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A New Approach to Human Capital: Crime Adjusted Human Capital Index on European Countries

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Abstract

Human capital is a one of the essential components in the economic growth and development. Also, the belief that education and health level, which are the main components of human capital, are main features of a happy and healthy society, is getting stronger. But there is a fact that crime is a destructive notion that affects a society's human capital. In this context, this study aims to create an alternative social welfare measurement method that includes crime rates as a component to human capital on 35 European countries. In this regard, first, a general crime index was generated by using 13 different crime categories of the 35 European countries, and then this index was adapted to the Human Capital Index. As a result, the Crime-Adjusted Human Capital Index (CAHCI) was obtained. It was observed that the country rankings we obtained based on the CAHCI differ significantly from the rankings made based on the Human Capital Index. Significant number of countries, which ranks high in the Human Capital Index, ranks lower when crime rates are considered, indicates that the reliability of social welfare measures based on human capital should be questioned.

Key words: Human Capital, Crime, Crime-Adjusted Human Capital Index

JEL Code: J24, K42, O15

1. Introduction

Making definition of and measuring a healthy and happy society is a challenging task. The reason of it is that the level of social welfare is not only

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affected by economic factors but also by many social, psychological, and environmental factors. Many measurement methods have been developed with economic and non-economic components that are thought to represent social welfare. The increasing importance of the phenomenon of human capital in modern growth and development theories, especially in endogenous growth models, has caused various indices that measure the same phenomenon to be considered as an indicator of social welfare. Among them, the Human Capital Index (HCI) developed by the World Bank is one of the most prominent and highly respected indicators in the scientific community in recent years. The human capital phenomenon, which is thought to represent social welfare of a country and the measurement of this phenomenon, is largely based on the education and health sectors, which are positively related to GDP, and are assumed to be important representatives of the quality of life. New Growth Theories see human capital as one of the main engines of growth and explain the development differences between countries with the development in the education and health sectors. As a country gets stronger in health and education, the amount of human capital of that country also increases.

An individual's education level, professional knowledge and skills, health status, socio-cultural class, and even personality are elements of human capital. In this regard, human capital is a concept whose different components can be prioritised according to the fields in which researchers work, and for this reason, a complete consensus has not been reached on its definition.

Different approaches are used in measuring the human capital level of a country. The World Bank, which has developed one of these approaches, calculates HCI every year within the scope of the "Human Capital Project". The World Bank focuses on three basic components related to human capital in the calculation of HCI. These are survival, education, and health (Kraay, 2018:3). It is very important to determine the power of HCI, which is built on these components, to represent a healthy, happy, peaceful, and developed society. It is a contentious issue whether high income level, healthy and long lifespan, and high schooling rates will be the guarantee of welfare and happiness in the social dimension. It is expected that the number of healthy and happy individuals and the welfare level of the society will increase in with a development process focused on human capital.

The key element here is how to define a healthy society. One of the most important elements of a healthy society is that people living in this society feel safe. There are many researchers, with Erich Fromm (1955) being in the lead, who draw attention to the fact that the indispensable building blocks of a healthy society are trust, solidarity, and love. The sum of these relations, values, and norms, which have important in the emergence of a healthy and satisfied society, lead us to the concept of social capital. In this sense, one of the most important factors that damages balanced social relations and social peace and thus damage social capital is crimes committed in society. High crime rates are among the indicators of social unrest and poor health. The effect of human capital level which increases with high

schooling rate, physically healthy long life and high income on crime rates in the society comes to the fore as a problem that needs to be questioned.

In this context, in our study, the Crime-Adjusted Human Capital Index (CR-HCI) was calculated to understand the relationship between human capital and crime rates. The aim desired to be achieved when making this calculation is to reveal the real welfare and happiness levels of the countries, which are ranked based on the human capital scores determined by the education and health components, with a more comprehensive approach. Thus, it will be tried to reach clues regarding what can be done to increase the happiness level of a society whose physical needs are met and whose income and education level is high.

The rest of the study has represented an order as follows. The second section briefly presents background information about the concept of human capital and human capital index. The third section explains the theoretical and empirical literature. The fourth section reviews the data and methodology used. In the last section, results and conclusions are represented.

2. Theoretical and Empirical Literature Review

One of the leading economists who deal with the issue of human capital is Adam Smith. Smith states that the skills and abilities of the people living in a country should be included in the capital accumulation of that nation. The reason for it is that individual skills and abilities increase the welfare level of the society as well as the one of individuals. Smith remarks that the individuals in society will take their place in the human capital stock for the wealth and welfare of the society and the country after they bear the cost of acquiring such skills and abilities (UNECE, 2016; 8). The tendency to feature human capital as a source of economic growth has increasingly continued in the 1960s, especially under the leadership of Becker (1968), Schultz (1961), and Mincer (1962). Famous sociologist J. Coleman (1988) expressed that just as physical capital is created by changes in materials to form tools that facilitate production, human capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways. Human capital is defined as the aggregation of investments in such areas as education, health, on-the-job-training, and migration that enhance an individual's productivity in the labour market, and also in non-market activities (Sharpe, 2001:3). Human capital has different aspects from physical capital. Laroche, Merette, and Ruggeri (1999) express in their studies that there are five different aspects of human capital that differ from other types of capital and that should be particularly emphasised. First, human capital is a commodity that can be embodied in human beings and cannot be traded, although the services produced by human capital can be marketed. Second, individuals, especially young people, do not always control decisions related to how they can build human capital. Especially in the early years of life, human capital decisions are made by parents, teachers, government, and society, not by the real owners of human capital. Third, human capital has a qualitative as well as a quantitative aspect to reflect the quality of educational inputs. Fourth, human capital may be general or may belong to a firm

or sector. Finally, human capital creates individual or social externalities (Laroche, Merette, & Ruggeri, 1999:89).

In this sense, there are three basic components used by the World Bank in human capital index calculations today. These components are as follows (Worldbank, 2021: 23):

1. Survival Component: Probability of surviving of children born to age of 5.
2. Education Component: The education component in the human capital index deals with education from two different aspects as quantitative and qualitative. Quantitatively, the number of school years a child can expect to achieve by age 18 is measured. In the qualitative context, the Learning Adjusted Years of School (LAYS) component is handled and the scores of the tests applied to international students are included in the index in a harmonious manner.
3. Health Component: There are 2 dimensions in the health component in the human capital index. One of them is the rate of children who do not suffer from stunting due to nutritional deficiency and the other is the rate of survival of adults.

As a result of using these calculation components, values ranging from 0 to 1 are calculated for each country. If the index value of the countries approaches 1, it can be interpreted that the human capital stock of that country improves and if it approaches 0, the human capital stock of that country deteriorates.

Human Capital, Social Welfare, and Crime

The expected result of a strong human capital stock is the health, welfare, happiness, and peace of the society. As a matter of fact, as expressed by Coleman (1988), social capital in both the family and society plays an active role in the creation of human capital for future generations. Again, according to Coleman, if the gains of human capital can be completed with the components of social capital representing social relations, it can become effective (Coleman, 1988:109). Regarding to this view, the place of crime in the components of social capital gains importance. According to Robison et al. (2002) a richer paradigm emerges as scientists and practitioners from different disciplines share their understanding of social capital. The growing benefit of the social capital paradigm is exemplified by its applications in various fields such as education, healthcare, crime reduction, investment in public goods, customer retention, advertising, community development, economic growth, and poverty reduction (Robison et al., 2002:4). In this case, it is observed that one of the basic social capital elements necessary to ensure social peace is low crime rates. When the studies of Robison and Coleman are considered together, the benefits of high human capital stock can only be realized in the presence of low crime rates.

In a general definition, crime is the general name given to acts that violate a law and can be punished by an authority with official sanctions. Since ancient civilizations, various mechanisms have been tried to prevent crime in order to ensure the peace and welfare of societies. While trying to prevent crime, the most important step in this matter is to find out what the motivation for committing a crime is and to try to prevent it. According to Emile Durkheim, crime is all kinds of life-threatening attacks directed towards the values of social life and the crime is inevitable. In this context, it is not possible to imagine a society without crime (Durkheim, 1938). Before 1968, while criminals were viewed as deviant individuals with atypical motivations, crime theory is now largely based on empirical studies by sociologists, psychologists, criminologists, political scientists, and law professors with the developments in the field (Enthorf et al., 2000: 75).

It is accepted that the crime rates in a country are an important indicator of the welfare of the society and the quality of life of the people. While public authorities are trying to develop policies to direct social resources to education and health investments, which are the basic components of human capital, in order to ensure social welfare and sustainable growth, on the other hand, they strive to fight crime and use substantial public resources. That is because when crime rates increase, distrust prevails in society and individuals do not feel safe. Crime is a very crucial factor that threatens public health and trust, which is the most essential need of people, disrupts its socio-psychological structure, and has a devastating effect on social integrity (Canter and Youngs, 2016: 286). Feelings of fear increase in societies with high crime rates and this is reflected in people's daily activities. While crimes cause loss of life and property on the one hand, they also cause physical pain, trauma, anxiety, and stress, and the feeling of "vulnerability" caused by crimes disrupts individual and social peace.

One of the important components of the Better Life Index developed by the OECD, therefore, consists of data on "personal safety". Likewise, among the Quality-of-Life Indicators published by the European Union Statistical Office (Eurostat), physical safety is included as a component, considering that violence and crime reduce the quality of life and increase feelings of insecurity and anxiety. The studies of Cummins (2012), Franc et al., (2012), Graham and Chaparro (2012), and Roberts (2012) provide important evidence of the relationship between a country's social welfare and safety. Meanwhile, it should be noted that besides the easily identifiable tangible and monetary costs of crime, there are also costs that cannot be determined precisely. The decrease in social welfare and quality of life is one of the most important of these costs. There are other studies assumes that crime rates in a society decrease with education, high schooling rate, high income, and wage, increase in employment opportunities, low poverty rates, and equality in income distribution (Ehrlich, 1973; Lochner, 1999; Lochner et al., 2004; Kelly, 2000; Cerro and Meloni, 2000; Bhorat et al., 2017; Entorf and Spengler, 2000; Tsushima, 1996; Buonanno et al., 2014, Tunca, 2019).

While contemporary economists, like endogenous growth theorists, emphasize the role that education plays in reducing crime, they argue that externalities provided by education at microeconomic and macroeconomic levels

can reduce crime rates. Lochner and Moretti (2004) state that education creates three external effects on committing a crime. The first of these effects is that the social return of education is much higher than the private return, thus creating a positive externality. The second effect is the material externality. Accordingly, human capital investments increase legal work, so that individuals become more productive, and their wages increase according to the level of education and qualification they receive. The third external effect of education on crime is that the education process can diffuse income inequalities into social cohesion. The education process helps strengthening the communication between income groups in the presence of income inequalities. In this case, the education process acts as a public policy that tries to prevent crime (Mokline, 2018: 132-133).

Besides all, as Becker points out, although an individual's decision whether to commit a crime is related to the monetary reward, the probability of being caught, and the severity of the penalty, the decision to commit a crime is a personal decision. A Human Capital Index created according to this personal decision will better emphasize the qualitative aspect of human capital, as Laroche, Merette, and Ruggeri (1999) stated in their study.

There are various studies in the literature on the relationship between human capital and crime. Most of these studies focused on the relationship between education and crime, which is one of the most important elements of human capital. But education level is only one of the factors assumed to be effective in crime rates. There are many empirical studies that question the relationship between income, age, unemployment rate, inflation, income inequality, poverty, demographic factors, divorce, and immigration rates and crime rates.

Alzer and Doyle (2015) argue in their study that the net gain of a criminal act is a function of the monetary reward, the probability of being caught, and the severity of the punishment. They also indicate in their study that the net gain from participating in law-abiding industries is also largely a function of wages determined by one's human capital. In this context, it is seen that there is a relationship between human capital and crime.

Mokline (2018) examined the determinants of committing crime on a sample of 51 American States during the period (2000-2013) in his study. As a result, it was found that investment in human capital has a negative effect on crime rates in general. This effect is more apparent on crime against property. It shows that a deterrent policy against crime can be implemented through the implementation of structures that can increase public expenditure on education.

3. Methodology and Findings

The CAHCI (Crime-Adjusted Human Capital Index) presented in this study represents a new interpretation of the human capital index adapted to the crime factor. While creating the index, CRI (Crime Index) was generated with 13 different crime type statistics determined based on the international crime classification created for statistical purposes, and then this index was multiplied by the human capital index to arrive at CAHCI, a new interpretation of the human capital index.

Calculating the CRI

First, 13 different index values were created for each country with the help of data on 13 different crime types for 2018 obtained from the Eurostat database for 35 European countries. To obtain index value for each 13 different types of crime, the equation has used as follows:

$$CRI_{\ i} = \frac{(maximum\ value_i - observed\ value_i)}{(maximum\ value_i - minimum\ value_i)}$$

The *i* in the formula represents 13 different types of crime. Here, while the maximum value is the highest value observed in the countries subject to the study between 2008-2018, when the data were published by Eurostat, the minimum value was accepted as 0. The maximum values observed in the relevant period, together with the observation years and countries, are as shown in Table 1. After the indices for 13 different crime types were determined for each 35 countries with the above equation, the arithmetic average of the 13 indices was taken to reach the overall CRI.

Table 1. Maximum Values of 13 Different Types of Crime

	Crime Classification	**Country**	**Year**	**Value***
1	Intentional homicide	Lithuania	2008	8.90
2	Attempted intentional homicide	Holland	2011	23.76
3	Assault	Scotland	2008	1540.54
4	Kidnapping	Luxembourg	2012	10.86
5	Sexual violence	England and Wales	2018	274.81
6	Rape	England and Wales	2018	99.48
7	Sexual assault	Sweden	2017	115.11
8	Robbery	Belgium	2011	248.54
9	Burglary	Denmark	2009	1940.90
10	Burglary of private residential premises	Denmark	2009	1213.49
11	Theft	Denmark	2009	5452.55

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12	Theft of a motorised land vehicle	Czechia	2009	657.17
13	Unlawful acts involving controlled drugs or precursors	Switzerland	2013	1210.20

*Per hundred thousand inhabitants

Source: Eurostat,https://ec.europa.eu/eurostat/cache/metadata/en/crim_off_cat_esms.htm Access Date: 10.03.2021

The "observed value" data of each country was taken for the year of 2018. In countries where there is no 2018 data on any type of crime, the last value announced was used in the calculations in order to avoid data loss and to include as many observations as possible in the analysis. However, in case that there is no data on any crime type in the entire period when the data set is announced for any country, the index for the relevant crime type of the relevant country was not generated, and the average of the other indices was taken. Having a value between 0 and 1, a CRI close to 1 indicates low crime rates, and close to 0 indicates high crime rates.

Crime-Adjusted Human Capital Index (CAHCI)

After determining the overall CRI value for each country for the year of 2018, this value was multiplied by the 2018 HCI value and the Crime-Adjusted Human Capital Index (CAHCI) value was obtained. CRI and CAHCI scores are listed in Table 2.

Table 2. CRI and CAHCI Scores

	HCI		**CRI**		**CAHCI**		**HCI → CAHCI**	
	Country*	**Score**	**Country**	**Score**	**Country**	**Score**	**-%**	**Ranking**
1	Ireland	0.81	Albania	0.95	Czechia	0.73	5.70	+7
2	Finland	0.81	Poland	0.94	Slovenia	0.73	7.37	+5
3	Holland	0.80	Slovakia	0.94	Serbia	0.71	6.28	+14
4	Sweden	0.80	Czechia	0.94	Poland	0.71	5.13	+16
5	Germany	0.79	Bulgaria	0.94	Cyprus	0.70	6.24	+14
6	Austria	0.79	Croatia	0.94	Estonia	0.68	9.16	+12
7	Slovenia	0.79	Montenegro	0.93	Croatia	0.67	5.86	+16
8	Czechia	0.78	Cyprus	0.93	Portugal	0.67	13.46	+1
9	Portugal	0.78	Serbia	0.93	Ireland	0.66	17.59	-8

10	United Kingdom**	0.78	Romania	0.93	Italy	0.66	13.56	+2
11	Denmark	0.77	Hungary	0.93	Austria	0.66	15.88	-5
12	Italy	0.77	Slovenia	0.92	Lithuania	0.65	7.48	+13
13	Norway	0.77	Lithuania	0.92	Slovakia	0.65	5.15	+16
14	Switzerland	0.77	Estonia	0.90	Hungary	0.65	6.82	+12
15	Belgium	0.76	Greece	0.89	Spain	0.65	12.02	+6
16	France	0.76	Malta	0.89	Finland	0.64	20.41	-14
17	Serbia	0.76	Kosovo	0.89	Bulgaria	0.64	5.84	+13
18	Estonia	0.75	Latvia	0.88	Holland	0.63	20.07	-15
19	Cyprus	0.75	Spain	0.87	Latvia	0.63	11.85	+5
20	Poland	0.75	Portugal	0.86	Switzerland	0.63	17.61	-6
21	Spain	0.74	Italy	0.86	Germany	0.63	19.83	-16
22	Iceland	0.74	Austria	0.84	Malta	0.62	10.27	+5
23	Croatia	0.72	Ireland	0.82	Greece	0.61	10.16	+8
24	Latvia	0.72	Switzerland	0.82	Norway	0.59	22.39	-11
25	Lithuania	0.71	Germany	0.80	Albania	0.59	4.57	+8
26	Hungary	0.70	Holland	0.79	Montenegro	0.58	6.12	+6
27	Malta	0.70	Finland	0.79	Iceland	0.57	22.37	-5
28	Luxembourg	0.69	Iceland	0.77	Romania	0.55	6.72	+6
29	Slovakia	0.69	Norway	0.77	Denmark	0.53	30.93	-18
30	Bulgaria	0.68	Luxembourg	0.71	France	0.51	32.63	-14
31	Greece	0.68	Denmark	0.69	Kosovo	0.50	10.55	+4
32	Montenegro	0.62	France	0.67	Luxembourg	0.49	28.22	-4

33	Albania	0.62	Belgium	0.61	United Kingdom	0.47	39.16	-23
34	Romania	0.60	United Kingdom	0.60	Belgium	0.47	38.10	-19
35	Kosovo	0.56	Sweden	0.51	Sweden	0.41	48.08	-31

*Turkey, Bosnia and Herzegovina and North Macedonia, which do not have sufficient data on the relevant crime types, and Liechtenstein, whose 2018 HCI score is not disclosed, are not included in the analysis.
**Crime data is announced by Eurostat separately for Scotland, N. Ireland, England and Wales, while the HCI score is published as the United Kingdom. Therefore, the CRI value of the United Kingdom was obtained by taking the arithmetic average of the CRI scores calculated for each of the relevant countries, and this value was multiplied with the HCI value of the United Kingdom to get the CAHCI value.

Source: Authors' Calculations

Table 2 shows the changing rankings of the countries and the percentage changes in the index scores after the relevant adjustments, along with the CRI and CAHCI scores. Here, a decrease will be seen in the adjusted index value of each country because the CRI score is below 1. Therefore, it should be emphasised that the percentage changes in the table are toward decreasing.

As it was mentioned before, the CRI value ranged from 0 to 1, while a value close to 1 indicates that crime rates decrease, and closer to 0 indicates that crime rates increase. For this reason, the high percentage decrease in going from HCI to CAHCI will be interpreted as a negative indicator for the relevant country. The findings obtained in the study show that the rankings made based on CAHCI and the rankings based on HCI differ significantly, and the countries that are at the top in the HCI rankings descend to the lower ranks. In the ranking based on CAHCI, it is observed that Sweden dropped 31, United Kingdom 23, Belgium 19, Denmark 18, Germany 16, France and Finland 14 and Norway 11 places compared to the ranking based on HCI. On the other hand, it is seen that the ranking of countries such as Poland, Slovakia, Croatia, Serbia, Lithuania, Hungary, and Estonia, which have very low CRI scores among the countries subject to the study, have changed positively and significantly. In our opinion, it causes a re-examination of the human capital representation capabilities of the education and health components used in the measurement of human capital.

The results, which indicate that in some countries with high HCI scores, the tendency to crime is quite high, on the other hand, in some countries with low HCI scores, the crime rates are extremely low, supports the necessity of discussion on this issue. It is required to seek an answer to whether the Human Capital Index (HCI), one of the most used measurements of human capital, is a sufficient indicator of social welfare and happiness.

Besides the ability of human capital to represent a country's social welfare, the adequacy of measurement methodologies should also be questioned. For example, the education component in the HCI index roughly covers the time spent in education and school and does not reflect family, social environment, gender differences in education, regional differences, and different types of education with different content and quality. However, the education and behaviour patterns that an individual receives in their families are of great importance in committing a crime. On the other hand, the circle of friends and social environment with which individuals communicate can also have a lasting effect on behaviours. Another factor neglected when calculating HCI is the health component. While the health component used in calculating the HCI does not cover the general psychology of the society, individual psychological diseases, loneliness, and similar problems, it also does not measure regional differences and inequalities in health services. Pasquini and Rosati who argue that the human capital index does not contain complete information in terms of education and health components emphasised that the HCI calculated for Italy does not provide reliable information and that the calculation of the index based on regions will better reflect the reality due to different development levels (Pasquini and Rosati, 2020). In this sense, restructuring the health care components of HCI may reduce the uncertainty regarding the future effects of the index (Stein and Sridhar, 2019; 1-3).

On the other hand, compatible with these results, it is necessary to draw attention to the assumptions behind the process of creating the CR-HCI. The perspective of crime in the legal system of each country that is the subject of the study should be examined in order for the studies to be carried out within the framework of this subject to be more enlightening. In short, it should be understood whether there is a standard about whether the actions taken are considered as crimes. Differences between countries in the legal definition of crimes and determination processes can play an active role on official crime rates in countries. In this study, these effects are assumed to be constant, hypothetically. These assumptions are meaningful considering that the countries subject to the study are in a certain geography, most of them are EU countries with a political and economic integration, and therefore the citizens of these countries live in similar socio-economic and legal conditions.

4. Results and Conclusions

In this study, a crime adjusted human capital index (CAHCI) was developed as an alternative to HCI, which also includes the crime factor, since crime is an important indicator of social welfare and quality of life. The significant differences in the country rankings based on HCI and CAHCI require re-examination of the ability of the education and health components used in the measurement of human capital to represent both human capital and social welfare and happiness and provides evidence for the necessity to reconsider the measurement methods of human capital.

A long and qualified education process and a long physically healthy life do not guarantee individuals to have a positive emotional state of mind and low crime rates. Therefore, HCI measurements and country rankings based on HCI are not as close as it is healthy indicators of social welfare and quality of life. The more inadequate the use of GDP alone in measuring the welfare levels of countries, the more inadequate the use of HCI, which has education and health-oriented components, which are seen to be positively related to GDP.

Education and health are among the most important elements of human capital and quality of life. The quality of life is expected to increase when the education and health level of a country increases. However, one of the most important indicators of quality of life is individual safety, which is among the elements of social capital. An increase in crime rates and a decrease in the level of individual safety in a society will reduce the quality of life in that society.

In general, there is an expectation of a decrease in crime rates as the level of education increases. However, the empirical literature on this subject does not strongly confirm the predicted negative relationship between education levels and crime rates. Here, it should be considered that the education process of children and young people include not only the school but also the family and social environment. No matter how high quality the education service offered in schools is, the importance of family and social environment is extremely high in acquiring positive behaviours that children and young people will exhibit throughout their lives. In addition, the health aspect, which is the second most important component of human capital, measures only physical health and does not carry information regarding the mental health of individuals. The HCI index, which is built on the physical growth levels of children and the survival times of children and adults, is far from carrying sufficient information for the mental health and peace of the society. In this study, the new rankings which we generated based on CR-HCI obtained by including crime rates in HCI provide evidence for it. A long and qualified education process and a long physically healthy life do not guarantee individuals to have a positive emotional state of mind and low crime rates. Therefore, HCI measurements and country rankings based on HCI are far from being healthy indicators of social welfare, happiness, and quality of life. The more inadequate the use of GDP in measuring the welfare levels of countries, the more inadequate the use of HCI, which has components that are positively related to GDP.

The findings of the study show that studies on the classification of countries in terms of development and welfare level and quality of life and social happiness will not put forward healthy results in case that they do not include multidimensional variables, especially cultural, sociological, and psychological variables.

REFERENCES

Alzer, A. and Doyle, J. J. (2015). Juvenile incarceration, human capital, and future crime. evidence from randomly assigned judges. *Quarterly Journal of Economics*, *130*, No. 2, pp. 759-803.

Becker, G. (1968). Crime and punishment. An economic approach. *Journal of Political Economy*, *76*, No.2, pp.169-217.

Bhorat, H., Lichtenstein, A., Monnakgotla, J., Thornton, A. and Van Der Zee, K. (2017). The Socio-economic determinants of crime in south africa. An empirical assessment. *Development Policy Research Unit Working Paper*. DPRU, University of Cape Town.

Buonanno, P., Drago, F. and Galbiati, R. (2014). Response of crime to unemployment. An international comparison. *Journal of Contemporary Criminal Justice, 30*, No.1, 29-40.

Canter, D. and Youngs, D. (2016). Crime and society. *Journal of the Academy of Social Sciences, 11*, No.4, pp.283-288. https.//doi.org/10.1080/21582041.2016.1259495

Cerro A. and Meloni, O. (2000). Determinants of the crime rate in Argentina during the 90's, *Estudios de Economía.* 27, No.2, pp. 297-311.

Coleman, J. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94,* pp. 95-120.

Cummins, R. A. (2012). Safety and Subjective Well-Being. A Perspective from the Australian Unity Wellbeing Index, in Subjective Well-Being and Security, Eds. D. Webb and E. Wills-Herrera, *Social Indicators Research Series*, Volume 46, Springer, New York, pp.13-31.

Durkheim, E. (1938). *The rules of sociological* method (8th ed.). Chicago. University of Chicago Press.

Ehrlich, I., (1973). Participation in illegitimate activities; A theoretical and empirical investigation. *Journal of Political Economy*, *81*, No.3, pp. 521-565.

Entorf, H. and Spengler, H. (2000). Socioeconomic and demographic factors of crime in Germany evidence from panel data of the German states, *International Review of Law and Economics, 20*, p. 75–106.

Eurostat, https.//ec.europa.eu/eurostat/cache/metadata/en/crim_off_cat_esms.htm Access Date. 10.03.2021

Franc, R., Prizmic-Larsen, Z. and Lipovčan L. K. (2012). Personal security and fear of crime as predictors of subjective well-being, *Subjective Well-Being and Security*, Eds. D. Webb and E. Wills-Herrera, Social Indicators Research Series, Volume 46, Springer, New York, pp. 45-69.

Freeman, R. B. (1996). Why do so many young American men commit crimes and what might we do about it? *Journal of Economic Perspectives*, *10,* No.1, pp. 25–42.

Fromm, E. (1955). *The sane society*. New York.Open Road Integrated Media.

Graham, C. and Camilo Chaparro, J. (2012). The linkages between ınsecurity, health, and well-being", in Subjective Well-Being and Security, Eds. D. Webb and E. Wills-Herrera, Social Indicators Research Series, Volume 46, Springer, New York, pp.197-253.

Kelly, M. (2000). Inequality and crime, *Review of Economics and Statistics*, *82,* No.4, pp. 530–539.

Kraay, A. (2018). Methodology for a world bank human capital index. *World Bank Policy Research Working Paper 8593*, Development Economics, Development Research Group.

Laroche, M. and Ruggeri G.C. (1999). On the concept and dimension of human capital in a knowledge-based. *Canadian Public Policy*, 25, No.1, pp.87-100.

Lochner, L. (1999). Education, work, and crime. theory and evidence, *Rochester Center for Economic Research Working Paper No. 465*, October, University of Rochester.

Lochner, L. and Moretti, E. (2004). The effect of education on crime. evidence from prison inmates, arrests, and self-reports. *American Economic Review*, 94, No.1, pp. 155-189.

Mincer J. (1962). On the job training costs, returns, and some implications, *Journal of Political Economy*, 70, No. 5, pp.550–79.

Mokline, A. (2018). Criminality, human capital and economic performance, *Business and Economic Research*, *8,* No.4, pp. 130-142. Macrothink Institute.

Pasquini, A. and Rosati, F. C. (2020). A human capital index for the italian provinces, *CEIS Working Paper No. 494.* http.//dx.doi.org/10.2139/ssrn.3629767

Roberts, B. J. (2012). State of affliction. fear of crime and quality of life in south Africa, in *Subjective Well-Being and Security*, Eds. D. Webb and E. Wills-Herrera, Social Indicators Research Series, Volume 46, Springer, New York, pp. 149-177.

Robinson, L. J., Schmid, A. A. and Siles, M. E. (2002). Is social capital capital? *Review of Social Economy*, *60*, pp. 1–24.

Sharpe, A. (2001). The development of indicators for human capital sustainability, *Centre for the Study of Living Standards*, Canadian Economics Association, McGill University, Montreal.

Schultz, T. (1961). Investment in human capital. *AER*, *51*, pp. 1–17.

Stein F. and Sridhar, D. (2019). Back to the future? Health and the world bank's human capital index, *BMJ* 2019;367.l5706. https.//doi.org/10.1136/bmj.l5706

Tsushima, M. (1996). Economic structure and crime. The case of Japan, *Journal of Socio-Economics*, *25,* No.4, pp. 497-515.

Tunca, H. (2019). Socio-economic determinants of crime. Panel data analysis. *Journal of Human and Social Sciences Researches*, 8, No.4, pp.2767-2784.

UNECE (2016), Guide on Measuring Human Capital, United Nations Publications, https.//unece.org/fileadmin/DAM/stats/publications/2016/ECECESSTAT20166_E.pdf

Worldbank (2021). The Human Capital Index 2020 Update. Human Capital in the Time of COVID-19. Washington, DC. World Bank. https.//doi.org/10.1596/978-1-4648-1552-2