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Faculty of Economics and Management
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**Various approaches to measuring quality of life in the
Republic of Kazakhstan**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Alina Gatina

Business Administration

Thesis title

Various approaches to measuring the quality of life in the Republic of Kazakhstan

Objectives of thesis

After the independence of the Republic of Kazakhstan, improving the population's quality of life is the main task from the point of view of the socio-economic policy of the state. The Bachelor Thesis aims to study and identify the quality of life of the population in Kazakhstan based on the assessment of socio-geographical, economic-geographical, environmental factors and develop recommendations for their improvement.

Methodology

In the Bachelor Thesis, modern and traditional research methods: descriptive, comparative geographical analysis, methods of mathematical statistics will be used. The information base of the research will consist of literary sources of a scientific nature, official Internet sites in the Republic of Kazakhstan, periodicals (newspapers, magazines). Statistical analysis will handle with official data of the Statistics Department of the Republic of Kazakhstan and the Ministry of Health of the Republic of Kazakhstan. Methods of exploratory data analysis as well as time series analysis will be used to describe the current state and development of selected indicators of quality of life.

The proposed extent of the thesis

30-40 pages

Keywords

quality of life, Republic of Kazakhstan, statistical analysis, time series

Recommended information sources

FIELD, A. Discovering statistics using IBM SPSS statistics. Thousand Oaks: SAGE Publications, 2013. ISBN 978-1-4462-4917-8.

KALYMBEK, B. Problems of legal regulation of environmental protection from pollution by industrial waste and consumption in the Republic of Kazakhstan. Almaty, 2016. ISBN 978-3-903115-22-4.

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SHOKAMANOV, Y. Trends of Human Development in Kazakhstan. Agency of the Republic of Kazakhstan on Statistics. Almaty, 2001. ISBN 9965-01-962-2.

Expected date of thesis defence

2021/22 SS – FEM

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Declaration

I declare that I have been using only the resources mentioned above to bring a topic of “Various approaches to measuring quality of live in the regions of Kazakhstan” As being an author of the bachelor thesis, I declare the thesis doesn’t break any copyrights and doesn’t correspond to any plagiarism.

In Prague on _____

Alina Gatina _____

Acknowledgment

I would like to thank my thesis supervisor Zuzana Pacáková for her advice and support. Also, I would like to thank my mother for all her support during my studies.

Various approaches to measuring quality of life in the regions of Kazakhstan

Abstract:

The purpose of the bachelor thesis is to analyse different measurements that are used to identify the quality of life in Kazakhstan. The thesis will demonstrate the case of the Republic of Kazakhstan. Nevertheless, the quality of life could be measured from different perspectives, I personally think that monetary matter and economic development of any state, can show whether the country is developed or not, it somehow reflects on population and their level of life quality. The topic investigates how exactly macro-economic indicators impact the quality of life, especially Human Development Index.

Therefore, the author compares two different measurement tools, such as HDI and World Value Survey, in which Kazakhstan has recently participated.

The Bachelor Thesis consists of two main parts, theoretical and practical parts. Where, theoretical part covers most the research papers that studied the impact of macroeconomic variables on the HDI. Therefore, the author plans to use Multiple Linear Regression model to verify the stated hypothesis which at the end will be either approved or disapproved.

Key words: HDI, Population, quality of live, wages, unemployment rate, life expectancy for health, GDP.

Různé přístupy k měření kvality života v regionech Kazachstánu

Souhrn

Cílem bakalářské práce je analyzovat různá měření, která se používají k identifikaci kvality života v Kazachstánu. Práce bude demonstrovat případ Republiky Kazachstán. Nicméně kvalita života by se dala měřit z různých úhlů pohledu, osobně si myslím, že měnová záležitost a ekonomický vývoj každého státu může ukázat, zda je země vyspělá nebo ne, nějak se to odráží na populaci a úrovni jejich kvality života. Téma zkoumá, jak přesně makroekonomické ukazatele ovlivňují kvalitu života, zejména Index lidského rozvoje.

Autor proto porovnává dva různé nástroje měření, jako je HDI a World Value Survey, kterých se Kazachstán nedávno účastnil.

Bakalářská práce se skládá ze dvou hlavních částí, teoretické a praktické. Teoretická část pokrývá většinu výzkumných prací, které studovaly vliv makroekonomických proměnných na HDI. Proto autor plánuje použít model vícenásobné lineární regrese k ověření uvedených hypotéz, které budou nakonec buď schváleny, nebo neschváleny.

Klíčová slova: HDI, Populace, kvalita života, mzdy, míra nezaměstnanosti, GDP.

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Acronyms

CIS Commonwealth of independent States

FDI Foreign Direct Investment

GDP Gross Domestic Product

GER Gross Enrolment Ratio

GNP Gross National Product

HDI Human Development Index

OECD Organization for Economic Cooperation and Development

Q&A Questions and Answers

UNCTAD United Nations Conference on Trade and Development

UNPD United Nation Development Program

WHO World Health Organization

WVS World Value Survey

1.Introduction

The bachelor thesis is dedicated to describing the standards of living in the Republic of Kazakhstan. Since I was born and raised in that country and wanted to share my opinion in that regards.

Over the last two and a half decades, the Republic of Kazakhstan had shown a big improvement of economic aspects, this actively demonstrates an increase of GDP per capita, since the Republic of Kazakhstan has received its independence in 1991. Kazakhstan has ranked 51st place out of 195 countries, according to United Nations Report (2019). Which in truth, shows the development of a country as a unit, for the past 31 years. However, I will be able to distinguish whether the reality corresponds to the data provided by UNCTAD, OECD, WVS, UNDP, UNESCO and extra. Since I was born in Kazakhstan and certainly has experienced the life measures of Kazakhstan or another words, I know an overview of “Human Development” which consists of basis of income, health, and education program. Obviously, those are not the only criteria that I will base the thesis on, as Easterlin (2001) states, income is not a part of happiness, as well as materialistic things, the level of happiness is something bigger that. Human Development Index however, is such an indicator that lures everyone’s attention in a way, that it demonstrates how well developed the country is? As one of the main aspects of FDI’s (Foreign Direct Investments) human capital is very relevant for such an indicator, so from investors perspective it certainly is something to look at primarily. Today, there are so many studies and investigations are done on that particular topic and to really understand who is right seem to best hard. I will try to select the right framework of resources for analyzing theoretical part. For example, as: Borensztein (1998) argues a positive impact on economic by attracting FDI’s as well as it escalates the level of human capital in addition, whereas Blomstrom (2000) found no evidence, whatsoever to conclude, that the level of education is an important factor for FDI’s inflows. My personal assumption, that FDI have improved the quality of live partly, based on the increase of the GDP per capita and Income raise. But still, it is very hard to distinguish.

The country’s economic success of Kazakhstan would not have been possible, if not for its economic potential (Naseb, 2005). At the same time, considering the territory and its neighboring countries. But still, measuring human development is quite a complex topic (Ferguson, 2012) as it entails the ranging from life expectancy to political freedom, and many more.

Basically, I plan to analyze how volatile Human Development Index in Kazakhstan has been for the past 29 years of Data Trends, considering the other social aspects such as: quality of life, average income per capita, education level, and yet I want to consider the other factors that affect quality of life, the factor based on macroeconomic indicators such as Foreign Direct Investments, Unemployment rate and Gross Domestic Product.

The measurement of human development is still a questionable topic to discuss. Sen (1992) developed in his thesis the main objective of development is freedom. It highlights 5 types of instrumental freedom: political freedom, economic facilities, social opportunity, guarantee, and protective security. Another example is a President Roosevelt, who actually build his theory based on five different freedoms, freedom from hunger, freedom from ignorance and disease, freedom to organize and vote, freedom to choose among political options, and freedom from want and need. All of them were written down into the Universal Declaration of Human Rights of the United Nations in 1948. Still, 70 years later, no country has achieved all the listed above, although some of them are nearing benchmark of all freedom criteria.

The thesis is however devoted to analyzing the Human Development in the Republic of Kazakhstan. I have taken into consideration all the variables, that are supposed by Ferguson (2012).

The first part will be dedicated to theoretical overview of Human Development and its Index, and factors belonging to measure HDI. Basically, the whole concept of Human Development will be demonstrated in the first part, based on theories, articles and literature reviews and its explanations. Formula will be also shown in that part.

The second part is however dedicated to more of a practical framework, where author will analyze secondary data, published by Statistical Institution of Kazakhstan. The quantitative research will be done, analyzing Time-Series.

2. Objectives and Methodology of Thesis

2.1 Objectives

The main goal of the project is to define different approaches of measuring the quality of life in Kazakhstan. I decided to take into consideration the Human Development Index and its sub-indicators such as (educational level, average income, life expectancy at birth) but also, I want to analyze which macroeconomic factors influence the Human Development the most. Also, World Value Survey is the second way of measuring the quality of life which I base my thesis on. I want to analyze the correlation between all the mentioned variables of the macroeconomy and involve the sub-indicators of Human Development Index. It is assumed that the welfare of any nation is based on the monetary aspect, and I am about to analyze that aspect in this paper.

2.2 Methodology

My methodology consists of two different approaches, qualitative and quantitative. I use the theoretical background of different research papers where macroeconomic indicators were applied to analyze the correlation between HDI and unemployment rate, Foreign Direct Investments and Average Income. I also describe the development of each variable within the timeframe of 2000 up to 2020. The sub-indicators of Human Development Index were also taken into consideration to analyze which of them is the strongest. All the data will be of secondary research, retrieved from the World Bank, UNDP, NatzBank.kz. I will use Excel software to run a Linear Regression Model, where Human Development Index will be dependent variable and the rest will be independent, explanatory variables. I also state three hypotheses to see which of the macroeconomic indicator influence the HDI the most.

Hypothesis

- 1). The increase of inflow of FDI into the country will positively affect the HDI.
- 2). The high level of unemployment will negatively affect the HDI.
- 3). If Average Income increases (USD) it will positively impact the HDI.

Methodology base: I will be using Multiple Linear Regression Model which is an extension of Linear Regression Model, where several explanatory variables will be processed in order to define the correlation and impact on the dependent variable.

I will test my model of the following verifications steps:

Autocorrelation: by using Durbin-Watson test.

$$DW = \frac{\sum_{t=2}^n (e_t - e_{t-1})^2}{\sum_{t=1}^n e_t^2}$$

(1)

Normality:

The Jarque–Bera statistic is given by:

$$JB = \frac{N}{6} \left(S^2 + \frac{(K-3)^2}{4} \right)$$

where

N = sample size

S = skewness

K = kurtosis

(2)

A normal distribution will always close to 0, the negative skewness indicates that it tilts to the right and positive skewness indicates that it tilts to the left.

- If skewness is less than -1 or greater than 1, the distribution is highly skewed.
- If skewness is between -1 and -0.5 or between 0.5 and 1, the distribution is moderately skewed.
- If skewness is between -0.5 and 0.5, the distribution is approximately symmetric. (Sematech, 2020).

Source: Hlavsa, T & Pacáková, Z Statistics II. (2020).

3. Literature review

In the chapter, I will be covering the basic concept of Human Development Index, measurement tools for HDI. All the necessary variables will be demonstrated and explained in a concise form. I have selected few literature resources and reports on Human Development criterion, as human potential and its development is quite hard a complex economic category and has qualitative and quantitative characteristics. There are many discrepancies among the different theories and calculation methods, I will go through two main Indices to clearly analyze, whether the number can express on how people life in their daily routine lives.

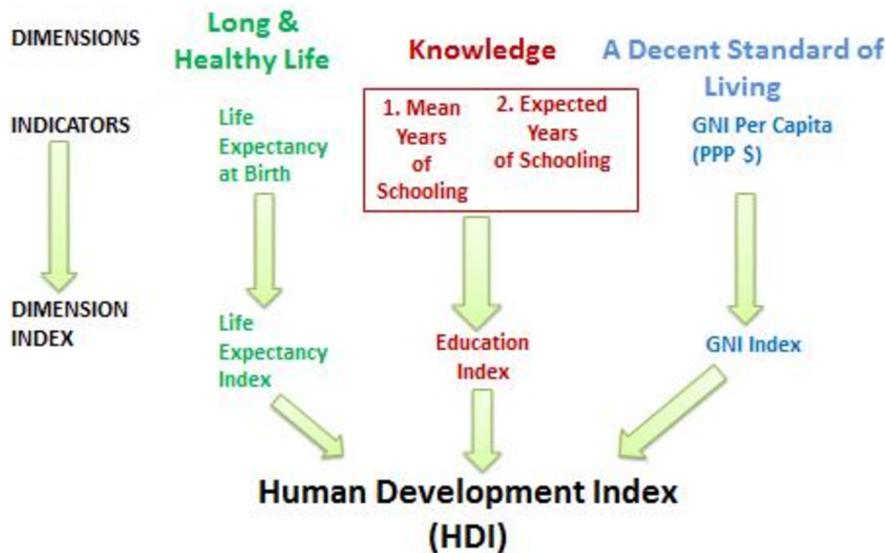
3.1 Concept of Human Development Index

The human development index has been published by United Nations in 1990, - The Human Development Report, by Mahbub ul Haq. It has considered different aspects of performance for most countries of the world. The HDI is an Index, of the total overall performance of any country (Mahbub,1990) and still is a very clear topic that many philosophers, politicians, and economists have long thought on how dimension can be measured based on performance of a country.

“Wealth is evidently not the good we are seeking; for it is merely useful and for the sake of something else.”- Aristotle, The Nicomachean Ethics.

In the HDI, there are three different performance criteria that should be considered (Mahbub,1990) aspects of health, education and knowledge and standards of living. Based on that, there is a separate index produced for health index, education index and a standard of living index. Combining this indicis will be resulting the weight of 1/3, gives the HDI (Sagar & Najan, 1998).

Figure 1: Structure of the HDI



Source: HDR,1990.

Sen (2009) affirmed, the motivation behind the “Human Development Approach” by Mahbub ul Haq (1990) is to move on from the means-based perspective of the gross national product (GNP) on concentrating, to the extent that the available international data would permit, on aspects of human lives themselves. As shown above, in Figure 1, the index is a composition of three different aspects.

3.1.1 Health

Health is the most valuable assets in our life. Health is measure by a life expectancy at the time of birth. The measure of so-called “life-expectancy” considers the standard of the healthcare system in a certain country. In that regards, the life expectancy is strongly correlated to the healthcare system, which isn’t strange. Different literature approaches have detected a positive correlation between life expectancy and a good healthcare system, on a global comparison (Leung & Wang, 2003). On the other hand, Barro (1997) came up with a model, where he proofed that based geographical basis of a country, the health care costs are a fixed and different percentage of GDP for every part. He concluded that relationships between income, or GDP and the healthcare system is not really clear in the sense of causality. Does the GDP increase because of people become more older, hence the expenditures for healthcare system increase as well? Or vice versa, Does the life expectancy go up because of higher expenditures on healthcare due to higher total income? In the analysis of (Barro, 1997) it opens a very interesting discussion point, where poor countries struggle more and more due to the fact: low life

expectancy means a low total income and as a result a low healthcare expenditure. In order to break out this circle, it will be very teeming, and difficulties might occur.

Figure 2: Correlation between healthcare and life expectancy

Countries	Health expenditure per capita (PPPS)	Life expectancy at birth (years)	Survival to age 65 (%)*		
			Male	Female	Average
Group 1	24	46	33	39	36
Group 2	42	52	41	46	44
Group 3	68	56	48	54	51
Group 4	98	64	60	69	65
Group 5	170	65	61	72	66
Group 6	256	68	65	75	70
Group 7	362	69	64	79	71
Group 8	592	71	68	82	75
Group 9	1,193	76	78	88	83
Group 10#	2,171	78	82	91	86

*Percentage of newborns who would survive to age 65 according to current age-specific mortality rate.

*Group 10 contains 3 more countries than other group, to exhaust the full sample of countries.

Source: Leung & Wang (2003).

The given table shows the lowest to the highest healthcare expenditures per capita. As it is quite obvious from the table above, the relationship between healthcare expenditures and life expectancy is quite strong and positive. I noticed that the percentage of GDP on health is depending on the total income.

The world average for example shows 5.5% of GDP goes to health expenditures. This average contains a low 4.5 % of GDP for countries with low income, and 9.7 % for countries with high income. This finding corresponds with the model of Barro (1997) presented; different parts of world spend different percentage on a healthcare system. As assumed, on geographical basis, is the total income is more or less the same.

Index 1: HDI calculation

$$HDI_i = \frac{country_i value - value_i \min}{value_i \max - value_i \min}$$

Source: UNPD,1990.

Barro (1997) claims that, based on geographical aspect, countries within the same regional territory are easily to compare and analyze. An important note about the usefulness of life expectancy as a health indicator is that high life expectancy may not mean a healthy lifestyle. It is known that

with an increase in life expectancy, the average number of years of illness increases. Since the literature makes a distinction between total life expectancy and healthy life years expected, this distinction assigned here is responsible (Mathers et al., 2001). But even after adjusting for the average number of years of unhealthy life, the difference in outcomes is still significant.

3.1.2 Education

The educational component of the HDI is a mixture of two factors. The first is an adult literacy rate and the second factor is (GER) Gross Enrolment Ratio. Where, measuring only the overall enrollment rate will lead to a fuzzy ranking list that measures only the current effectiveness of factor education.

The adult literacy rate is defined as “the percentage of population aged 15 years and over who do both, writing and understanding a short and simple statements on people’s daily life (UNESCO, technical specification on adult literacy). Generally, "literacy" also encompasses "numeracy", the ability to make simple arithmetic calculations. The adult literacy rate is estimated annually. The estimation is based on different surveys/consensus, depending on researchers. Oswald (1997) claims that consensus can be used, only in case when data is not available for a certain country, or the data which cannot be trusted. The percentage rate is based on surveys that aren’t adopted among countries. Because of these discrepancies in methodology, comparison between countries and over time are not as high as it would be desirable. He explains that standard rate for this methodology implication is 99 percent on literacy rate for well-developed countries. This 99 percent is chosen to diminish that difference for these not well-developed countries. Which makes it logical. Countries are being compared at the same standards, but some of them can’t keep up with these standards, which make an enormous difference in explaining the Human Development Index for less-developed countries, and there are so many reasons for that, such as: cheating data, missing data, data is not up to date. In case there is absolutely no data available for the literacy rate, UNESCO (2018) has made some estimates based on consensus among researchers. This was especially the case for countries like Guinea-Bissau, Uganda, and Papua New Guinea. The outcome in percentages for the literacy ratio was pretty much the same, of 94.6% gives the score of 0.946.

UNESCO, defined GER as “total enrollment in primary, secondary and tertiary school, regardless of age lived”. Which is meaning, a percentage rate of people from a total population of a country who have entered a tertiary school, which in our standards supposed to be university. GER is measured in (%). The higher the ratio, the higher the education level of a country. The problem defined

by (Oswald, 1997) was that most countries the given research is based on a long-run investigation, and they are mostly not performed on an annual basis. Researcher's comparisons in that case are not possible, because of the accuracy of the data. In this case, when comparison is not possible, they are represented by the standards of UNESCO. The highest and the lowest levels are away from each other. World Bank (2018), the highest GER is Ukraine (100%), where the lowest is Somali (5%).

Oswald (1997) states, the literacy rate is a good indicator of basic knowledge for writing and reading part, whereas GER indicator is for a higher-level education, combination of both, according to UN, should be leading to an average level of education in a country. GER and literacy rate are combined in the final Education Index. It is not based on equal weight, but weight of the literacy is 2/3 against 1/3 for GER. Since literacy is considered to be more important than higher education. He explains that fact as, labor force needs at least a small level of education, basic knowledge needs to work and be accounted for human capital, especially working.

3.1.3 Income

Income is measured in GDP per capita in PPP\$. When HDI report was firstly published in 1990, income was a key measure tool to evaluate countries performance and its poverty line income. All income above poverty line income, haven't been considered as a contribution to HDI. Poverty line was chosen as a poverty international line of 1USD a day, for living, adjusted to local currency using PPP (WTO, 2021). Due to the fact that income, which is higher than the poverty line limits, and it accounts as "people's choices" are wider if they have higher income. Burda & Wyplosz (2001) explain the difference of GDP and GNP, where GDP is accounted on location base, and GNP is accounted on ownership base. As a result, HDI uses GDP. And that's why, UN uses GDP as well, it evaluates properly the country's performance. Earnings realized in that country, will most likely spend in that country, which creates a domestic money flow.

Sorensen & Whitta-Jacobson (2005) explain the difference between GDP and GNP. It is particularly small, only in case where residents of a particular country work abroad, there is a big difference than, that might occur. Ireland is the example, countries of Far East, relatively high amount of people work in the shipping industry and therefore almost never work in their own country.

Morgenstem (1963) claims that, there are however, problems with GDP per capita in the HDI. The problem is concerned with the fact that HDI income figure is supposed to measure the "degree to which people in the country can have accesses to relevant resources for a decent standard living. Yet, GDP per capita is much more problematic, for more reasons. Dombusch & Fischer & Startz (1998)

comment, that it is not possible to buy a decent standard living. For example, clean water and clean air or even a public playground for kids, cannot be purchased by individuals, it should be supplied publicly. Secondly, GDP per capita does not consider the relative necessities. To some extent HDI, has adjusted for such necessities, See UNDP (1993, p.106.). But still, the HDI uses the real GDP instead of nominal one because, and thus involves the fluctuations in purchasing power caused by inflation (change in price over a time). The index adjusts in dollars, to analyse the degree of openness of the economy. Even the adjusted real GDP per capita implicitly assumes that individuals in countries with the same amount of income will be able to satisfy their needs to the same extent. Dornbusch & Fischer & Startz (1998) stated, there are a few ways to make GDP indicator more sensitive to the necessities relative to different countries as well as actual possibility sets of enjoyment of people, personal features, and environmental factors such as:

- The climate conditions
- The proportion of the population that is disabled
- The degree to which society has infrastructures allowing to the free movements of goods and people.

The main issues however rise when GDP is compared between countries based on the income. Since (PPP\$) is used as a measurement tool, when et. el. Fisher (1998) the exchange rate comes to mind and makes a big difference in comparing two different countries. Because of the conversation rate in that nominal exchange rate might be different, and probably will, over a certain period of time. Xu (2003) reminds that (PPP\$) should consider the comparison of price for a basket of goods, between countries. Using the (PPP\$) for all countries in the world, you get a relative exchange rates for different countries. He gave an example of Zaire and Ethiopia in 1987.

GDP per capita in Zaire is \$130 and in Ethiopia \$150 (1987). Using the PPP\$ this GDP per capita rises respectively to \$454 and \$220. In case of Zaire the GDP per capita is almost 3.5 times bigger with the PPP\$ than in case with the nominal exchange rates.

Summary statistics on HDI

Finally, a complete list of indicators is compiled for all countries. The list is divided into 3 categories: high human development, average human development, and low human development. These categories are based on the final aggregate score for all aspects of the HDI. The UN defines high human development as between 0.800 and 1000. Average human development is an estimate of 0.500 to 0.799, and finally, low human development is an estimate in the range of 0.000 to 0.499. These boundaries are arbitrary but looking at the list it seems that the boundaries are the same as "common sense." Scientific, fundamental thought about boundaries is not available.

As the reader scrolls through the list, you will notice that there is no specific split point for the various aspects of the HDI, it is a specific combination of the three that will lead to a specific rank. To give an idea of the performance of countries on various aspects of the HDI, the breakdown points are indicated. The line between high and medium development in life expectancy is approximately 70 years. This is quite a lot. For the adult literacy rate, there is no specific indication of the difference between high and medium developmental levels. To give a very rough idea, all highly developed countries have rates above 95 percent, and the middle countries are below this border. Exceptions are possible, for example Kuwait is a highly developed country with an adult literacy rate of 80.9 percent. But very high GDP per capita will lead to a relatively high ranking in the HDI; This is probably due to the extensive oil business in the country. It is even difficult for GER to define a breakpoint. A rough estimate would lead to a GRP for high-income developing countries of 80 percent or more. The problem with income is the same as with other aspects. A rough guideline would result in a lower income limit of around US \$ 10,000 PPP.

It is difficult even to pinpoint the difference between average and low levels of human development. The estimated difference between low and medium human development in terms of life expectancy is about 55 years. Thus, the range of average human development for life expectancy is approximately 55 to 70 years. The lower bound for the average human development of the adult literacy rate is about 60 percent, and for the GER this percentage is also about 60percent. While there are quite a few exceptions for these two ratios from a country perspective, this provides a rough interpretation of the range in which the HDI scores fall between the categories depending on different dimensions. Finally, a GDP per capita measure would lead to an estimate of about US \$ 1,500 PPP.

Although, for example, Kenya and Congo have GDP per capita of about US \$ 900 in PPP, they are within the average development rate due to relatively good educational performance.

Appendix 1: provides a complete list of data available for all countries in the HDI. This list of data is taken for 2019. Human Development Reports. There are, however, the data for HDI trends over years, but I decided to describe this data related to Kazakhstan Republic. The reader should see the excel source, to navigate easily (UNDP Report, 2019).

3.2 World Happiness Report

Happiness is the feeling our world is based on, hence everyone wants to be happy. But what makes us happy? It obviously depends on the preferences of population or individual. Which indicator in life has an influence on individual well-being? That particular chapter is focused on World Happiness Report and other measures of quality of life.

Basically, the World Happiness Report is published on an annual basis by the United Nations Sustainable Development Solutions Network which consists of national happiness and data analysis from various perspectives. The first and ever released Happiness Report was released in 2012 by the John.F, Helliwell & Richard Layard, and Jeffrey Sachs (WHR, 2012). The Report was focused on Well-being, Happiness and partly had a focus on Defining a New Economic Paradigm, drawing international attention. In the technical Box N.1 of World Happiness Report of (2020) it explains three main criterion that measure the happiness level. Life evaluations, positive and negative emotions. The Gallup World Poll which is a principal core of data for assessing lives around the globe, has not been able to conduct the face-to-face interview. The research is done in 165 countries in 140 languages. Where the main measurement is a ladder, with steps numbered from 0 up to 10, whereas 0 is the worst possible life for you and vice versa, 10 is the best possible life for you. Also known as a (Cantril survey of numeric type or Gallup-type survey which is mentioned above). Easterlin (1974) was the first ever person to use these types of surveys to measure the quality of life in his country. He concluded that these both methodologies led to the same results where, a person who felt needed and valued in life, had a higher happiness level after all. And yet, at this point, the answers were fascinating, because all participants seemed to be happy, regardless of his/her occupation or on what type of ladder in life the belonged to. The first and ever data that was prescribed as a happiness data, was done by Easterlin (1974). He showed the people are usually happy in case when they do have fewer financial worries, or more financial security and what is more interesting is that people who have higher income, did not report an increase of happiness. Another fact that Easterlin came up with

many papers, including his paper and also Bruni & Comim & Pugno (2008), is that happiness is shaped as U-shaped curvature in lifecycle. This means that people are happier in their Middle Ages, concluded that aging a decline in happiness.

World Happiness Report focus on so many indicators at once based on – Gallup World Poll, there is a short list of indicators that I can eventually apply to analyze the quality of life in Kazakhstan

- Gross Domestic Product Per Capita (Purchasing Power Parity).
- Social Support
- Health life expectancy at birth
- Freedom to make choices
- Generosity
- Perception of corruption

Anielski (2007) defines happiness as “The ultimate human desire for spiritual well-being characterized by feelings of safety, satisfaction, contentment, health and joy”. In Greek eudaimonia is the word for happiness, explaining (well-being) and daimon is a (spirit).

WVS (2014) concluded that social support has a major impact on quality of life of people in every country. The work was even recognized by the OECD (2015) where it consisted of over 290 questions on different topics of a daily life of human-being. However, WVS data cover a large representative set of countries ranging from severely underdeveloped to industrialized nations. As a purpose of study, World Value Research usually operates by waves, to see the comparison between waves and analyze the data properly and social support is based on these types of questions that aim to identify the inner peace and happiness, an example: Importance of family to you? or, how long have you been gone without a family support for more than 12 month? And extra.

Inglehart (1994) has conducted a survey in many countries in regards of social and political aspects. As a result of WVS Association, intentions were to verify the hypothesis that economic and technological changes transforms society’s values, hence has a positive impact of quality of life. These changes are only possible to reach when there is a full transparency of a state, where officials publicly demonstrate that economy indicators are actually increasing, based on technological investments and research and development divisions. Developed countries such as (Norway, Ireland, Germany, Sweden) have demonstrated a strong strategy and evidence in the technological division. Hence as a fact, had a positive correlation between quality of life and overall economic growth.

Anielski (2007) states, the root of corruption might have a long link within a certain focus group (family, relatives, friends and extra). He defined as a fact, that people feel way more devastated because of that certain factor. He defined a strong relationship between corruption and quality of life. Since it explains that, if a person has got relatives or friends who are way better-off in a certain field of life, the person might get a better benefit based on that relationship, which initially upsets the rest of the people, hence it might affect the further indicators such as (average income, consumer index and even average life expectancy). Which in truth makes total sense.

Bardhan (2006) concluded that corruption lower an economic growth and hence it may reduce the incentives of private investments and distort public investment decisions. Tanzi & Davodi (1997) concluded that corruption induce talented people into rent-seeking activities. Most of the empirical studies have concluded that it has a negative effect on people's lives overall. Murphy, Shleifer & Vishny (1991) stated that officials might bring relatives to work for the governmental institutions and it has an enormous effect on people who doesn't have such an advantage. They also called it as "an unfair advantage".

Søreide (2006) concluded that corruption has direct effect on HDI. It is essential to consider. Countries within a Medium or Low Human Development data table (See Index 1) can be taken into consideration as risky states, where corruption proliferates in every aspect of live, social, political, institutional, and so on.

3.3 Economic development and its influence on quality of life

Economic factors seem to have an influential role on determining the level of human development, it also considers unemployment rate and economic growth has got a strong effect on individual's well-being, and his level of satisfaction. Still, it is very hard to recognize both factors. From the following we see that the life quality of population of a low economic country does not necessarily correspond to the quality level overall, the same thing applies to very high-developed countries.

Recently, Easterlin (2003) suggested that economic growth is tightly linked with the income and has an influence for quite some time. Di Tella et al, (2003) explained that macroeconomic factors have a quite strong effect on happiness which is the exactly opposite what he concluded that it might be that some macroeconomic factors have more influence on quality of life than others.

I assume that this part will be assessed based on the following factors. I found many research papers that confirmed that Foreign Direct Investments are boosting economy growth, hence have a

positive effect on quality of life, and unemployment and another example. The higher the rate of unemployment the lower quality of life in a certain state.

Also, very important goal for happiness and welfare studies is to evaluate the influence of tax policies, since it is a part population's income (Di Tella and MacCulloch, 2006). His research question was: What is the change in life quality or welfare in case where the tax on cigarettes is raised? Another reason to study the relevance of life quality on behalf of economists is to assess the effect of institutional conditions (quality of governance and the size of social capital) on individual well-being (Frey & Stutzer, 2002). Still, the most important factor out of all, is dealing with unemployment rate. Of Unemployment has such a large influence on the well-being of human beings that it causes a serious decline in happiness. Especially, when economy collapses, and has a big recessionary gap, unemployment is a serious economic problem influencing individual happiness.

Inkeles (1960) concluded, that people with good education, training requiring jobs and good economic situations more often call themselves happy. However, the opposite argument is not true, people with a lower status, didn't describe themselves as less happy in research of 15 different countries.

Cantril (1965) concludes about five-stage scheme of Rostow's, stages of growth (Rostow, 1959). He relates the well-being of inhabitant of a country to the economic development stage of that country (measured by real GNP). However, since cultures are very different and the components of development are not included, African countries with a low GNP may be developed in a different way than South American countries with a low GNP. It is hard to develop only on the GNP. Therefore, this is not a perfect relation for our study, I will not use it further on.

Oswald (1997) reports that economic growth has an influence on a very small part of people and increases the level of wellbeing. Yet, Inkeles (1960) concluded that people who either used to work or work on higher positions are happier than people who work on low positions. Note, that countries with large differences between the rich and poor (developing countries) are no less happy than countries where wealth is distributed more equally (developed countries).

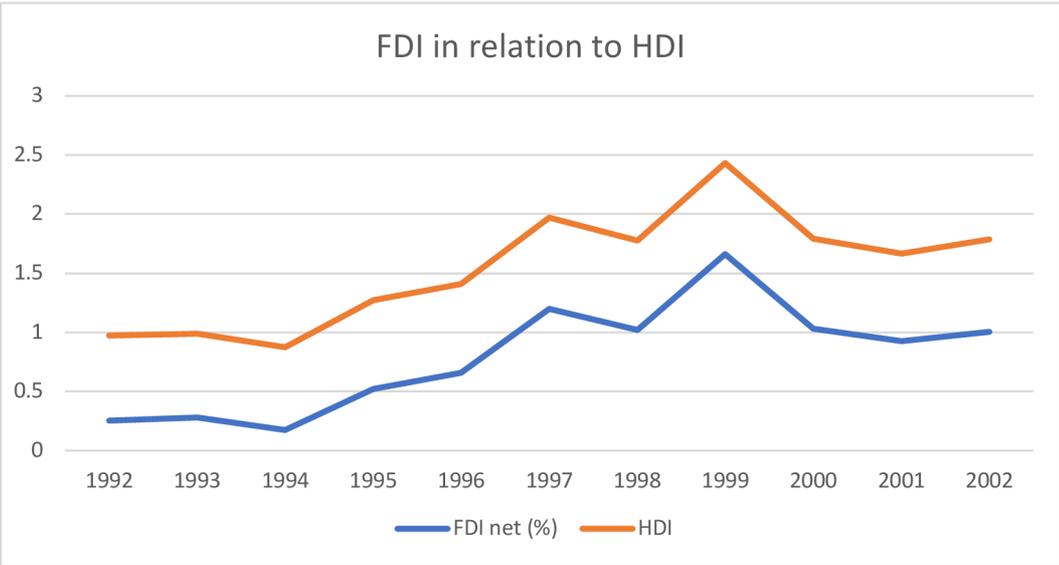
Easterlin (1995) claimed that raising income for all will not increase the happiness of all. Which means that all people of an economically rich country are happier. The reason is that people feel much happier when they receive more income monthly, rather than their neighbor's. However, when people start receiving the same amount of income, people do not feel better. Dilip (2006) cluded that, the

GDP per capita doesn't relate to the happiness of people. Probably, it would do so, if the income rises, compared to someone else's. When people see equal circumstances within their economic possibilities, this doesn't influence their happiness level. He also did a quantitative research, which was based on a Q&A section, measuring the level of happiness of people. The results were absolutely unexpected. Since the economic factors are affecting the quality of life in either developing or developed countries.

3.3.1 Foreign Direct Investments in relation to HDI

I agree with Borensztein (1998) who concluded that Foreign Direct Investments have a massive impact on economic development and eventually have an economic and social impact on quality of life in the hosted country. Borensztein (1998) demonstrated an influence of Foreign Direct Investments and HDI in Latin America.

Graph 1: FDI in relation to HDI in Latina America



Source: Borensztein (1998, page 66).

Another empirical evidence was noticed in Africa. 2 academic papers, where all of the concluded that FDI had a massive influence in reduction of poverty level in Africa. (Gohou & Soumare, 2012) Tsaurai (2018), And as the reader can see, all of them were done in different timing, using different samples, econometric techniques, and even different index measures. But all in all, they found positive relation between FDI and poverty reduction in the sense that FDI. Concerning the

endogenous variables used for poverty reduction measure, we noticed that apart from Gohou and Soumare (2012), who used HDI as the endogenous variable in their research.

Another research was done by Magombeyi and Odhiambo (2017) in opposite found mixed evidence in their research in south Africa, while using three different indicators of poverty namely household consumption expenditures, infant mortality rate and life expectancy.

Agarwal and Atri (2015) assessed the impact of foreign direct investment on poverty reduction in India over the period 1980–2011. Their results using generalized least squares (GLS) showed that foreign direct investment inflows have a negative impact on poverty reduction. The authors also expanded their analysis in the region to compare India's performance with other countries in the SAARC (South Asia Association for Regional Cooperation) region. The results differ in the sense that foreign direct investment flows to other countries in the region reduce poverty.

3.3.3 Unemployment rate in relation to quality of life

World Economic Forum (2014) warned that youth unemployment is one of the biggest problems and major threats for any country. Experts warned that youth unemployment can lead to the extremism, outbreaks of social unrest and destroy the hope of sustainable economic growth. Unemployment is not only responsible for economical backdown, but it also evolves stress, health problems, insecurity problems and so on. It is tightly linked with the feeling aspects. It also undermines the social aspects of life, such as high criminality, suicidal tendencies and suicide were even found among unemployed youth.

Bruce (1997) examined the following relation, by stating the following hypothesis, where gender had a significance effect on the quality of life but also unemployment level had a significant impact of quality of life in general. His total sample was numbered for 200 observers, divided in two groups. He used the Quality-of-Life Scale (QOLS) where he constructed the following model. HDI was dependent variable and had relations with Gender Index and Unemployment rate between youth.

3.3 Relation between happiness to HDI

Happiness and HDI are quite closely linked with each other. As discussed before, the HDI measures the overall performance of a country whereas, happiness measures how positive people feel. As mentioned in a research question, how does happiness link with HDI? Since yes, HDI is considered to have all the necessary variables that show the outcome and results, but happiness is still something more than just a number. How does that link with HDI, let's figure this out?

Blanchflower and Oswald (2005) argued a research on the paradox of the connection between HDI and happiness. The question they had, whether in true the countries that are ranked as high in the Human Development Index, are also ranked high in the happiness index.

Firstly, I plan to compare data of Republic of Kazakhstan. The comparison will be based on HDI and happiness in different forms and after try to reach a conclusion on the link between welfare and happiness based on the literature research and questionnaires.

Doing the test for the upcoming chapter, I had defined three main aspects. First, I have the HDI index, this simply contains the index from the objective UN HDI index and is thus a given index. Secondly, the WVS the Average report on happiness, where I had to analyze subjective answers to those questions (example: "How happy are you with your health?"). And lastly, HDI predicted is a combination of a weighted average of the three components of the HDI index – health, education, and GDP index. Where combination, or weight of each component is based on the weight from each related component in the subjective average reported index of happiness.

In order to start-off with a comparison and analyzation of data, we would have to evaluate the data of HDI for Republic of Kazakhstan. In order to do that, I use the following data provided by UNDP (2020). There are lists of excel files, from which I extracted the data.

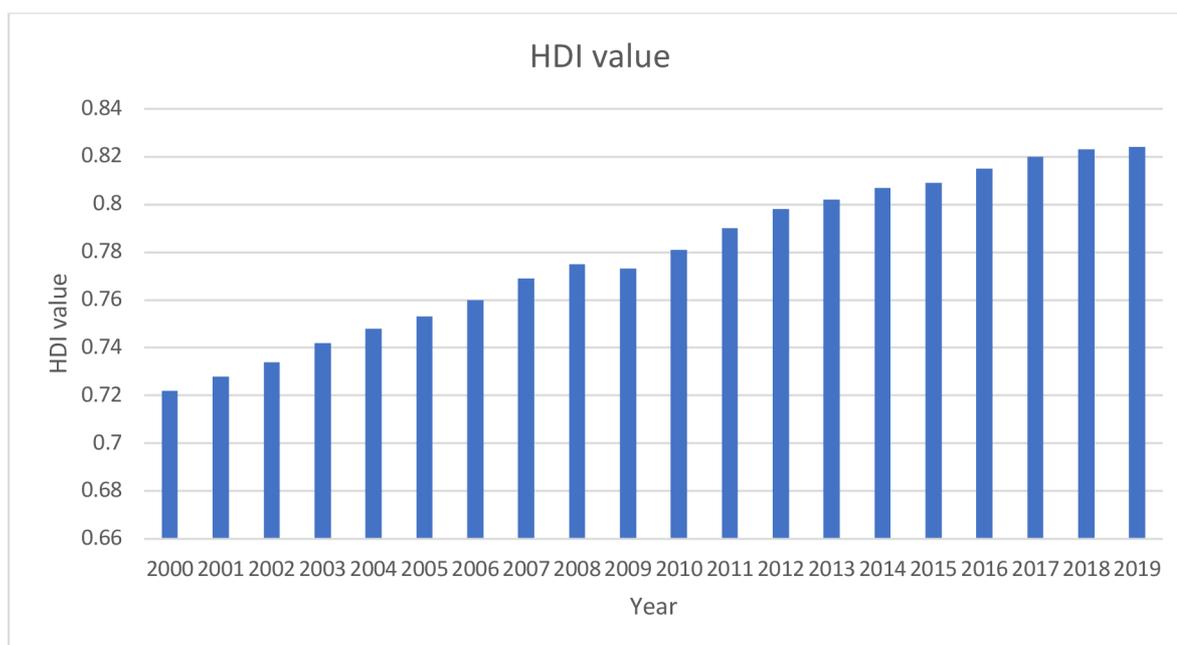
4 Practical part

I plan to describe the macroeconomic variables and demonstrate its development in relation to Kazakhstan Republic at the beginning.

4.1 HDI in relation to Republic of Kazakhstan

Kazakhstan's HDI value for 2019 is 0.825. (See Appendix 1). Which puts the country among the highly developed categories, positioning it at 51st place out of 189 countries. Between 1990 and 2019, Kazakhstan's HDI value has been increasing, from 0.690 up to 0.825, which recorded an increase of 19.6 percent. According to (UNDP,2020) data, Kazakhstan's progress of life expectancy at birth increased by 6.8 years, mean years of schooling increased by 3.8 years, expected years of schooling increased by 3.2 years. Kazakhstan's GNI per capita increased by about 66.3 percent within 29 years.

Graph 2: HDI Trends, 1990-2019.

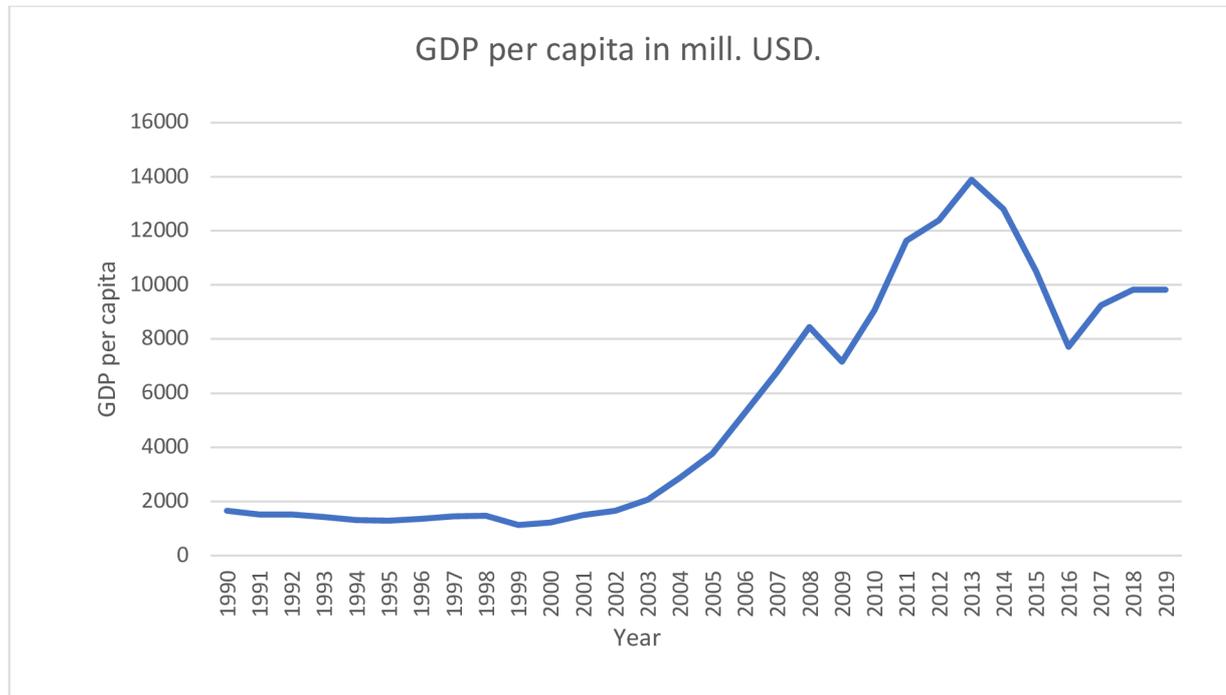


Source: Data from UNDP (2020), own processing in Excel

HDI rank	Year	1990	2000	2010	2014	2015	2017	2018	2019
51	Kazakhstan	0,69	0,685	0,764	0,798	0,806	0,815	0,819	0,825

Source: Own processing in Excel SW.

Graph 3: GDP per capita, 1990-2019.



Source: WorldBank,2020. Own processing in Excel.

Since independence in 1991, Kazakhstan has experienced remarkable economic performance. Rapid growth, fueled by structural reforms, abundant hydrocarbon resources, strong domestic demand, and foreign direct investment (FDI), has helped reduce poverty and transform the country into an upper-middle-income economy. Due to investments of such companies as: Chevron, Eni, BP, Gazprom in 1993, and the rest of the major oil companies, who are the main players on the market, Kazakh's economy has been ramping up from 1993, even nowadays, the economy of Kazakhstan is getting certainly better. However, I can see a decrease of GDP in 2009, due to the financial crisis, which had severe consequences on economic growth, globally. Kazakhstan in that case has lost lots of potential and I took almost 2 – 2,5 years in order to get back on track. On the graph we can see the consequence of the global crisis between 2008 and 2009, however after the crisis it took only 2 years to gain the same economic power as previously. The Kazakh economy is very vulnerable on the relationships among CIS countries; hence it has a negative effect on population. The peak was at 2013 by the end of the December which was the highest out of all. However, due to devaluation of Kazakh currency in February of 2014, Kazakhstanis had experienced a heavy economic burden with the devaluation of its currency. Banks such as (atf24, HalykBank went bankrupt) due to high amount of given loans, people were not able to pay its liabilities back. As a result, private sectors had experienced a lack of financial support. Initially, it had a negative effect on overall performance of HDI. The

economy still tries to recover from its slump. So far, the economy is being stable, hence the HDI becomes stable relatively.

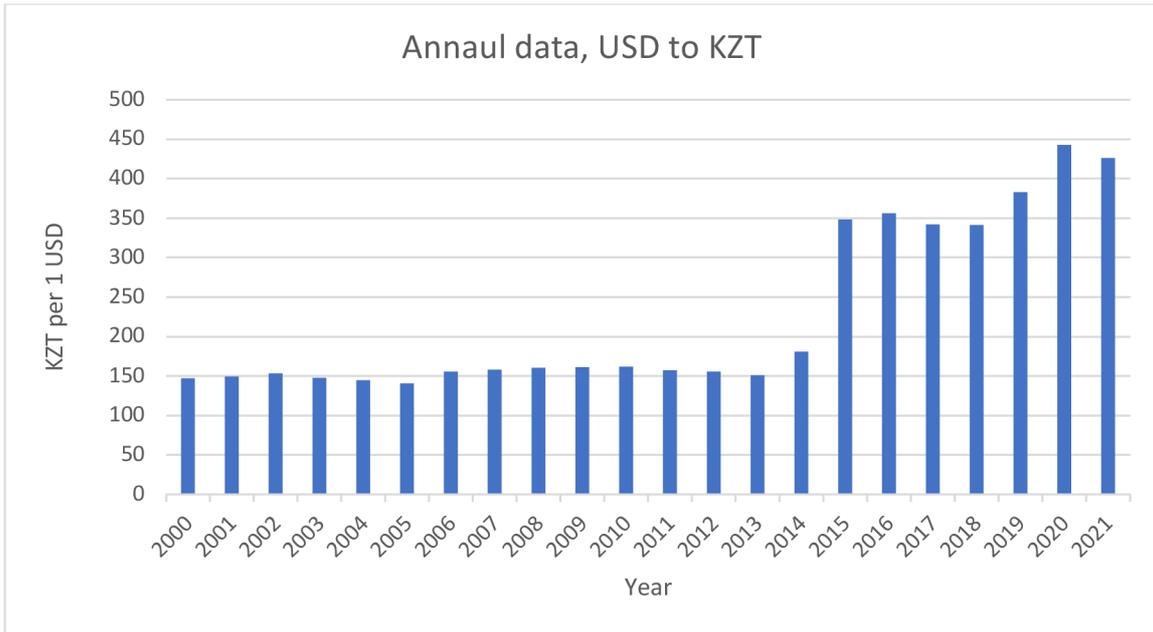
Income

Average salary in Kazakhstan has been changing over the years, for the past 10 years however, according to the HalykBank exchange rates from 1990 to 2019, the salary has been slightly decreasing in relation to USD currency, but generally was increasing in national currency KZT, which says a lot about the devaluation of the national currency. See Graph 4.

The development of income in Kazakhstan has been progressing very slowly for the past 5 years. As a result of inflation and unemployment, I can see the following consequences numbered below. However, Kazakh government announces the necessity of financial institutions to help and stabilize the low and middle class, still within this monetary field the state is not able to control the situation fully. Yet, it is seen a slight stagnation of economy of Republic of Kazakhstan.

Even GDP per capita has decreased over the years as a result of devaluation of Tenge in the year of 2014, 14 of February. That day, the devaluation level was above 53 %. However, it positively affected the nation in general. It was predicted by banks and officials, and population started to take loans and convert it into USD or EUR currency to exchange it later on and have a profit, however it didn't have a lasting effect. The bank experienced a heavy burden and some of the banks such as ATF and Eurasia Bank went bankrupt. It is very important to state that, after 2014, we can see a big decrease of currency exchange as an impact of devaluation on its currency. However, the main consequence was the CPI percentage change. People didn't expect the raise of prices that fast, prices went dramatically on top, which eventually had a massive negative impact on purchasing behavior and I may assume on human satisfaction level as well. (See Table 1, Average Income).

Graph 4: Exchange rate of USD to KZT



Source: World Bank (2022)

Table 1: Kazakhstan’s HDI Trends of consistent time series data

Year	HDI	GDP per capita	Average Income (USD)	Life expectancy at birth
2010	0,76	9070	527	68,45
2011	0,77	11634	597	68,69
2012	0,74	12387	612	69,52
2013	0,79	13891	680	70,62
2014	0,798	12807	675	71,44
2015	0,806	10511	568	71,97
2016	0,809	7715	501	72,41
2017	0,815	9248	463	72,95
2018	0,819	9813	472	73,15
2019	0,825	9813	485	73,18

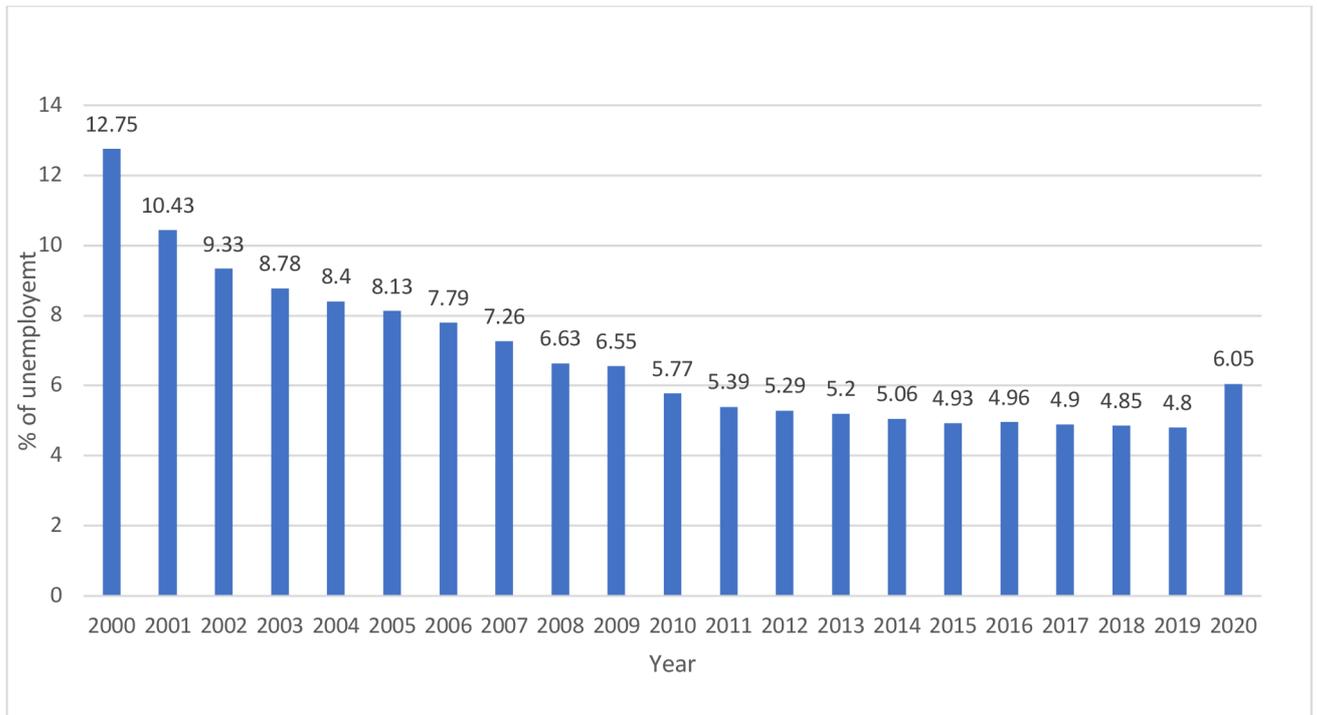
Source: World bank (2020) & StatGov.kz (2020) & UNDP (2020)

Unemployment

When Kazakhstan announced its independence, it was very hard to get back on track with the current situation and tackle the unemployment. But Kazakhstan managed to get over it for the 7 years. Starting of 2000, Kazakhstan quickly managed to attract Foreign Direct Investors and deal with unemployment with the help of diversified economy. However, the percentage still was high in 2000, ranking almost 12,3 percentage. A lot of people had difficulties and had to take big loans to get by. Financial and social institution cooperated to help its people out for the period of 5 years. Loans at that time were with a low interest rates which significantly helped the nation to overcome hard times. After the global crisis of 2008, the unemployment rate however was stable within 3 years. Main reasons of unemployment in Republic of Kazakhstan, as I assume, are the following:

- Lack of jobs
- Lack of constructive relations
- Lack of experience
- Lack of necessary qualification
- Lack of desire work
- Lack of state support
- Low salary
- Disinterest of employers
- Competition on the labor market

Graph 5: Unemployment rate in %



Source: Based on the World Bank, own processing in Excel SW.

The Human Development Index is very sensitive to the macro-economic indicator of unemployment. I might assume that people who lack the job or not able to find a job are the ones whose affects impact negatively on overall performance of HDI. In my opinion the recent situation with the Covid-19 has brought a lot of unemployment consequences and it is seen on the graph, since the pandemic has started in China, it has increased the unemployment rate in the Republic of Kazakhstan. For the years of 2019 to 2020, the unemployment rate has increased by 1,205 %, which in total gives us over 200.000 thousands of unemployed people for the year of 2020.

An overall unemployment rate has been stable between 2011 up to 2019, between 4 up to 5,29 percent. I assume that with the high level of unemployment the country might experience a huge decrease in HDI index since it is directly correlate with each other. As a result, people who are unemployed have tendencies to commit crimes and disorder the social life of the citizens. Hence it has a massive impact on the overall Human Development Index. When talking about the unemployment rate, the first comes to mind is the human capital of a nation and how well it is developed. The unemployment rate might seem high hence it is linked with the educational sub-indicator of HDI. According to the statement of N.A. Nazarbayev (2018) noted that the huge personal

reserve of the country's economy is the self-employed population. He captured that "Human Capital" is the basis of Modernization, according to the plan of 2050.

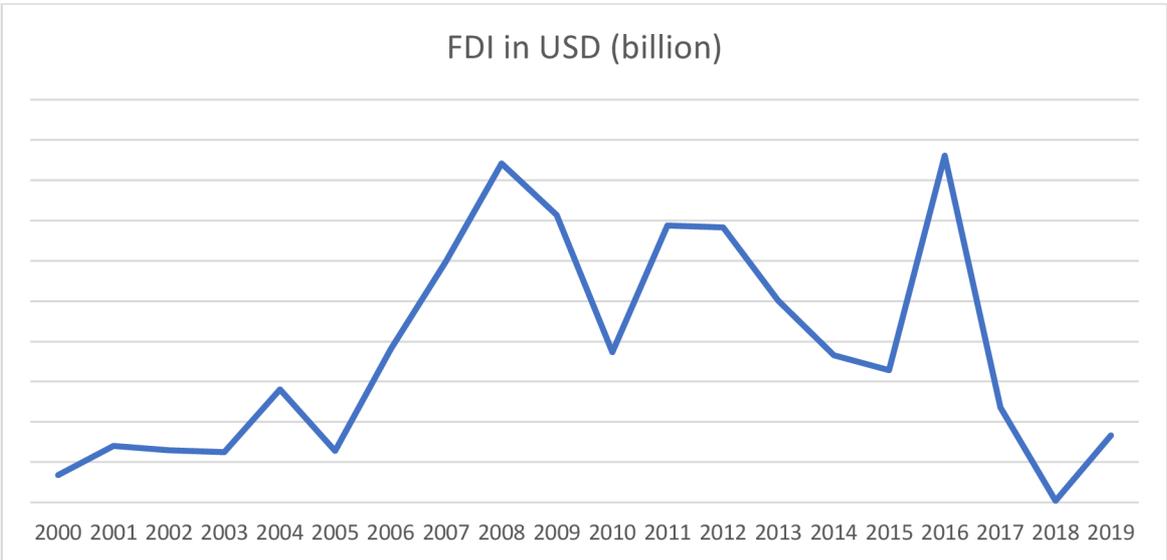
FDI

Foreign direct investments play an insane role in the development of a nation. It provides job positions for the people hence give monetary opportunity for Kazakhs to access a stable welfare. The main interests of the foreign direct investors are the natural wealth of Kazakhstan such as oil & gas industry. The other investment core is the transitional road thru the Asia Pacific countries, Kazakhstan's location plays a major role in the transactions and logistics of goods and services between Europe and China mainly. Foreign Direct Investments is a relevant macro indicator that help government to decrease unemployment rate and stabilize economy at different stages.

I assume this macroeconomy indicator has an impact on overall quality of life of Kazakh nation. With the inflow of FDI, there are job-positions that are very well-paid, however from the perspective of investors, there are certain criteria that they look for in the selection process of human capital, thus the educational level, which is again, a part of the Human Development Index, is very relevant sub-indicator to consider. Human Capital is a necessity for investors to prioritize. However, starting of 2000, the economy was making its progress, the government of Kazakhstan and its officials together with Nursultan Nazarbayev had to make decisions and change policy framework for FDI's to settle within the territory of Kazakh Republic. Again, as it has been mentioned before, the crisis of 2008 (See Graph 5, has demonstrated its effect on Kazakh economy). Many investors left the country because of the financial instability on the global market. As a result, HDI of 2007-2008 and 2009 was at the same level, the financial burden was too heavy to handle and almost took 4 years to recover.

Companies such as Chevron, BP, Eni which are involved in crude oil extraction, provide job positions mostly for men. Which I might assume, positively affects the development of population. The other companies such as Banking sector, Audit and Assurance Services, such as (Bank of America, Netland BK, KMPG, pwc and extra) are also the ones who provide jobs positions for both, women, and men. Again, the educational aspect considering Foreign Direct Investments, should be on point, so the companies do not struggle with allocation of resources.

Graph 6: Foreign Direct Investment Inflows (Millions USD)

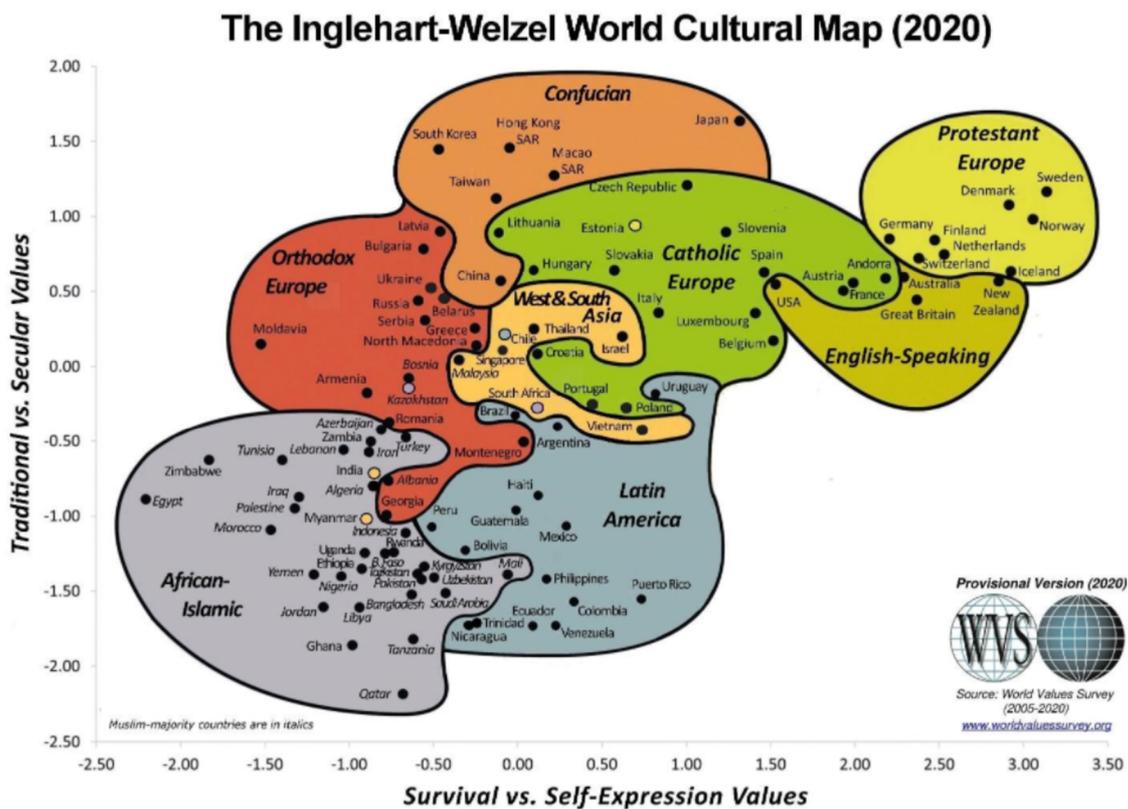


Source: World bank, own processing in Excel SW.

4.2 World Value Survey in relation to Republic of Kazakhstan

The WVS (World Value Survey) is an institution which helps to explore people’s values and believes. Kazakhstan has only participated in two waves of the survey so far, in 2011 and 2018. According to the data of WVS (2018), it mostly remained in the same position, without much change. WVS (2020) even though, Kazakhstan is situated on the left quarter (See Figure 3), following the common correlation observed on the map, it is still associated with a poorer and less developed countries. Since Kazakhstan is situated on the upper part of the quarter, it is considered to belong to the “Orthodox Europe” sector of the map values. This ranking highly demonstrates the results of two waves of survey, it is closer to the countries of Eater Europe, in terms of their believes and values of the population. By looking at this map, the closest neighbors of Kazakhstan are Romania, Bosnia, and Armenia. The difference however, according to (WVS, 2020) had an economic, political, and social reasons and demographical situation, at obvious. Kazakhstan possesses vast stocks of natural resources, yet the economy of Romania is leading in terms of GDP per capita (World Bank, 2019).

Figure 3: The global cultural map



Source: World Value Survey (2020).

4.3 Data and Analysis

One of the objectives of this research is to investigate the relationship between the Human Development Index and Macroeconomic indicators such as Foreign Direct Investments inflow, Unemployment rate and Average Income in USD. The research is based on the secondary research and literature review.

I use an annual data from 2000 up to 2019, which includes 20 years of observation. After a comprehensive review of a various data, I will not include the sub-indicators of HDI into the model, because all of them are already in every annual data is included. I couldn't find the data of FDI inflows for Kazakhstan, so I reduced my sample size by 1 year. The data showed above for Unemployment rate and Human Development Index are till 2020.

The author applied quantitative research using a secondary data. All data are processed in Excel Software. The data retrieved from a database of World Bank and NatzBank and UNDP, which means that I can certainly rely on that data.

I run the MLRM, which is shown below.

Economic model: $y_{1t} = B_0 - B_{1x1t} - B_{2x2t} + B_{3x3t} + TV + U_t$.

Where:

Y_{1t} – Human Development Index

B_0 – Constanta.

X_1 – Unemployment rate in (%)

X_2 – Foreign Direct Investments (USD)

X_3 – Average Income (USD)

U_t – Random Error Term, (residual error).

TV – Time Vector

T – time series (19 years)

Figure 4: Multiple Linear Regression Model

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,755	0,026	28,801	0,000	0,699	0,811	0,699	0,811
Unemployment rate	-0,006	0,002	-2,452	0,027	-0,010	-0,001	-0,010	-0,001
FDI in USD (billion)	0,000	0,000	-0,516	0,613	0,000	0,000	0,000	0,000
Average Income (USD)	0,000	0,000	0,049	0,962	0,000	0,000	0,000	0,000
Time Vector	0,005	0,001	6,732	0,000	0,003	0,006	0,003	0,006

Source: Own Processing in Excel SW.

Based on the model output of the model the average income demonstrates its insignificance to the model at 0,05 alfa, which means that the model should be rerun without Average Income (USD).

Figure 5: Multiple Linear Regression Model – 2

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,7557	0,0215	35,0827	0,0000	0,7100	0,8013	0,7100	0,8013
Unemployment rate	-0,0056	0,0019	-2,9071	0,0103	-0,0097	-0,0015	-0,0097	-0,0015
FDI in USD (billion)	0,0000	0,0000	-0,6101	0,5503	0,0000	0,0000	0,0000	0,0000
Time Vector	0,0048	0,0007	7,1713	0,0000	0,0034	0,0063	0,0034	0,0063

Source: Own Processing in Excel SW.

The model without Average Income (USD) was run, however again the FDI in USD (billion) demonstrates in insignificance at 0,05 % alfa, which means that the model should be re-run without FDI in USD variable.

Figure 6: Multiple Linear Regression Model – 3

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,748	0,017	44,980	0,000	0,712	0,783	0,712	0,783
Unemployment rate	-0,005	0,002	-3,174	0,006	-0,008	-0,002	-0,008	-0,002
Time Vector	0,005	0,001	8,595	0,000	0,004	0,006	0,004	0,006

Source: Own Processing in Excel SW.

Now, the model is left with only one variable of Unemployment Rate which shows a significance of that particular variable, and a time vector shows a linear increase in time, hence, the final model is the following:

Figure 7: Summary output of the model.

SUMMARY OUTPUT	
<i>Regression Statistics</i>	
Multiple R	0,99
R Square	0,98
Adjusted R Square	0,98
Standard Error	0,01
Observations	20,00

Source: Own Processing in Excel SW.

$$y_t = 0,7475 - 0,00495x_{1t} + 0,005T.$$

Figure 8: ANOVA

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2,000	0,031	0,015	449,040	0,00
Residual	17,000	0,001	0,000		
Total	19,000	0,031			

Source: Own Processing in Excel SW.

Based on the Significance of F, which equals to 1,9333E-15 at Alfa level of 0,05.

I reject the null hypothesis of being.

H0: $B_{nxn} =$ The Model is not statistically significant.

H1: $B_{nxn} \neq$ The Model is statistically significant.

I reject the H0, meaning that the model is significant.

Figure 9: Model Verification

Variable	Alfa	Sign	P - value	Accept/Reject	Significant/Insignificant
x1	0,05	<	0,005	Reject	Significant
TV	0,05	<	0,005	Reject	Significant

Source: Own Processing in Excel SW.

Based on the p – value of the Unemployment Rate Variable, the H0 is rejected, meaning there is a significance of x1 and thus it contributes to the model with the HDI as being dependent variable.

Figure 10: Autocorrelation

In order to detect the autocorrelation, I use Durbin-Watson Test.

<i>DW Numerator</i>	<i>DW denominator</i>
	1,90824E-05
2,38255E-06	3,49504E-05
1,2292E-05	5,78832E-06
1,79204E-05	3,33922E-06
1,66155E-05	3,48521E-05
1,31165E-05	9,07301E-05
7,53833E-08	9,60359E-05
1,34512E-05	3,7604E-05
6,66418E-05	4,12591E-06
2,06265E-06	1,20231E-05
4,771E-05	0,000107634
1,15824E-06	8,64613E-05
1,9933E-05	2,33658E-05
5,64635E-05	7,18454E-06
0,000357473	2,84222E-09
5,36328E-06	5,11919E-06
1,23045E-06	1,13692E-05
5,46166E-06	1,07081E-06
1,65749E-06	6,38242E-08
5,0775E-07	2,11537E-07
0,000641516	0,000581014
DW Test	1,104132174

Source: Own processing in Excel SW.

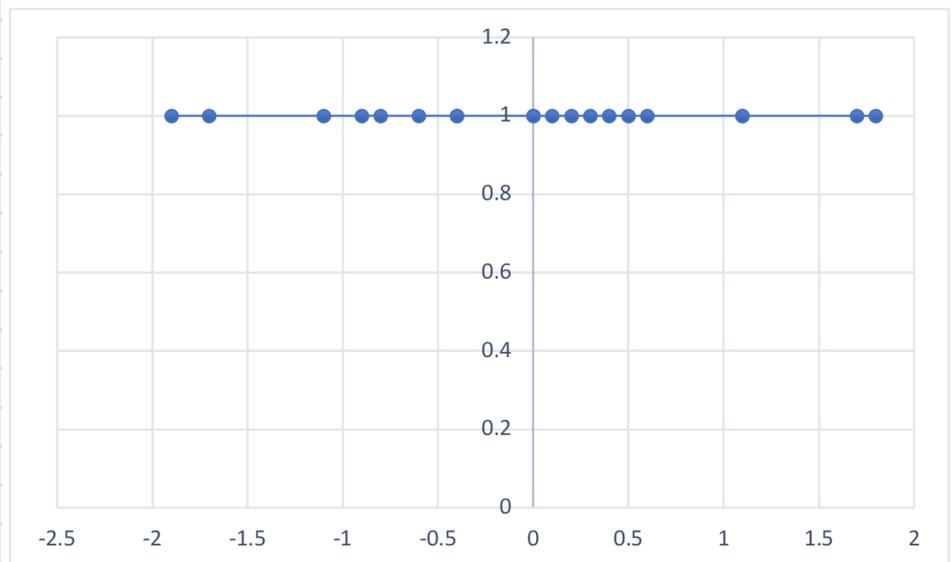
Based on the result of $DW = 0,000641516/0,000581014 = 1,104132$

Indicating, the positive correlation of variable Unemployment Rate to HDI. Durbin-Watson tests the autocorrelation of residuals, and they might be independent. Unfortunately, a positive correlation was found – but the result (test value) is very close to finding NO autocorrelation which is required. Therefore, I would conclude that the test results are not far from finding no correlation, and that the autocorrelation of residuals got better after including the time vector.

Figure 11: Normality

Based on the residual plot of each variable, the residuals seem to be normally distributed, however there is a skewed graph on the right, at the interception of 1,5 and 2.

<i>Rounded and Sorted St.Residuals</i>	<i>Sorted</i>
-0,8	-1,9
-1,1	-1,7
-0,4	-1,1
0,3	-0,9
1,1	-0,8
1,7	-0,6
1,8	-0,4
1,1	-0,4
-0,4	0
-0,6	0
-1,9	0,1
-1,7	0,2
-0,9	0,3
0,5	0,4
0	0,5
0,4	0,6
0,6	1,1
0,2	1,1
0	1,7
0,1	1,8



Source: Own processing in Excel SW.

Skewed = 0,00145

Even though it is skewed, the author can conclude that the residuals are normally distributed, because the level of skewness is less than 1 or -1.

5 Conclusion

Based on the results of MRLM, that was run in Excel Software, I can conclude that not all variables are significant to the HDI, within a timeframe of 20 years, from 2000 to 2019.

Even though, the outcome of the model showed an insignificance of two variables such as “Average Income in USD” and “Foreign Direct Investments in USD” The indicators that were chosen are mostly related to the monetary matter.

Therefore, my model has the same results and similar conclusion such as Bruce (1997) that unemployment rate negatively impacts the quality of life, however he relates the indicator to HDI, and the same conclusion was achieved. Additionally, I stated in my hypothesis that it will negatively impact the Human Development Index, the hypothesis was verified with the model.

Interestingly enough when Time Vector is added, the Foreign Direct Investments becomes insignificant, which controversy the study of Borensztein (1998) who explained that foreign direct investments have a positive impact on social and economic aspects in Latin America.

The Average Income turned out to be also insignificant, as it doesn't contribute to the HDI, however I might argue that statement, in my opinion, the more you earn the happier you are, however there is a saying “Money doesn't define happiness” which might be true in reality.

However, in my opinion, the World Value Survey, could be added in the further researchers, because it touches on human's feeling and how he/she feels in general, within his/her country.

The HDI is a good indicator which measures mostly the monetary aspects of life of a human-being and that is where they differ with World Value Survey.

All the planned procedures were done. The only one hypothesis has been confirmed by the model that the unemployment rate will negatively impact the Human Development Index. The rest of the hypothesis were not verified.

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Dataset:

Kazakhstan					
Year	HDI	Unemployment rate	FDI in USD (billion)	Average Income (USD)	Time Vector
2000	0,685	12,75	1370521199	103,6231884	1
2001	0,7	10,43	2816823050	122	2
2002	0,714	9,33	2588491060	137	3
2003	0,726	8,78	2483253230	240	4
2004	0,737	8,4	5615262947	267	5
2005	0,747	8,13	2546065710	313	6
2006	0,754	7,79	7611168450	369	7
2007	0,758	7,26	11972842989	398	8
2008	0,758	6,63	16818890680	459	9
2009	0,762	6,55	14275888207	411	10
2010	0,764	5,77	7456117901	527	11
2011	0,772	5,39	13760291529	562	12
2012	0,782	5,29	13648134374	600	13
2013	0,795	5,2	10011293285	643	14
2014	0,798	5,06	7308112644	675	15
2015	0,806	4,93	6577824050	568	16
2016	0,812	4,96	17220962548	675	17
2017	0,815	4,9	4712631471	463	18
2018	0,819	4,85	83409074,56	472	19
2019	0,825	4,8	3320645021	485	20
Source	UNDP	WorldBank	WorldBank	NatzBank.kz	

Appendix 1:

	Very high human development	Human Development Index (HDI) for 2019	Life expectancy at birth for 2019	Mean years of schooling	(GNI) per capita
1	Norway	0,957	82,4	12,9	66 494
2	Ireland	0,955	82,3	12,7	68 371
2	Switzerland	0,955	83,8	13,4	69 394
4	Hong Kong, China (SAR)	0,949	84,9	12,3	62 985
4	Iceland	0,949	83,0	12,8	54 682
6	Germany	0,947	81,3	14,2	55 314
7	Sweden	0,945	82,8	12,5	54 508
8	Australia	0,944	83,4	12,7	48 085
8	Netherlands	0,944	82,3	12,4	57 707
10	Denmark	0,940	80,9	12,6	58 662
11	Finland	0,938	81,9	12,8	48 511
11	Singapore	0,938	83,6	11,6	88 155
13	United Kingdom	0,932	81,3	13,2	46 071
14	Belgium	0,931	81,6	12,1	52 085
14	New Zealand	0,931	82,3	12,8	40 799
16	Canada	0,929	82,4	13,4	48 527
17	United States	0,926	78,9	13,4	63 826
18	Austria	0,922	81,5	12,5	56 197
19	Israel	0,919	83,0	13,0	40 187
19	Japan	0,919	84,6	12,9	42 932
19	Liechtenstein	0,919	80,7	12,5	131 032
22	Slovenia	0,917	81,3	12,7	38 080
23	Korea (Republic of)	0,916	83,0	12,2	43 044
23	Luxembourg	0,916	82,3	12,3	72 712
25	Spain	0,904	83,6	10,3	40 975
26	France	0,901	82,7	11,5	47 173
27	Czechia	0,900	79,4	12,7	38 109
28	Malta	0,895	82,5	11,3	39 555
29	Estonia	0,892	78,8	13,1	36 019
29	Italy	0,892	83,5	10,4	42 776
31	United Arab Emirates	0,890	78,0	12,1	67 462
32	Greece	0,888	82,2	10,6	30 155
33	Cyprus	0,887	81,0	12,2	38 207
34	Lithuania	0,882	75,9	13,1	35 799

35	Poland	0,880	78,7	12,5	31 623
36	Andorra	0,868	81,9	10,5	56 000
37	Latvia	0,866	75,3	13,0	30 282
38	Portugal	0,864	82,1	9,3	33 967
39	Slovakia	0,860	77,5	12,7	32 113
40	Hungary	0,854	76,9	12,0	31 329
40	Saudi Arabia	0,854	75,1	10,2	47 495
42	Bahrain	0,852	77,3	9,5	42 522
43	Chile	0,851	80,2	10,6	23 261
43	Croatia	0,851	78,5	11,4	28 070
45	Qatar	0,848	80,2	9,7	92 418
46	Argentina	0,845	76,7	10,9	21 190
47	Brunei Darussalam	0,838	75,9	9,1	63 965
48	Montenegro	0,829	76,9	11,6	21 399
49	Romania	0,828	76,1	11,1	29 497
50	Palau	0,826	73,9	12,5	19 317
51	Kazakhstan	0,825	73,6	11,9	22 857
52	Russian Federation	0,824	72,6	12,2	26 157
53	Belarus	0,823	74,8	12,3	18 546
54	Turkey	0,820	77,7	8,1	27 701
55	Uruguay	0,817	77,9	8,9	20 064
56	Bulgaria	0,816	75,1	11,4	23 325
57	Panama	0,815	78,5	10,2	29 558
58	Bahamas	0,814	73,9	11,4	33 747
58	Barbados	0,814	79,2	10,6	14 936
60	Oman	0,813	77,9	9,7	25 944
61	Georgia	0,812	73,8	13,1	14 429
62	Costa Rica	0,810	80,3	8,7	18 486
62	Malaysia	0,810	76,2	10,4	27 534
64	Kuwait	0,806	75,5	7,3	58 590
64	Serbia	0,806	76,0	11,2	17 192
66	Mauritius	0,804	75,0	9,5	25 266
	High human development				
67	Seychelles	0,796	73,4	10,0	26 903
67	Trinidad and Tobago	0,796	73,5	11,0	26 231
69	Albania	0,795	78,6	10,1	13 998
70	Cuba	0,783	78,8	11,8	8 621
70	Iran (Islamic Republic of)	0,783	76,7	10,3	12 447
72	Sri Lanka	0,782	77,0	10,6	12 707
73	Bosnia and Herzegovina	0,780	77,4	9,8	14 872
74	Grenada	0,779	72,4	9,0	15 641

74	Mexico	0,779	75,1	8,8	19 160
74	Saint Kitts and Nevis	0,779	74,8	8,7	25 038
74	Ukraine	0,779	72,1	11,4	13 216
78	Antigua and Barbuda	0,778	77,0	9,3	20 895
79	Peru	0,777	76,7	9,7	12 252
79	Thailand	0,777	77,2	7,9	17 781
81	Armenia	0,776	75,1	11,3	13 894
82	North Macedonia	0,774	75,8	9,8	15 865
83	Colombia	0,767	77,3	8,5	14 257
84	Brazil	0,765	75,9	8,0	14 263
85	China	0,761	76,9	8,1	16 057
86	Ecuador	0,759	77,0	8,9	11 044
86	Saint Lucia	0,759	76,2	8,5	14 616
88	Azerbaijan	0,756	73,0	10,6	13 784
88	Dominican Republic	0,756	74,1	8,1	17 591
90	Moldova (Republic of)	0,750	71,9	11,7	13 664
91	Algeria	0,748	76,9	8,0	11 174
92	Lebanon	0,744	78,9	8,7	14 655
93	Fiji	0,743	67,4	10,9	13 009
94	Dominica	0,742	78,2	8,1	11 884
95	Maldives	0,740	78,9	7,0	17 417
95	Tunisia	0,740	76,7	7,2	10 414
97	Saint Vincent and the Grenadines	0,738	72,5	8,8	12 378
97	Suriname	0,738	71,7	9,3	14 324
99	Mongolia	0,737	69,9	10,3	10 839
100	Botswana	0,735	69,6	9,6	16 437
101	Jamaica	0,734	74,5	9,7	9 319
102	Jordan	0,729	74,5	10,5	9 858
103	Paraguay	0,728	74,3	8,5	12 224
104	Tonga	0,725	70,9	11,2	6 365
105	Libya	0,724	72,9	7,6	15 688
106	Uzbekistan	0,720	71,7	11,8	7 142
107	Bolivia (Plurinational State of Bolivia)	0,718	71,5	9,0	8 554
107	Indonesia	0,718	71,7	8,2	11 459
107	Philippines	0,718	71,2	9,4	9 778
110	Belize	0,716	74,6	9,9	6 382
111	Samoa	0,715	73,3	10,8	6 309
111	Turkmenistan	0,715	68,2	10,3	14 909
113	Venezuela (Bolivarian Republic of)	0,711	72,1	10,3	7 045
114	South Africa	0,709	64,1	10,2	12 129
115	Palestine, State of	0,708	74,1	9,2	6 417

116	Egypt	0,707	72,0	7,4	11 466
117	Marshall Islands	0,704	74,1	10,9	5 039
117	Viet Nam	0,704	75,4	8,3	7 433
119	Gabon	0,703	66,5	8,7	13 930
	Medium human development				
120	Kyrgyzstan	0,697	71,5	11,1	4 864
121	Morocco	0,686	76,7	5,6	7 368
122	Guyana	0,682	69,9	8,5	9 455
123	Iraq	0,674	70,6	7,3	10 801
124	El Salvador	0,673	73,3	6,9	8 359
125	Tajikistan	0,668	71,1	10,7	3 954
126	Cabo Verde	0,665	73,0	6,3	7 019
127	Guatemala	0,663	74,3	6,6	8 494
128	Nicaragua	0,660	74,5	6,9	5 284
129	Bhutan	0,654	71,8	4,1	10 746
130	Namibia	0,646	63,7	7,0	9 357
131	India	0,645	69,7	6,5	6 681
132	Honduras	0,634	75,3	6,6	5 308
133	Bangladesh	0,632	72,6	6,2	4 976
134	Kiribati	0,630	68,4	8,0	4 260
135	Sao Tome and Principe	0,625	70,4	6,4	3 952
136	Micronesia (Federated States of)	0,620	67,9	7,8	3 983
137	Lao People's Democratic Republic	0,613	67,9	5,3	7 413
138	Eswatini (Kingdom of)	0,611	60,2	6,9	7 919
138	Ghana	0,611	64,1	7,3	5 269
140	Vanuatu	0,609	70,5	7,1	3 105
141	Timor-Leste	0,606	69,5	4,8	4 440
142	Nepal	0,602	70,8	5,0	3 457
143	Kenya	0,601	66,7	6,6	4 244
144	Cambodia	0,594	69,8	5,0	4 246
145	Equatorial Guinea	0,592	58,7	5,9	13 944
146	Zambia	0,584	63,9	7,2	3 326
147	Myanmar	0,583	67,1	5,0	4 961
148	Angola	0,581	61,2	5,2	6 104
149	Congo	0,574	64,6	6,5	2 879
150	Zimbabwe	0,571	61,5	8,5	2 666
151	Solomon Islands	0,567	73,0	5,7	2 253
151	Syrian Arab Republic	0,567	72,7	5,1	3 613
153	Cameroon	0,563	59,3	6,3	3 581
154	Pakistan	0,557	67,3	5,2	5 005

155	Papua New Guinea	0,555	64,5	4,7	4 301
156	Comoros	0,554	64,3	5,1	3 099
	Low human development				
157	Mauritania	0,546	64,9	4,7	5 135
158	Benin	0,545	61,8	3,8	3 254
159	Uganda	0,544	63,4	6,2	2 123
160	Rwanda	0,543	69,0	4,4	2 155
161	Nigeria	0,539	54,7	6,7	4 910
162	Côte d'Ivoire	0,538	57,8	5,3	5 069
163	Tanzania (United Republic of)	0,529	65,5	6,1	2 600
164	Madagascar	0,528	67,0	6,1	1 596
165	Lesotho	0,527	54,3	6,5	3 151
166	Djibouti	0,524	67,1	4,1	5 689
167	Togo	0,515	61,0	4,9	1 602
168	Senegal	0,512	67,9	3,2	3 309
169	Afghanistan	0,511	64,8	3,9	2 229
170	Haiti	0,510	64,0	5,6	1 709
170	Sudan	0,510	65,3	3,8	3 829
172	Gambia	0,496	62,1	3,9	2 168
173	Ethiopia	0,485	66,6	2,9	2 207
174	Malawi	0,483	64,3	4,7	1 035
175	Congo (Democratic Republic of the)	0,480	60,7	6,8	1 063
175	Guinea-Bissau	0,480	58,3	3,6	1 996
175	Liberia	0,480	64,1	4,8	1 258
178	Guinea	0,477	61,6	2,8	2 405
179	Yemen	0,470	66,1	3,2	1 594
180	Eritrea	0,459	66,3	3,9	2 793
181	Mozambique	0,456	60,9	3,5	1 250
182	Burkina Faso	0,452	61,6	1,6	2 133
182	Sierra Leone	0,452	54,7	3,7	1 668
184	Mali	0,434	59,3	2,4	2 269
185	Burundi	0,433	61,6	3,3	754
185	South Sudan	0,433	57,9	4,8	2 003
187	Chad	0,398	54,2	2,5	1 555
188	Central African Republic	0,397	53,3	4,3	993
189	Niger	0,394	62,4	2,1	1 201