Investigation of Human Capital Index Value and Income Distrubution in European and Central Asian Countries: The Case of Turkey

Elif Iliman Püsküllüoğlu* (iD)

Muğla Sıtkı Koçman University, Muğla, Türkiye

Abstract	Article Info
Educational indicators offer a straightforward means of gauging a country's education. Besides, evaluation based on these indicators is of great significance and value. Nonetheless, education does not take place in a vacuum, and thus these indicators are results of the conditions in a country. Particularly, time and money spent on education, the family's share in economic distribution play a role in determining the current state of education. So, this study aims to evaluate the current state of education in Turkey by examining human capital indices and income distribution in countries in the Europe and Central Asia (ECA) region. For this purpose, the study uses data from the World Bank. The results of the study indicate that children born in developed countries can access near 80% of their potential upon reaching their productive age, compared to only 65% in Turkey. Additionally, Turkey has the greatest degree of income inequality, as indicated by its GINI coefficients, among other countries in the ECA region. Moreover, there are vast disparities between the income of the top 20% and the bottom 20% of Turkey's population.	

*Corresponding author
E-mail: elif.iliman@gmail.com

Introduction

Education can address many different issues, such as learning experiences, the curriculum and its content, teaching methods, examination systems, teacher training and employment policies, and educational planning. All these issues influence the phenomenon of education. Moreover, education is related to many disciplines such as sociology, psychology, philosophy, history, law, and economics and interacts with the issues or variables that fall within the scope of these disciplines. In this context, educational indicators offer a straightforward means of gauging a country's education. Therefore, evaluation depending on these indicators is of great significance and value. Nonetheless, education does not take place in a vacuum, and thus these indicators are results of the conditions in a country.

On the other hand, in Development as Freedom (Sen, 2000), freedoms are accepted as the main ingredient of development, both as an ultimate end and as a primary means. This is because without well-functioning social, economic, political, and legal institutions, as well as the benefits of industrialization, technological progress, and social modernization, it is almost impossible to speak of freedoms and development. Moreover, political freedoms, economic and social

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opportunities, and protective security can be recognized as rights and opportunities to improve one's capabilities. For example, political freedom paves the way for economic security, while social opportunities such as school attendance can improve economic participation. In short, the several types of freedom support each other.

First, examining the factors linked to and influencing education, one can gain insight from a broad range of perspectives. Additionally, it is essential to consider other freedoms and opportunities when accurately gauging education in a country. In the light of these forecasts, this research investigates the present situation of education in Turkey, by evaluating the values of the Human Capital Index and the income distribution among European and Central Asian (ECA) countries. This section of the study provides an overview of human capital, critiques of its theory, the Human Capital Index, the association between education and earnings, and the impact of income disparities on human capital. Moreover, related research examines the links between these variables.

Since Adam Smith in the late 18th century, it has been acknowledged that human capital affects workers' wages (Sahota, 1978). However, the "human capital revolution" began in the second half of the twentieth century when the Chicago School paved the way with economists such as Schultz, Mincer, and Friedman (Becker, 1993). Human capital emerges as a result of investments in individual resources that can affect a person's future earnings (Becker, 1962). In a similar vein, human capital investments can encompass all forms of health care which may influence an individual's life expectancy, any kind of educational practices, for example, apprenticeships available from any structured school levels, adult work programs, and migration to capitalize on variations in job openings (Schultz, 1961). Educational investments —

specifically in human capital — are often the most important of the various investments available (Checchi, 2006; Sahota, 1978). The money and time invested in education create human capital instead of physical capital (Psacharopoulus and Patrinos, 2004). In simpler terms, education is a form of investing in a person which produces returns in the form of human capital (Schultz, 1960). Iliman Puskulluoglu and Ekinci (2018) refer to an individual's education and its contribution to economic growth as human capital. Advocates of human capital suggest that educational experience enhances a person's skills, thus resulting in a higher productivity and wages (Tan, 2014). Workers with higher levels of education earn more, and in developing countries, the gap between workers with high and low levels of education is even greater (Becker, 1993). Moreover, research has established that a greater educational level among workers produces not only enhanced quality of workers but also a greater national income (Denison, 1962). Moreover, according to a World Bank report published in 2018, human capital accounts for 64% of national wealth (cited in Patrinos & Angrist, 2018).

Nevertheless, many scholars have criticized the human capital theory from its beginning. For instance, Schultz (1961) highlights its inability to adequately recognize humans as capital, and Mincer (1974) notes the lack of correlation between income and school attendance. Given the country's individual history and institutional systems, formulating predictions pertaining to it may prove to be a challenging task. The same year of school attendance may yield different results because of these peculiarities (Tan, 2014). In addition, human capital explains only a small portion of income inequality. Besides, human capital is hard to define and therefore not measurable. Even it is precisely defined and measured, education accounts for only a small percentage of income

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(Fix, 2018). Conversely, Nussbaum and Sen (1993) suggest that relying
only on basic data or calculations which reveal merely surface-level
information is an inadequate method to gauge the wealth of a nation, as
true valuation of its wealth or quality of life requires an adequate
understanding of its population and their living conditions. Tan (2014)
asked why international organizations still strongly support the concept
of human capital despite its flaws. He argued that they recognize the
issues associated with human capital theory but appreciate the essential
role of uncontrollable variables. Subsequently, they consider all critics of
human capital theory to have merit. Nevertheless, since there is no other
comprehensive theory of income distribution to substitute for human
capital theory, they accept its validity.

Despite criticism of human capital theory, wide recognition of
human capital's individual utility and its ability to contribute to national
income and social welfare has led to increased investment from countries.
Due to the high returns to human capital, numerous studies have
investigated this issue (Barro, 2001; Becker, Murphy, and Tamura, 1990;
Hanushek, 2013; Mincer, 1984). Likewise, the World Bank's Human
Capital Index, established in 2018, aims to predict the future
productiveness of workers by analyzing their accumulation of human
capital (Pennings, 2020). This Index endeavors to expose how existing
health and educational conditions shape workforce productiveness in
future generations (D'Souza et al., 2019). The Human Capital Index
calculates the human capital a newborn would possess when aged 18,
factoring in the health and educational conditions within their country.
This evaluation incorporates data from both healthcare and education
sections. Healthcare parameters considered are the likelihood of survival,
issues which reduce growth and the average life expectancy of adults.

Education includes the number of years a child is likely to attend school and results on international tests (World Bank, 2020). Human Capital Index (ranging from 0 to 1) assumes that an individual has completed their schooling and is in good health. A human capital index of X means that a child born today at age 18 could be at most 100 times as productive as X if he or she had full access to education and health care. This reinforces just how essential human capital investments are to ensure future generations of enhanced productivity (Kraay, 2018).

Furthermore, employees' salaries differ in accordance with their productivity. Several studies (Checchi, 2006; Gumus and Sisman, 2014; Stevens and Weale, 2004) demonstrate that a correlation between higher educational attainment and higher incomes. These significative factors make income distribution an issue since Ricardo's age, which was during the Classical Economics Era. Functional income distribution, the concept linking income to payments to the factors of production in classical economics, is a major focus of income distribution research (Atkinson, 1997). However, current research takes into consideration the individual income distribution that correlates to the entire population's income accumulated within a certain period (Oz, 2019). Acknowledging the evolving nature of human capital is necessary to properly understand the various explanations for income distribution, which include talent, fate, personal decisions, educational discrepancies, inheritance, life cycle, public funds, and redistribution (Sahota, 1978). One can examine the organic link between human capital and income distribution by looking at these circumstances.

Furthermore, education, a crucial component of human capital, is a service from which all individuals should benefit equally. Nevertheless, not everyone benefits equally, due to factors such as intelligence or skills

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related to coming from a better family, as well as the economic situation of the family, which is also related to financial markets (Checchi, 2006). No matter the origin, variations in income can have a direct effect on the allocation of resources towards human capital. Because of socioeconomic disparities, human capital is not equitably dispersed, making it tough to acquire financing and invest in human capital. Therefore, the inability to make investments in human capital today will affect the amount of human capital available to future generations.

Nevertheless, Welch (1975) encourages the use of human capital theory as an analytical tool to understand intricate matters but cautions against worshipping it as a religion or placing it on a pedestal. Education and human capital are intricately connected because education equips people with the appropriate aptitudes and talents to engage in economic activities. Those with higher levels of education have improved health, a reduced risk of unemployment, heightened engagement in social and political life (Stiglitz, Sen, & Fitoussi, 2009a; 2009b). Education and skill demonstrate a direct correlation, with increased educational attainment leading to a higher social position (Rodríguez-Pose & Tselios, 2009). Despite the interconnections between education, the Human Capital Index, and income distribution, the relationship between them is complex. Although they are all related, the literature reveals indirect correlations or linkages in pairs. The research below investigates them further.

First, recent research has examined the values of the Human Capital Index of different countries. Emirkadi (2020) investigated Turkey's development journey and its performance in terms of human capital. Moreover, Friderichs et al. (2021) calculated a socioeconomically segregated Human Capital Index for South Africa. Lastly, Lim et al. (2018)

measured the human capital of 195 countries and territories for the years between 1990 and 2016.

Second, research also presents studies on income distribution. Karaman and Ozcalik (2007), for example, explored the inequality of income distribution in Turkey and the resulting child labor. On the other hand, Moyo et al. (2022) studied the development of human capital, poverty, and income disparity in the Eastern Cape province. Oz (2019) employed the Gini coefficient and the P80/20 ratio to display income inequality in Turkey. Moreover, Topuz and Sekmen (2020) analyzed the factors that determine income inequality throughout several regions in Turkey. Lastly, Uyanik and Yesilkaya (2021) explored the links between education levels of women, job opportunities, and income inequity.

Third, this paper investigates the indirect relationships between education, income inequality, human capital, and economic growth. To gain insight into the connection between education and income disparity, Coady and Dizioli (2018) and Rodríguez-Pose and Tselios (2009) have conducted research. Campbell and Ungor (2020), Castelló-Climent and Doménech (2021), and Lee and Lee (2018) further explored the bond between human capital and income inequality. Suhendra et al. (2020) investigated the impacts of human capital, income disparity and economic aspects in Indonesia over a period of six years (2013-2019). Gennaioli et al. (2013) scrutinized the correlation between human capital and regional development, while Vaitkevičius et al. (2015) evaluated the typology of human capital development in European Union countries. Park (2006) centered on the connection between human capital and economic development. However, there is a lack of investigation into the income distribution and index values of human capital in ECA countries,

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which is worthy of discussion. This study presents an alternative outlook on the issue.

On the other hand, Galor and Zeira (1993) noted that the long-term disparity of wealth in a society is determined by the initial income distribution. Moreover, Stiglitz (2013) suggests that access to education is the greatest factor in deciding an individual's prospects. In other words, economic wealth is a prerequisite for educational opportunities, and education is a path to higher income. Conversely, access to chances is determined by education, and educational access is contingent on economic circumstances. Taking that into account, this paper seeks to analyze the state of education in Turkey via a comparison of the Human Capital Index and income distribution of ECA countries. The purpose of this study is to answer the following questions:

(1) Why do the Human Capital Index values of ECA countries differ?

(2) What is the income distribution in the ECA countries?

(3) How are the socioeconomically disaggregated Human Capital Index values in Turkey?

Methodology

This paper is a review of the Human Capital Index values and income distribution of 48 countries in the Europe and Central Asia (ECA) region, based on literature documents and World Bank data. It then provides policy conclusions regarding education in Turkey. The following section first outlines the logic for the selection of the ECA countries, followed by an explanation of the methodology used to address each sub-problem of this research.

The World Bank (2020) calculates the Human Capital Index (HCI) using data from 157 countries. The scope of the study is limited to Europe and Central Asia, chosen from the World Bank's 2020 Human Capital Index (HCI) database. This paper examines 47 countries and Turkey. There are a few reasons for this selection. First, The World Bank calculated the Human Capital Index using the Program for International Student Assessment (PISA) results which draw attention to educational poverty (Aedo and Sosa, 2017), a learning crisis (Patrinos, 2022) and skills shortage (Murthi and Sondergaard, 2010) in ECA countries. For this reason, it is beneficial to assess the Human Capital Index and income inequality of ECA countries more in-depth. Second, human capital, as measured by schooling, explains 54% of the income gap between advanced economies and only 2% in ECA countries; accounting for learning, human capital contributes 86% of the difference in incomes across advanced economies and 11% in ECA countries, according to Angrist et al. (2021). This means that human capital explains only a small share of cross-country income differences in ECA countries compared to advanced economies.

It is therefore beneficial to take a closer look at human capital indices and income inequality in ECA countries in detail. Third, the 48 ECA countries selected for the study have varied income categories (29 high, 14 upper-middle, 4 lower-middle, and 1 low), thus making it a crucial factor to consider. For instance, research has found that students' socioeconomic backgrounds account for 12% of the variation in mathematics scores between ECA and European Union countries (Aedo and Sosa, 2017). This discrepancy underscores the need to clarify the income distribution of these countries. Additionally, Turkey ranks 53rd in the Human Capital Index, which measures 157 countries (D'Souza et al., 2019). Turkey ranks 34th among the 48 countries in the ECA group,

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which calls for further investigation. Moreover, given its geographic location as a bridge between Europe and Asia, Turkey possesses a unique position. Acemoglu and Robinson (2012) explain that even if there were initially minor disparities between societies, such distinctions can snowball into much more expansive institutional discrepancies. This decision aims to explore how countries with comparable geographic circumstances to Turkey - that start out with minimal disparities - can evolve differently in areas of economics, development, and education. Consequently, to understand Turkey's condition, the Human Capital Index and income inequality values of 48 countries in the ECA region are examined.

The aim of the first sub-problem of the study is to discover the reasons behind the varying Human Capital Index values[1] across countries in the ECA region. In addition, education value[2] and the duration of learning-based schooling[3] are closely reviewed. The second sub-problem of the study focuses on the income distributions of ECA countries, since inequality of income distribution has an influence on human capital investment and, subsequently, the share of income individuals acquire.

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[1]The World Bank (2020) calculates the Human Capital Index values by multiplying the values of survival rate, education, and health.

[2]The education value is an integral part of the Human Capital Index. This value is deduced from the expected years of schooling (ranging between 0 and 14) and corresponding international test scores. The international test scores are determined through internationally accredited tests, like the TIMMS and PISA, and are accounted for within a scale of 300 to 625 (Patrinos and Angrist, 2018).

[3] Calculation of the learning-based schooling indicator requires consideration of both the length of time a student has spent in school, and the quality of the school, as discussed by Filmer et al. (2018).

The Gini coefficient[4] and different percentile shares[5] are used in the analysis. The third sub-problem investigates the socioeconomically disaggregated human capital index value[6] of Turkey. This part presents the outcomes of the richest and poorest segments in Turkey, as well as the influence of income inequality on the Human Capital Index.

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[4] Income inequality is a complex issue that can be quantified by the Gini coefficient, a ratio that expresses the difference between the Lorenz curve and the diagonal (Morgan, 1962). The Gini coefficient, which has a range of 0 to 1, indicates how far the actual income distribution of a population deviates from perfect equality. If the Gini index is zero, this means that the population's income and population is distributed proportionally, with the lowest 10% of the population receiving 10% of the total income. However, if the Gini coefficient is one, this indicates that income and population are distributed disproportionately, with all income going to one person - a perfect example of inequality (Stiglitz, 2013). The larger the area between the Lorenz curve and the line of perfect equality (the diagonal), the greater the Gini index and the greater the inequality in the distribution of income (Kurul, 2012). The Gini coefficient is said to be zero when there is equal distribution of income and population, where the lowest 10% receives 10% of the total income, indicating a lack of inequality in society. On the contrary, in the case of perfect inequality, the coefficient attains a value of one when all income is obtained by one single person (Stiglitz, 2013).

[5] The P90/10 and P80/20 ratios are utilized to analyze income distribution inequality, with the P90/10 ratio comparing the income of the wealthiest 10% and the least affluent 10% of population, while the P80/20 displays how much the wealthiest 20% acquire in comparison to the poorest 20% (Organization for Economic Co-operation and Development (OECD), Income Inequality, n.d.). In a society which has no income inequality, these ratios should return a value of one. Moreover, Unal and Dogan (2021) suggest that an increase in these ratios is evidence of an increase in income inequality.

[6] The socioeconomically disaggregated Human Capital Index (HCI) value provides the capability to compare the HCI within a given country. Acknowledging the fact that it utilizes similar data to the HCI, D'Souza et al. (2019) find that slight adjustments in the calculation brings forth remarkable differences in the HCI scores, results from a country, and the global standards.

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Results

The primary aim of this study is to evaluate the relationships between Human Capital Index values and income distribution in ECA countries, with a particular emphasis on Turkey; moreover, to assess the implication of these associations on education. This part discusses the answers to the sub-objectives of the study in its individual sections.

Table 1 shows the Human Capital Index values of the ECA countries, and the education-related data used to calculate this value. Finland (0.80), Sweden (0.80), the Netherlands (0.79), Ireland (0.79) and Estonia (0.78) all have the highest Human Capital Index values, accompanied by the United Kingdom (UK) with 0.78. In terms of the average expected schooling, Sweden, the Netherlands, Ireland, and the UK lead with 13.9 years; Finland with 13.7 and Estonia with 13.5 being second and third, respectively. With regards to learning-based schooling, Finland and Estonia have 11.7 years, while Sweden and Ireland have 11.6 years; followed by the Netherlands and the UK with 11.5.

Estonia boasts the highest international test scores amongst these countries with 543 points, followed by Finland with 534, Ireland with 521, the Netherlands and the United Kingdom both earning 520 and Sweden taking 519 points. This success indicates that, in Finland, Sweden, the Netherlands, Ireland, Estonia, and the United Kingdom, a child born today would reach close to 80% of their full potential come the age of 18 due to the 11.5 years of learning-based schooling that these countries provide. Romania is the only exception to the fact that high-income countries have higher human capital indices relative to other income groups.

On average, the expected schooling years in ECA countries is 13.0 years, with an average international test score of 479 and a learning-based

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schooling period of 10.0 years. Turkey, on the other hand, has a slightly lower value compared to the international averages at 478 and 12.1 years, respectively. Moreover, it has a learning-based schooling time of 9.2 years. Consequently, the Human Capital Index for Turkey is 0.65, which is lower than the ECA average of 0.68. This indicates that a child born today will only reach 65% of his or her potential by the age of 18. Therefore, the conditions in the countries have an impact on the variables, creating discrepancies between the countries. This explains the reason for the discrepancies in the ECA countries' Human Capital Index values.

Table 1.

Human Capital Index in ECA Countries

Country	Expected schooling duration	International Test Scores	Learning-Based Schooling Duration	Human Capital Index Value of 2020
Albania (2)	12.9	434	9.0	**0.63**
Armenia (2)	11.3	443	8.0	**0.58**
Austria (1)	13.4	508	10.9	**0.75**
Azerbaijan (2)	12.4	416	8.3	**0.58**
Belarus (2)	13.8	488	10.8	**0.70**
Belgium (1)	13.5	517	11.2	**0.76**
Bosnia-Herzeg. (2)	11.7	416	7.8	**0.58**
Bulgaria (2)	12.3	441	8.7	**0.61**

Croatia (1)	13.4	488	10.4	**0.71**
Cyprus (1)	13.6	502	10.9	**0.76**
Czech Republic (1)	13.6	512	11.1	**0.75**
Denmark (1)	13.4	518	11.1	**0.76**
Estonia (1)	13.5	543	11.7	**0.78**
Finland (1)	13.7	534	11.7	**0.80**
France (1)	13.8	510	11.3	**0.76**
Georgia (2)	12.9	400	8.3	**0.57**
Germany (1)	13.3	517	11.0	**0.75**
Greece (1)	13.3	469	10.0	**0.69**
Hungary (1)	13.0	495	10.3	**0.68**
Iceland (1)	13.5	498	10.7	**0.75**
Ireland (1)	13.9	521	11.6	**0.79**
Italy (1)	13.3	493	10.5	**0.73**
Kazakhstan (2)	13.7	416	9.1	**0.63**
Kosovo (2)	13.2	374	7.9	**0.57**
Kyrgyzstan (3)	12.9	420	8.7	**0.60**
Latvia (1)	13.6	504	11.0	**0.71**
Lithuania (1)	13.8	496	11.0	**0.71**
Luxembourg (1)	12.4	493	9.8	**0.69**
Moldova (3)	11.8	439	8.3	**0.58**

Montenegro (2)	12.8	436	8.9	**0.63**
Netherlands (1)	13.9	520	11.5	**0.79**
North Macedonia (2)	11.0	414	7.3	**0.56**
Norway (1)	13.7	514	11.2	**0.77**
Poland (1)	13.4	530	11.4	**0.75**
Portugal (1)	13.9	509	11.3	**0.77**
Romania (1)	11.8	442	8.4	**0.58**
Russian Fed. (2)	13.7	498	10.9	**0.68**
Serbia (2)	13.3	457	9.8	**0.68**
Slovak Rep. (1)	12.6	485	9.8	**0.66**
Slovenia (1)	13.6	521	11.4	**0.77**
Spain (1)	13.0	507	10.5	**0.73**
Sweden (1)	13.9	519	11.6	**0.80**
Switzerland (1)	13.3	515	10.9	**0.76**
Tajikistan (4)	10.9	391	6.8	**0.50**
Turkey (2)	12.1	478	9.2	**0.65**
Ukraine (3)	12.9	478	9.9	**0.63**
United Kingdom (1)	13.9	520	11.5	**0.78**
Uzbekistan (3)	12.0	474	9.1	**0.62**

* It was created using data from the World Bank (2020, 2021).

** The figures next to each country represent an income classification system consisting of the following four categories: 1) High, 2) Upper middle, 3) Lower middle, and 4) Low-income.

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Table 2.

Gini Coefficients in ECA Countries

Country	The year of report	Gini coefficient	The year of report	Gini coefficient	The year of report	Gini coefficient
Albania	2015	0.329	2016	0.337	2017	0.332
Armenia	2017	0.336	2018	0.344	2019	0.299
Austria	2016	0.308	2017	0.297	2018	0.308
Azerbaijan	2003	0.268	2004	0.266	2005	0.266
Belarus	2017	0.254	2018	0.252	2019	0.253
Belgium	2016	0.276	2017	0.274	2018	0.272
Bos. -Herg.	2004	0.340	2007	0.331	2011	0.330
Bulgaria	2016	0.406	2017	0.404	2018	0.413
Croatia	2016	0.309	2017	0.304	2018	0.297
Cyprus	2016	0.329	2017	0.314	2018	0.327
Czech Rep.	2016	0.254	2017	0.249	2018	0.250
Denmark	2016	0.282	2017	0.287	2018	0.282
Estonia	2016	0.312	2017	0.304	2018	0.303
Finland	2016	0.271	2017	0.274	2018	0.273
France	2016	0.319	2017	0.316	2018	0.324
Georgia	2017	0.379	2018	0.364	2019	0.359
Germany	2014	0.309	2015	0.317	2016	0.319

Greece	2016	0.350	2017	0.344	2018	0.329
Hungary	2016	0.303	2017	0.306	2018	0.296
Iceland	2015	0.268	2016	0.272	2017	0.261
Ireland	2015	0.318	2016	0.328	2017	0.314
Italy	2015	0.354	2016	0.352	2017	0.359
Kazakhstan	2016	0.272	2017	0.275	2018	0.278
Kosovo	2015	0.265	2016	0.267	2017	0.290
Kyrgyzstan	2017	0.273	2018	0.277	2019	0.297
Latvia	2016	0.343	2017	0.356	2018	0.351
Lithuania	2016	0.384	2017	0.373	2018	0.357
Luxemburg	2016	0.317	2017	0.345	2018	0.354
Moldova	2016	0.263	2017	0.259	2018	0.257
Montenegro	2014	0.388	2015	0.390	2016	0.385
Netherlands	2016	0.282	2017	0.285	2018	0.281
North Mace.	2016	0.345	2017	0.342	2018	0.330
Norway	2016	0.285	2017	0.270	2018	0.276
Poland	2016	0.312	2017	0.297	2018	0.302
Portugal	2016	0.352	2017	0.338	2018	0.335
Romania	2016	0.344	2017	0.360	2018	0.358
Russian Fe.	2016	0.368	2017	0.372	2018	0.375
Serbia	2015	0.405	2016	0.388	2017	0.362
Slovak Rep.	2015	0.265	2016	0.252	2018	0.250

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Slovenia	2016	0.248	2017	0.242	2018	0.246
Spain	2016	0.358	2017	0.347	2018	0.347
Sweden	2016	0.296	2017	0.288	2018	0.300
Switzerland	2016	0.330	2017	0.327	2018	0.331
Tajikistan	2007	0.322	2009	0.308	2015	0.340
Turkey	2017	0.414	2018	0.419	2019	0.419
Ukraine	2017	0.260	2018	0.261	2019	0.266
Unit. King.	2015	0.332	2016	0.348	2017	0.351
Uzbekistan	2000	0.361	2002	0.330	2003	0.353

* It was created using data from the World Bank (n.d. Gini Index).

Table 2 indicates the use of the Gini coefficient in the second sub-objective of this study for assessing the income distribution of the countries in the Europe and Central Asia (ECA) region. This study assesses the last three Gini coefficients reported by ECA countries, providing the year of the report and corresponding figures. Turkey exhibits the strongest of income inequality (2019/0.419), followed by Bulgaria (2018/0.413) and Montenegro (2016/0.385) when considering the Gini coefficients reported by the countries in the most recent year. In the second reporting year, Turkey retained its highest Gini coefficient value (2018/0.419), followed by Bulgaria (2017/0.404) and Montenegro (2015/0.390). In the third year of reporting, the pattern is consistent, with Turkey attaining the highest Gini coefficient (2017/0.414), with Bulgaria coming second (2016/0.406) and Serbia third (2015/0.405). Consequently, the ECA nations with the most pronounced income inequality are Turkey, Bulgaria, Serbia, and Montenegro.

Averaging the Gini coefficient without considering the discrepant reporting years may not be entirely accurate. Nevertheless, the first reported value was 0.315, while the Gini for the subsequent reporting years were 0.317 and 0.315, respectively. Turkey possesses a higher coefficient than the average for the rest of the ECA countries, demonstrating the most extravagant level of income inequality.

As represented in Table 3, an analysis of the distribution of national income by percentiles and percentage share, is used to examine country income inequality. In the ECA region, Serbia, Romania, Bulgaria, and Turkey are the countries where the lowest 10% of the population receive the least amount of national income, with percentages of 1.4%, 1.6%, 1.9% and 2.0% respectively. Therefore, in this region, the 10% with the least earnings experience the sharpest disparity in wealth. People within the top 10% of the population in Bulgaria, Turkey, and Russia, which are part of the ECA region, receive one-third of the total national income. Population percentiles display 32.6%, 31.6%, and 29.9% respectively.

Table 3.

Distribution of National Income by Percentile and Percent Share Analysis in ECA Countries

Country name	The year of calcula.	The lowest 10%	The highest 10%	The lowest 20%	The highest 20%	P90/10 Ratio	P80/20 Ratio
Albania	2017	3.1	24.8	7.5	40.7	8.0	5.4
Armenia	2019	3.8	25.1	9.0	39.1	6.6	4.3
Austria	2018	2.9	23.9	7.9	38.7	8.2	4.8

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Azerbaijan	2005	4.8	24.2	10.8	37.8	5.0	3.5
Belarus	2019	4.2	21.3	10.0	35.4	5.0	3.5
Belgium	2018	3.5	22.2	8.9	36.4	6.3	4.0
Bos. &Herg.	2011	2.9	25.1	7.5	40.7	8.6	5.4
Bulgaria	2018	1.9	32.6	5.7	47.6	17.1	8.3
Croatia	2018	2.9	23.2	7.8	37.7	8.0	4.8
Cyprus	2018	3.5	27.2	8.4	41.4	7.7	4.9
Czech Rep.	2018	4.2	21.5	10.2	35.5	5.1	3.4
Denmark	2018	3.7	23.5	9.3	37.7	6.3	4.0
Estonia	2018	3.0	22.4	8.1	38.3	7.4	4.7
Finland	2018	3.8	22.6	9.3	36.8	5.9	3.9
France	2018	3.2	26.7	8.0	40.8	8.3	5.1
Georgia	2019	2.6	27.6	6.8	43.0	10.6	6.3
Germany	2016	2.9	24.6	7.6	39.6	8.4	5.2
Greece	2018	2.7	24.9	7.2	40.1	9.2	5.5
Hungary	2018	3.1	23.2	8.2	37.8	7.4	4.6
Iceland	2017	4.0	22.1	9.7	35.9	5.5	3.7
Ireland	2017	3.4	25.4	8.4	40.0	7.4	4.7
Italy	2017	1.9	26.7	6.0	42.1	14.0	7.0
Kazakhstan	2018	4.3	23.5	9.8	37.9	5.4	3.8
Kosovo	2017	3.8	24.6	9.2	38.6	6.4	4.1
Kyrgyzstan	2019	4.1	25.8	9.6	39.5	6.2	4.1
Latvia	2018	2.5	26.9	7.0	42.3	10.7	6.0
Lithuania	2018	2.3	27.1	6.6	42.8	11.7	6.4

Luxemburg	2018	2.5	26.9	6.6	42.2	10.7	6.3
Moldova	2018	4.4	22.0	10.2	36.0	5.0	3.5
Montenegro	2016	1.7	27.8	5.2	43.9	16.3	8.4
Netherlands	2018	3.5	23.0	8.9	37.2	6.5	4.1
North Mace.	2018	2.0	22.9	6.1	38.8	11.4	6.3
Norway	2018	3.4	22.2	8.9	36.6	6.5	4.1
Poland	2018	3.2	24.0	8.2	38.6	7.5	4.7
Portugal	2018	2.8	26.6	7.4	41.4	9.5	5.5
Romania	2018	1.6	24.9	5.4	41.2	15.5	7.6
Russia	2018	2.9	29.9	7.1	45.1	10.3	6.3
Serbia	2017	1.4	25.6	5.2	41.5	18.2	7.9
Slovak Rep.	2018	3.2	19.5	8.8	33.8	6.0	3.8
Slovenia	2018	4.2	21.0	10.1	34.9	5.0	3.4
Spain	2018	2.1	25.3	6.2	41.0	12.0	6.6
Sweden	2018	2.7	22.9	7.7	37.8	8.4	4.9
Switzerland	2018	2.9	25.8	7.5	40.8	8.8	5.4
Tajikistan	2015	3.0	26.4	7.4	41.7	8.8	5.6
Turkey	2019	2.0	31.6	5.4	48.0	15.8	8.8
Ukraine	2019	4.1	22.3	9.7	36.5	5.4	3.7
U. Kingdom	2017	2.6	26.7	6.8	42.1	10.2	6.1
Uzbekistan	2003	2.9	28.3	7.4	43.4	9.7	5.8

* It was created using data from the World Bank's (n.d.) World Development Index.

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Examining the population by percentiles, Serbia (5.2%), Romania (5.4%), and Turkey (5.4%) allocate the smallest portion of national income to the lowest 20% of the population. To clarify, only 5% of the national income is allocated to the 20% of the population with the least economic income in these countries. On the other hand, the leading 20% of the population in Turkey (48.0%), Bulgaria (47.6%), and Russia (45.1%) receive the highest percentage of national income. To be specific, the top 20% of the population in these countries acquire around a half of the national income.

The P90/10 and P80/20 ratios also show Turkey has high income inequality. The wealthiest 10% of the population receive a 15.8 times greater share of national income than the poorest 10%, while the wealthiest 20% get an 8.8 times higher share of national income than the poorest 20%. The next-high countries include Serbia (18.2), Bulgaria (17.1), Montenegro (16.3), and Romania (15.5) in the P90/10 ratio, and Montenegro (8.4), Bulgaria (8.3), Serbia (7.9), and Romania (7.6) in the P80/20 ratio.

Table 4.

Socioeconomically Disaggregated Human Capital Index Value

	Expected Schooling Duration		International Test Scores		Human Capital Index Values of 2020	
	The highest 20%	The lowest 20%	The highest 20%	The lowest 20%	The highest 20%	The lowest 20%
Turkey	11.1	7.9	521	426	0.77	0.49
Differ.50 cntr. *	2.4 year		55 points		0.15	

* The comparison of percentiles to the average of 50 countries reveal differences.

** It was created using data from the World Bank (World Bank (n.d.) SES-HCI).

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The third sub-objective of the study examines Turkey's socioeconomically disaggregated human capital index values, as presented in Table 4. The objective is to track the percentile differences of the population. As highlighted, the human capital index value for the richest 20% of Turkey is 0.77, while the human capital index value for the poorest 20% is 0.49 – a difference of 0.28, which is greater than the average of 50 countries (which is 0.15). Additionally, the average years of schooling for the richest 20% is 11.1 and for the poorest 20% is 7.9 – a gap of 3.2 years (the average of 50 socioeconomically disaggregated human capital indices is 2.4 years). Moreover, the international test score of the richest 20% is 521 and the score of the poorest 20% is 426 – a gap of 95 points (the average of 50 socioeconomically disaggregated human capital indices is 55 points). These data suggest that income inequality in Turkey is higher than the average of the 50 countries, most of which are low-income countries, as evinced by the Gini coefficients for Turkey and the P90/10 and P80/20 ratios.

Discussion and Conclusion

This study aims to investigate and compare the human capital indices and income distributions of ECA countries, and to evaluate the background of education data in Turkey. Subsequently, the study explains its objectives in relation to the research results by referring to relevant literature documents.

As indicated in its first objective, countries in Northern Europe, including Finland, Sweden, the Netherlands, Estonia, Ireland and the UK, display some of the highest Human Capital Index scores among ECA nations. Apart from Romania, the higher income countries tend to have

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greater Human Capital Index scores. Because these countries expect their students to be in school for at least 13.5 years, and because learning-related schooling lasts longer than 11.5 years, students in these countries typically score 520 or higher on international tests, with a maximum score of 625. Human capital indices are also high because of these educational investments. Children born in these countries can reach about 80% of their potential by the time they reach productive age. Lim et al.'s research (2018) corroborates this, demonstrating that Finland, Iceland, Denmark, and the Netherlands boast the highest levels of human capital.

On the other hand, the average values of Turkey's human capital indices are 3% lower than the average values of ECA countries, a finding supported by both TEDMEM (2018) and Emirkadi (2020). Consequently, in comparison to their potential, children born in Turkey will be able to reach only 65% of this potential at productive age. This calculation is based on future projections and thus speaks to the current state of the country. Sen (2000) evaluates the interconnection between education's social opportunity, a nation's politics, economy, and security. Brandolini and Rossi (1998) also reflect upon the impact of specific social structures on inequality and growth. Varied national heritages, such as religion, ethnic composition, and cultural traditions, lead to variant development rates (cited in Checchi, 2000). Thus, the reports of international organizations also support Turkey's lower human capital index score is just one result. For example, it is situated 64th out of 189 in the UNDP Human Development Index, 35th out of 38 in the OECD Better Life Index, 104th out of 167 in The Economist Democracy Index, and 107th out of 128 in the World Justice Project Rule of Law Index (Egilmez, 2022). In other words, Turkey faces with numerous shortcomings regarding development, justice, and democracy. There are numerous methods that

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can be employed to improve the present state. To this, Yilmaz and Danisoglu (2017) undertook research on human capital's contribution towards the economic development of Turkey based on the Human Development Index, showing that Turkey's educational metrics must be advanced. Additionally, Uyanik and Yesilkaya (2021) stress that the recruitment of women who have acquired higher qualifications could certainly have a noteworthy effect in lowering the implications of income disparity.

Moreover, when comparing Turkish children with kids from similar nearby locations, these children start life in a disadvantageous place when considering educational data and the conditions of their environment. This conclusion correlates with the OECD Children's Well-Being Outcomes (OECD, 2021) which identifies that the results of the well-being indicators for Turkey are deficient. It is unexpected that Turkey falls behind other comparable geographic locations when measured by its four basic domains: material health, physical health, cognitive and educational skills, and social and emotional well-being.

The study's second sub-objective primarily discusses income distributions based on the Gini coefficient. Turkey, Bulgaria, Serbia, and Montenegro hold the greatest degree of inequality in comparison to other ECA countries that belong to the upper-middle income group. Turkey has the largest average Gini coefficient in the ECA region, as recognized by Stiglitz (2013), who claims that Turkey's degree of inequality has decreased since the 1980s. The findings of Karaman and Ozcalik (2007) display a drop in Turkish income inequality between 2002 and 2005. Oz (2019) also substantiates the view that the gap separating the wealthiest and the poor has been reducing since 2000, showing a corresponding decrease in inequality. Nevertheless, Turkey still maintains an above-

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average level of inequality, notably in comparison to ECA countries with similar geographic characteristics. Perotti (1996) elucidates the connection between income inequality and socio-political instability, and its subsequent impact on investment via an unclear political and legal framework, together with disrupted market activities and labor relations. This encapsulates Turkey's last twenty years of governance. Therefore, it is valid to say that the inequality in the country, which had subsided after the 1980s, has grown since then. Moreover, Turkey has faced a harsh economic crisis in recent years accompanied by markedly high inflation. Similarly, Suhendra et al. (2020) emphasize that inflation likewise exacerbates the divide between the wealthiest and the most economically needy in Indonesia.

Subsequently, the researcher examines the dispersion of national income among the lowest and highest 10% and 20% of the population of the ECA countries to achieve the second sub-goal of this study. Serbia, Romania, Bulgaria, and Turkey grant the lowest percentile of national income to their lowest 10% of the inhabitants. Apart from Romania, the states mentioned constitute the upper-middle income group. Given this financial layout, the poorest 10% of population receive a quantity equivalent to or less than 2% of the country's total income. Among the population percentiles, the richest 10% get the most out of the national income in Bulgaria, Turkey, and Russia, with approximately one-third of national wealth divided among them. These results coincide with the findings of Topuz and Sekmen (2020). Sumer (2016) suggests that rising inequality could have adverse effects on economic growth, social welfare, and political stability. Lee and Lee (2018) note that this can occur due to its influence on the educational opportunities of talented but less advantaged individuals. Rodríguez-Pose and Tselios (2009) illustrate that

within the European Union from 1995 to 2000, there appeared to be a strong correlation between higher levels of educational inequality and higher economic inequality. Conversely, Coady and Dizioli (2018) suggest that increasing the length and quality of schooling can help to ease economic disparities, especially in developing countries. Hanushek (2013) asserts that improved education quality is a driving force of economic growth in developing nations. Mincer (1970) echoed this sentiment and discovered that one extra year of schooling boosts an individual's annual income by 11.5%, as reported by Kroch and Sjoblom (1994). More recently, Patrinos et al. (2022) concluded that attempts to keep children out of the classroom during the COVID-19 pandemic had a significant detrimental impact on their earning potential, resulting in a 3% loss of future income in ECA countries alone. In other words, income inequality has an impact on economic growth because those from low-income backgrounds are unable to attend school and develop talents that would otherwise be of benefit to the economy. Conversely, economic imbalance also influences educational attainment, leading to a decrease in future income. As a result, both income inequality and economic conditions result in lower future incomes.

In Serbia, Romania, and Turkey, the lowest 20% of the population people get the slightest portion of the national income, which is about 5%. On the other hand, the most richest 20% of the population in Turkey, Bulgaria, and Russia get the highest percentage share of the national income, with a figure being half of the entire national income. Stiglitz (2013) applies the analogy of a pie to illustrate inequality. When the pie is split equitably, each person receives a proportionate share. For instance, the top 1% of the population will get 1% of the pie. Nevertheless, if a country has extreme inequality, such as Turkey, the top 20% of population

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might take 50% of the resources, leaving only 50% of the pie for the rest of its citizens. In this regard, Lee and Lee (2018) further emphasis the essential role of human capital in terms of income distribution.

The second sub-objective of the study explores the P90/10 and P80/20 ratios in ECA countries, finding that Serbia, Bulgaria, Montenegro, Turkey, and Romania have the highest income inequality in both ratios. In this context, Castelló-Climent and Doménech (2021) point to a direct positive effect of human capital inequality on income inequality. Similarly, Suhendra et al. (2020) observed a significantly negative relationship between human capital and income inequality in Indonesia. Gennaioli et al. (2013) suggested that education as a measure of human capital is the factor that dictates the association between regional income and productivity. Furthermore, Becker and Chiswick (1966) support this notion, claiming that the levels of human capital in an economy will affect income equality, the greater the number of people with higher levels of human capital, the smaller the gap between the rich and the poor.

The third sub-objective of the study examines the socioeconomically disaggregated human capital index values in Turkey. The richest 20% have a human capital index value of 0.77, while the lowest 20% have a value of 0.49 in Turkey. Lim et al. (2018) observed a dramatic rise in Turkey's expected human capital index from 8 to 20 between 1990 and 2016; however, a substantial difference of outcomes between the richest and poorest remains evident. This difference is equivalent to approximately three years of schooling; a child from the top 20% goes to school three years longer than a child from the bottom 20%. There is no calculated result for the length of schooling based on learning ability. However, a gap of 100 points in international test scores further increases the inequality. This disparity is worse than the average of 50 countries

whose human capital index values were calculated by socioeconomically disaggregated status. Similarly, this is the case for South Africa, which ranks 126th out of 157 countries by human capital index scores (Friedrichs et al., 2021). Moyo et al. (2022) discussed how increased human capital in South Africa further affects poverty levels due to access to inferior education, which has a damaging impact on employment opportunities. In short, this issue is present in both underdeveloped and developing countries.

Notwithstanding, Schultz (1992) has emphasized the critical significance of human capital in the pace and structure of economic growth. Similarly, Lim et al. (2018) point out that countries with more improvements in human capital are likely to experience faster economic growth. Likewise, Vaitkevičius et al. (2015) point out the crucial role of human capital in economic growth. Moreover, Park (2006) suggests that investing in human capital to support all levels of education will increase economic growth in societies with limited resources. Furthermore, Campbell and Ungor (2020) reveal that human capital explains 24-34% of differences in output per worker across countries, with this figure rising to 34.9% in ECA countries. It is evident that human capital and economic progress are intimately interconnected.

In summary, Turkey has a lower human capital index than the countries in the European and Central Asian region. Second, with respect to the GINI coefficient, Turkey is among the upper middle-income countries and has the highest level of income inequality among the ECA countries. Third, in terms of income distribution between the lowest and highest income groups of the population, Turkey is among the worst performing countries. Fourth, Turkey is one of the countries with the highest levels of income inequality, as measured by the P90/10 and P80/20

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ratios. The wealthiest 10% of the population obtain 15.8 times as much national income as the least poor 10% in Turkey. Likewise, the richest 20% of the population receive 8.8 times more national income than the bottom 20%. There is an immense disparity between the top and bottom 20% of the population in Turkey, as indicated by the socioeconomically disaggregated values of the human capital index. If Turkey were to minimize income disparity, it would have a significant impact on its development, education, and wealth distribution. UNDP Human Development Reports reveal that inequality is a crucial factor affecting Turkey's development, accounting for 14.4% of the overall score. Moreover, unequal education and income distribution make up 13.6% and 23.1%, respectively, of Turkey's development (UNDP, n.d., inequality adjusted HDI). Stiglitz (2013) further supports the notion that the distribution of financial and human capital has an impact on the equality and inequality relations in society, which corresponds with Alkin's (2022) claim that improving the quality of human capital is integral to development. As a result, decreasing inequality necessitates specific solutions. In this regard, Egilmez (2022) believes it is important to promote an exploratory and analytical education system, which will minimize the reliance on rote learning. Even though the results of Driessen et al. (2016), Jeynes (2012), and Tuastad (2016) show that religious schools perform better, Driessen et al. (2016) note that this result does not hold for Islamic schools. That is, secular education is critical for Turkey.

Consequently, given the current social and political issues in countries like Turkey, it is evident that structural reforms must be comprehensive and focused on establishing a just rule of law based on universal human rights and the right to lead dignified lives (Agirdir,

2020). This goal is instrumental, as political, and political institutions determine the wealth and poverty of a country, not just economic factors (Acemoglu and Robinson, 2012). In this context, Alkin (2022) recognizes that justice, freedom, and education can change this situation. Egilmez (2022) advocates for creating justice in education, economics, and politics - the necessary components of successful change. To achieve this; a secular educational system based on democratic values, with the collective intent for the betterment of children and society, is the key for allowing gradual progress. In conclusion, necessary attention must be given to human capital now to remain competitive in the future, as investments will only yield returns eventually.

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About the author:

Elif Iliman Püsküllüoğlu, was graduated from Dokuz Eylul University's Foreign Languages Department in 2008. She worked as a teacher of English in the Ministry of Education for two years. She has been a research assistant at Mugla Sitki Kocman University since 2013. She got her master's degree in 2015 and her doctoral degree in 2023 from Mugla Sitki Kocman University. Among her research interests are organizational behavior (dissent, deviance, justice, democracy), administration of higher

education institutions, educational supervision, and the economics of
education.

E-mail: elif.iliman@gmail.com