Watson	2.695010

Source: Own Research; Gretl 2012

To prove the real significance of the explanatory variables which have low p – value, we need to omit the non significant ones, and test the variables one after one to show their individual coefficient of determination.

Figure 1.24: Coefficient of Determination of a Constant: Nepal

Model 7: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

	coefficient	std. error	t-ratio	p-value	
const	284.800	22.5343	12.64	4.95e-07	***

Mean dependent var	284.8000	S.D. dependent var	71.25978
Sum squared resid	45701.60	S.E. of regression	71.25978
R-squared	0.000000	Adjusted R-squared	0.000000
Log-likelihood	-56.32590	Akaike criterion	114.6518
Schwarz criterion	114.9544	Hannan-Quinn	114.3199
rho	0.986235	Durbin-Watson	0.206557

Source: Own Research; Gretl 2012

The coefficient of determination of the constant proved its significance, because the p – value is lower than 0.05 and thus it should be included in the model. The Durbin – Watson test proves that there is no correlation.

Figure 1.25: Coefficient of Determination for x5: Nepal

```
Model 6: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

             coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  x5           3.99908      0.218310     18.32    1.97e-08 ***

Mean dependent var   284.8000   S.D. dependent var   71.25978
Sum squared resid    22379.96   S.E. of regression   49.86644
R-squared            0.973880   Adjusted R-squared   0.973880
F(1, 9)              335.5631   P-value(F)           1.97e-08
Log-likelihood      -52.75606   Akaike criterion     107.5121
Schwarz criterion    107.8147   Hannan-Quinn         107.1802
rho                  0.942752   Durbin-Watson        0.317799
```

Source: Own Research; Gretl 2012

The coefficient of determination for the explanatory variable x5 proved very high significance ant thus it should also be included in the model. The p – value is lower than 0.05, which means that there is 95% significance of the x5 variable, and the coefficient of determination R – squared shows that the variance of dependent variable (GDP per capita) is from 97% explained by the variance of the explanatory variable x5 (The Primary Completion Rate). The adjusted R squared shows the same value, because all of the other variables were omitted.

Figure 1.26: Coefficient of Determination for x9: Nepal

```
Model 5: OLS, using observations 1999-2008 (T = 10)
Dependent variable: y

             coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  x9           80.0805      3.37818      23.71    2.02e-09 ***

Mean dependent var   284.8000   S.D. dependent var   71.25978
Sum squared resid    13506.38   S.E. of regression   38.73898
R-squared            0.984236   Adjusted R-squared   0.984236
F(1, 9)              561.9382   P-value(F)           2.02e-09
Log-likelihood      -50.23105   Akaike criterion     102.4621
Schwarz criterion    102.7647   Hannan-Quinn         102.1302
rho                  0.880473   Durbin-Watson        0.455794
```

Source: Own Research: Gretl 2012

P – value proved that the explanatory variable x9 (Public Spending on Education) has significant impact on the GDP per capita in Nepal. The variance in the dependent variable is from 98% explained by the variance in x9 (see Figure 1.26).

After the statistical analysis of the Nepal´s variables we can say that the statistical model for Nepal would look like as follows:

$$yt=284.8\ const + 3.999\ x5 + 80.08\ x9 + ut$$

u representing the stochastic part of the model, replacing all the other influential explanatory variables not included in the model.

6. Discussion

The statistical analysis showed that this particular model which was used to prove or disproved the **hypothesis**:

The level of education in the Least Developed Country has a significant positive impact on the country´s gross domestic product per capita.

Hence the hypothesis was tested not only for one country, but for four countries, ***the hypothesis was proved only partially***.

- PARTIALLY PROVED

In case of two countries, Benin and Nepal, the multiple regression showed that there are some indicators from the chosen ones, which have a significant and positive impact on the GDP per capita in Benin and Nepal. In Benin the only significant variable was the Expenditures per Student in Secondary Education, it means that the more the government would spend on the secondary education in terms of students, the better the education that is served to them. It means that the quality of secondary education will increase so as the demand for the secondary education students in the labour market, which afterwards will lead to an increase in the country´s GDP per capita. Fortunately, the percentage of expenditures per student in the secondary education increases each year, so the government in Benin is apparently aware of the importance of the secondary education system in terms of the economic growth.

In Nepal, there were two significant variables found. x5 the Primary Completion Rate and x9 Public Spending on Education from primary to tertiary. It is obvious, that there is a relationship between the amount spend by government on education and the level of GDP per capita. For Nepal it is also important how many students are successful in completion of the primary education. The high percentage of the population who is able to read and write is very important, especially in religious countries is Nepal surely is. Ramraj Gautam and co – authors proved that there is a high correlation between specific activities, including saying prayers, has a

significant positive effect on higher satisfaction and lower levels of depression among the adult population in Nepal. (Gautam, et al., 2007) In regards with the amount of public spending, it is obvious, as in the case of Benin, that the more the government spends on education and on the whole education system, the higher the quality of the students completing the different stages and the higher the demand for them in the labour market and hence higher country´s GDP per capita.

Many economists see the strong correlation between the economic growth and the schooling across many countries due to the improvement and building of a human capital. (Bils, et al., 2000) Krueger also found relationship between education and growth. (Krueger, et al., 2001) Of course, some author finds it difficult to look for such relationship. (Pritchett, 1999)

- PARTIALLY DISPROVED

In the case of the other two countries, Cambodia and Lesotho, there were no variables proved as significant. There may be several reasons for that.

Wrong data, omitted variables, miscalculations in time series or calculations which did not ricochet of the real trends. Other reasons not included in the statistical procedures may be that those two countries have majority of labour force employed in the agricultural sector, which only produces very low portion of the country´s GDP. In Lesotho, 86% of the labour force is employed in agriculture, but it comprises only 8.4% of the GDP. In Cambodia, 57.6% of labour force is employed in agriculture, but it produces only 31% of the GDP. Even though the absolute figures of educated people are increasing, unfortunately, they are not able to find a proper job or they just have to work in agriculture, which have very low influence on the GDP per capita. Other possibility is that the educational system is not of a high quality, so there is a low demand for graduates in the labour market.

- SIGNIFICANT INDICATORS

As it was proved in the case of the two countries, there were three indicators found to be significantly influencing, but there were two which have both countries in common: the amount of money spent either in the secondary level or through out all of the three levels of education. We can generally say that the more resources are invested in the educational system, in terms of money spent per student, better study materials, equipment or teacher´s salaries, the higher the quality of the system. When the graduates can provide experiences and skills of a high quality, because in the country, the standard of the graduates is well known, the employers will know that their expenditures on educated employees will repay them in term of a job done of a high quality and the employee is able to obtain more and more experiences and be responsible and independent. Well educated people can also be self employed, contributing significantly to the country´s GDP, increasing their standard of living and helping the whole family to escape from the vicious circle of poverty.

Eric A. Hanushek also proved that the student´s achievements are mainly due to the relationship between the outcomes from the school and measurable inputs invested in the educational process. The higher the quality and quantity of inputs, the better the students score in tests. (Hanushek, 1995) Contrary to this theory, Mr. Kramer, shows that the changes are statistically so modest, that the increase might not be worth the costs of the inputs. (Kramer, 1995)

- ABILITY TO GENERALIZE

Once the significant variables were found only in the cases of Benin and Nepal and moreover they were not the same variables, it is not possible to generalize the results on all Least Developed Countries. Each of the country has different culture, composition of GDP and different occupation of the labour force as well as different economic and social background and it is the responsibility of the particular government to decide which strategy and what resources are to be used to increase

the quality of the educational system and hence the economic growth and the growth of GDP per capita to increase the livelihood of the inhabitants.

- DETERMINATION OF THE COMPLEXITY OF THE TOPIC

The research showed that the topic of education in LDC is very complex and that are many more variables than the ones from the education sector that are influencing the GDP per capita of the country. It also showed that education is not influencing the GDP per capita in all of the countries and it means that the complexity varies from country to country and it is very hard to determine which of the factors are truly influencing the GDP and what portion of this variance is due to the level and quality of education, educational system and the graduates of different levels of education. To determine the real complexity, it would be necessary to focus on one particular country and conduct a very deep research right on the spot, exploring the educational system from the inside and also the demand of the labour market for the graduates of different levels of education.

SIDE OBJECTIVES

- FUNDAMENTAL BACKGROUND

The fundamental background was provided in the literature review part, including the list of Least Developed Countries, the conditions for acceptance and promotion from the category of the Least Developed Countries, the perception of the LDC from different worldwide organizations dealing with the situation of LDC and also the problematic of education in countries of such socio economic situation as LDC.

- DETERMINATION OF STAGES OF EDUCATION

The stages of educational system was also described in the literature review part, which was dealing with levels of education accordingly to the perception of United Nations, which are heavily dealing with this issues, recommending which

stages should be compulsory and which not as well as monitoring different educational indicators.

- SPECIFIC ASPECTS OF EDUCATION IN LDC

The specific aspects of the education in LDC was described throughout the paragraphs of the literature overview part and mainly in the chapter describing the disadvantages of education, which is focused on specific situations which may occur in the developing countries, that are barriers to integrate into the educational process. Those barriers are of many different kinds, from social or religion reasons, conflicts or weak school net until the opportunity costs for the families sending their children to schools.

7. Conclusion

The 49 Least Developed Countries are spread all over the world and they are inseparable part of the global interactions in terms of economic aspects like international trade and social issues like worldwide peace, but unfortunately they are more discussed due to their bad economic and social situations even though these countries are usually very rich in natural resources. Those countries suffer from overpopulation, malnutrition and usually low GDP. There are never ending debates how to help those countries and what is the most efficient and sustainable way of their improvement. There are internationally recognized institutions which are paying special attention to those countries, collecting and monitoring their socioeconomic indicators, providing reports about the countries situations and guidance how to improve the situation. The most believed way how to eradicate the poverty in such countries is the improvement of educational system, providing compulsory education to all inhabitants throughout the country, increasing the national literacy rates, diminishing the difference between genders and providing education of primary, secondary and tertiary level of education of a high quality to increase the demand for skilled workers in the labour market and hence create new job opportunities, reach a sustainable growth of development and make their

employees to be comparable with workers from other countries recognized as specialists. To achieve all that is not easy and what those countries need to achieve it is political stability, which will also attract foreign direct investments and increase the trustworthiness of the countries itself.

This particular research partially proved that education is significant in terms of the growth of GDP, but not in every Least Developed Country hence the way towards improvement cannot be generalized among all of the LDC, but oppositely has to be individualized on the basis of the specific conditions and needs of the particular country. It is the responsibility of the government to use all of its resources to be able to identify whether education is the best, most efficient and mainly sustainable way for the country to improve its social and economic situation relatively to others. Of course that whichever possibility the government chooses, there are some negatives about it. Even education brings some negative aspects to the society, especially in the Least Developed Countries. Those negatives are the opportunity costs which the students and their families have to undertake and carefully think through before the integration in to the educational system. If the situation in most of the families is delightful, there is malnutrition, the family income is very low or non, there is no arable productive land or very high risk of diseases, each hand in the household is needed and there is a sure choice of staying home, helping to produce some food or obtain some income for the family rather to go and spend whole days in the school. And finally, if the student is already integrated, there are still some occasions when they just have to stay home, as for example the harvest time.

Unfortunately, there is no recommendation, how the governments should operate to obtain well prospering inhabitants, sustainable economic growth and stable social environment. This topic is just too complex to be able to make some recommendation that would fit all of the Least Developed Countries. It is undeniable that education can provide higher national literacy rates and some fundamental background of mathematics brings a certain freedom which enables the people to

deal with problems, find effective and sustainable solutions and in the first row to help themselves and also consider future effects of their actions, it is only necessary to give them the chance to obtain such education. Hence to focus on education can be recommended to all of the governments of the LDC, because without skilled people who are able to think all alone and take responsibility, there is no possible improvement, growth, no development.

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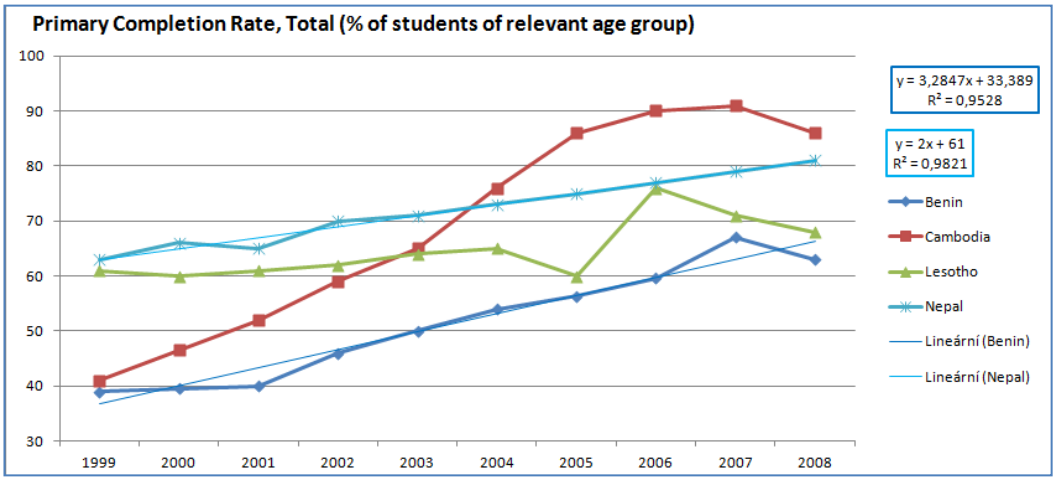
9. Annexes

9.1 Time Series Computations

Figure 9.1: Primary Completion Rate; Trend and Time Series

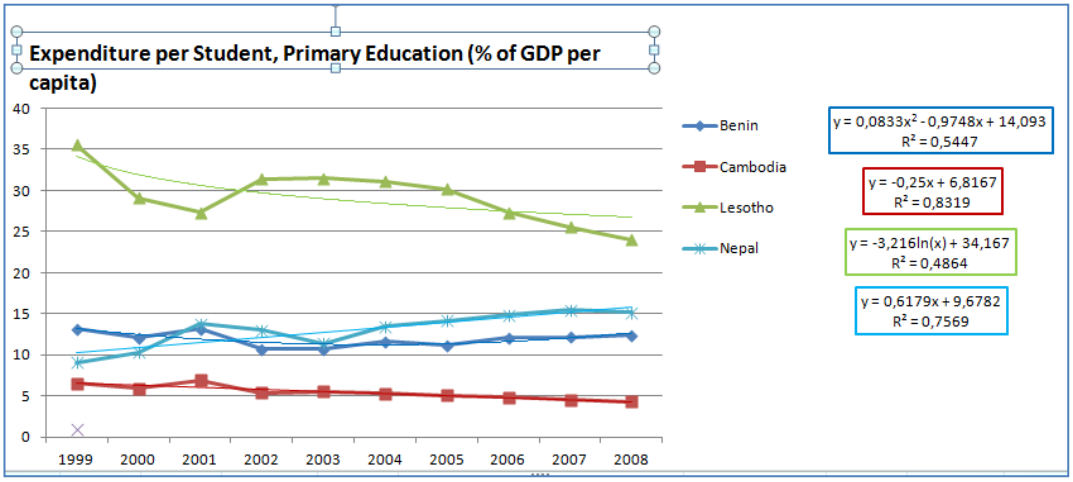
Primary Completion Rate, Total (% of relevant age group)				
	Benin	Cambodia	Lesotho	Nepal
1999	39	41	61	63
2000	39,5	46,5	60	66
2001	40	52	61	65
2002	46	59	62	70
2003	50	65	64	71
2004	54	76	65	73
2005	56,3819	86	60	75
2006	59,6666	90	76	77
2007	67	91	71	79
2008	63	86	68	81



Source: Own Table and Graph; Data: World Bank

Figure 9.2: Expenditures per Student, Primary Education; Trend and Time Series

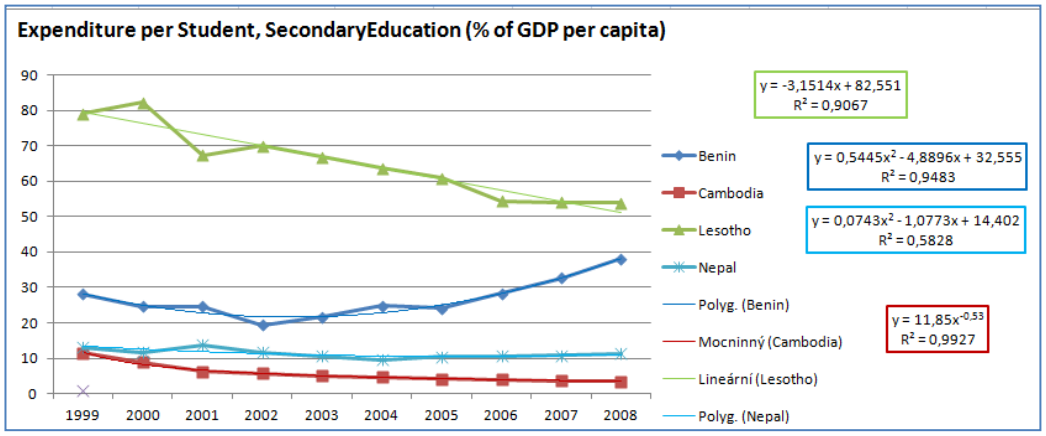
Expenditure per Student, Primary (% of GDP per capita)				
	Benin	Cambodia	Lesotho	Nepal
1999	13,2	6,5667	35,6	9,1
2000	12,1	5,9	29,1	10,3
2001	13,2	6,9	27,3	13,8
2002	10,7	5,4	31,4	13
2003	10,7	5,5667	31,5	11,4
2004	11,6	5,3167	31,1	13,4876
2005	11,2	5,0667	30,2	14,1566
2006	12,1	4,8167	27,3	14,8256
2007	12,2	4,5667	25,6	15,4946
2008	12,4	4,3167	24	15,2



Source: Own Table and Graph; Data: World Bank

Figure 9.3: Expenditures per Student, Secondary Education; Trend and Time Series

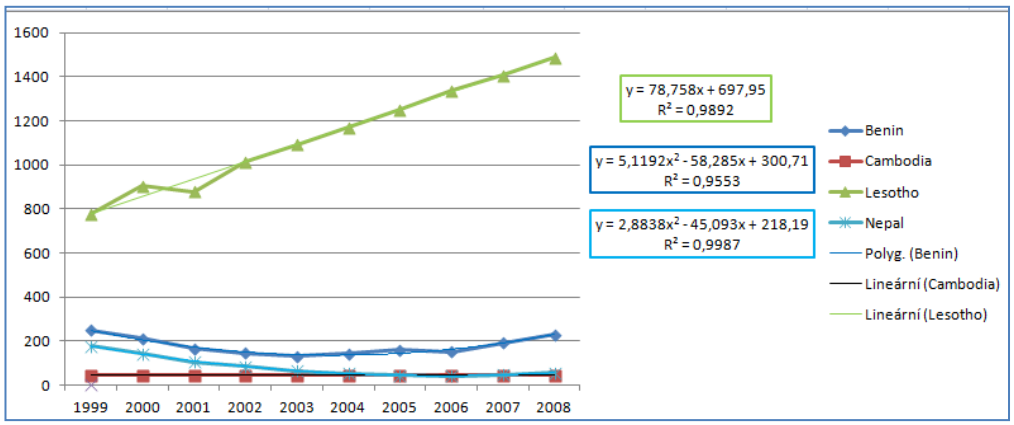
Expenditures per Student, Secondary (% of GDP per capita)				
	Benin	Cambodia	Lesotho	Nepal
1999	28,2102	11,5	79,1	13,1
2000	24,6	8,9	82,2	11,6
2001	24,6	6,3	67,4	13,8
2002	19,3	5,68	69,9454	11,6
2003	21,6	5,05	66,794	10,6
2004	24,8	4,59	63,6426	9,6
2005	24,1	4,23	60,8	10,5002
2006	28,2872	3,94	54,4	10,5372
2007	32,655	3,7	54,1	10,7228
2008	38,112	3,5	53,8	11,3



Source: Own Table and Graph; Data: World Bank

Figure 9.4: Expenditures per Student, Tertiary Education; Trend and Time Series

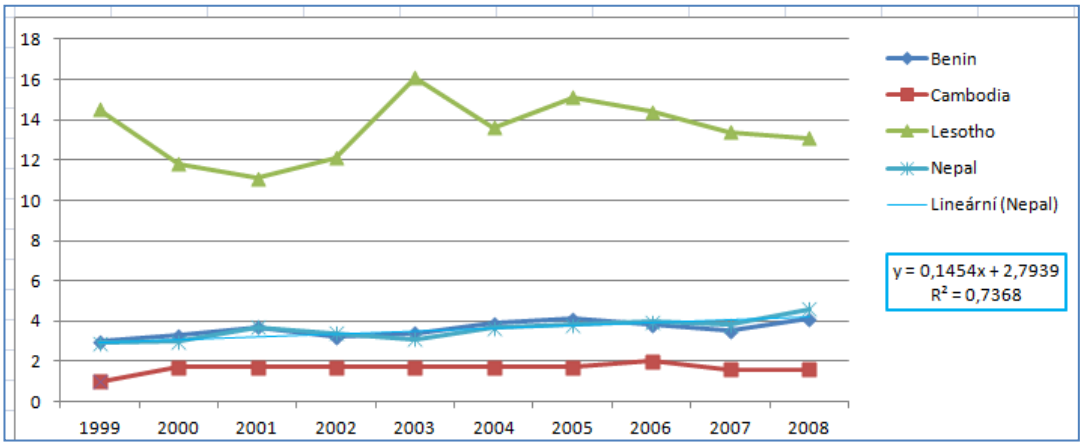
Expenditures per Student, Tertiary (% of GDP per capita)				
	Benin	Cambodia	Lesotho	Nepal
1999	247,546	43,6	776,708	175,9808
2000	212,7	43,6	902,9	141,6
2001	164	43,6	877,3	104,7
2002	144,3	43,6	1012,982	85,4
2003	131,8	43,6	1091,74	65,6
2004	140,8	43,6	1170,498	51,4488
2005	160,8	43,6	1249,256	43,8452
2006	149,8	43,6	1337,5	42,0092
2007	190,802	43,6	1406,772	45,9408
2008	229,78	43,6	1485,53	55,5



Source: Own Table and Graph; Data: World Bank

Figure 9.5: Public Spending on Education; Trend and Time Series

Public Spending on Education, Total (% of GDP)				
	Benin	Cambodia	Lesotho	Nepal
1999	3	1	14,5	2,9
2000	3,3	1,7	11,8	3
2001	3,7	1,7	11,1	3,7
2002	3,2	1,7	12,1	3,4
2003	3,4	1,7	16,1	3,1
2004	3,9	1,7	13,6	3,6664
2005	4,1	1,7	15,1	3,8118
2006	3,8	2	14,4	3,9572
2007	3,5	1,6	13,4	3,8
2008	4,1	1,6	13,1	4,6



Source: Own Table and Graph; Data: World Bank