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Reducing Inequalities through Higher Education and Economic Growth. Gender Analysis by Educational Degrees: Bachelor's, Master's and Doctoral Degrees

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Inequality is an economic and social problem, and its reduction is a concern in the recent decades. In this context, we decided to analyse the contribution of higher education, according to gender on its three levels (Bachelor`s degree, Master`s degree and Doctoral degree - or equivalent), and economic growth. Higher education and economic growth are factors of competitiveness, important in reducing inequalities in the EU. We applied the panel methodology to some indicators taken from the World Bank website for the period 2013–2018. Data validity narrowed the analysis to 19 European countries divided into two groups according to which we developed two models. Model 1 includes Austria, the Czech Republic, Poland, France, Greece, Slovakia and Slovenia, and Model 2 includes Belgium, Cyprus, Denmark, Finland, Germany, Hungary, Latvia, Lithuania, Malta, the Netherlands, Portugal and Sweden. The two groups differ not only in the number of countries but also in the period of analysis. For the first group, the period analysed is 2014–2017, and the applied model is Fixed Effects. For the second one, the analysed period is 2013–2018, and the applied model is Random Effect. The results show the importance of national characteristics in terms of the effect of higher education on reducing inequalities, despite efforts to standardise European practices. The increase in the number of higher education graduates highlight European inequalities, especially in the case of those with Bachelor's and Doctoral degrees. The results regarding the effect of the numerical increase of graduates with a Master's degree on inequalities are ambiguous. Equal access to education for women and men reduces inequalities, but the analysis captures the maintenance of women in a relatively vulnerable position in the European society and economy. Growth does not guarantee the absorption of inequalities because its transposition in the economy and society has antagonistic effects. There is a possibility to reduce inequalities due to higher growth rates, but this is also a possibility to increase them and to emphasize the differences between the rich and poor people and between the developed and developing countries.

Keywords: *European Inequalities; Higher Education; Economic Growth; Bachelor's Degree; Master's Degree; Doctoral Degree.*

Introduction

The relationship between inequality and education, and between inequality and economic growth are intensively studied subjects in economic and social analysis but, nevertheless, they remain open to debate. Economic theory has traditionally defined education, especially higher education, as a determining factor in reducing inequalities for development and competitiveness. Education offers the best qualifications to compete in the global economy, respond to technological changes, achieve higher productivity, increase incomes and reduce unemployment (Jozsef *et al.,* 2017; Mikulec, 2018; Agasisti & Bertoletti, 2020; Krstic *et al.,* 2020; Kristic & Pavlovic, 2020; Habibi & Zabardast, 2020; Buser *et al.,* 2021; Kopycka, 2021). Education generates knowledge, and knowledge translates into financial success, economic growth and profit maximization (Kyriakopoulos et al., 2020). However, there is a paradox regarding the emphasis of inequalities despite the evolutionary leap of humanity and internationalization. Globalization and internationalization remain debatable concepts which influence educational policy (Tight, 2019). Education has always been fundamentally international, but the process of internationalisation of higher education has intensified under the pressure of globalization, massification, privatization (Seeber *et al.,* 2018; Robson & Wihlborg, 2019), increasing women`s participation in economic and academic life, diversification and program changes (Dobbins & Kwiek, 2017). Internationalization has set the goal of increasing competitiveness around the world, and higher education contributes to achieving it and to increasing productivity. Each year of studies in addition to the average increases productivity by about 6.2 % and ensures higher employment rates (Krstic & Pavlovic, 2020). The educational act improves the quality of human capital, and higher education institutions create knowledge (Bugallo-Rodriquez & Vega-Marcote, 2020; Schneider, 2020). Human capital is absorbed by firms and exploited productively and competitively (Garcia-Alvarez-Coque *et al.,* 2019) because it generates growth and mitigates inequalities. Therefore, the differences between countries are explained by the degree of adult literacy, the share of people with higher education, access to education regardless of its level, science, technology and material basis (Gapsalamov *et al.,* 2020). In a society and economy based on knowledge and technology, the labour market is oriented towards the most qualified people with technological and digital skills, because in this way efficiency gains are obtained and sustainable development practices are promoted (Gkika *et al.,* 2020).

Education explains economic inequalities, justifies the differences between states but also the efforts of the least developed, in general the former communist countries in the central and eastern area, to implement reforms to align economically and standardize higher education systems. The European Commission encourages European higher education institutions to contribute to economic competitiveness, to produce human capital in line with labour market requirements and to develop closer relationships with the economy (Tavares & Sin, 2018). By developing a European Higher Education Area (EHEA), the EU has pursued a top-down convergence strategy with the aim of creating a strong higher education region capable of helping Member States compete with other parts of the world (Brooks, 2019).

Education has become an important component of development, and higher education reduces income inequality and stimulates competitiveness (Marinic & Pecina, 2021). This argument is the basis of the objective we proposed, namely the analysis of the contribution of higher education, according to gender on its three levels (Bachelor`s degree, Master`s degree and Doctoral degree - or equivalent) and economic growth, as competitiveness factors, to reduce European inequalities.

In this sense, we will outline the existing theoretical framework by reviewing the results of representative theoretical and empirical analyses, we will present the objective, research hypotheses, methodology and data, we will highlight the results to finally draw conclusions.

Literature Review

Education – Inequalities Relation

The issue of inequality is one of the most pressing concerns in research on education (Moller, 2017). Inequalities have increased everywhere in the world, including in Europe since the 1980s. A study carried out between 1980 and 2017 for 38 European countries concluded that income inequality was explained by inequality between countries more than by average incomes between Western, Northern and Eastern European regions. The most pronounced inequalities were recorded in Eastern Europe, while the Nordic states form the most egalitarian European region (Blanchet *et al.,* 2020). Educational factors, in this case its upper tier, allow for a more equal distribution of income along with government social spending (Kopycka, 2021), while a more equal distribution of education contributes to reducing inequalities (Lee & Lee, 2018). Access to education is a strategy for settling inequalities, according to Breen & Chung (2015). They consider that any feasible educational policy has little impact on income distribution. A positive, statistically significant, stable and low-intensity relationship between income inequality and the number of average school years was demonstrated by Coady & Dizioli (2018). Education reduces inequalities as years of schooling accumulate in emerging and developing countries. As countries develop, the relationship loses its intensity while the quality of education takes on the role of influencing inequalities.

Developed and developing countries are characterized by income inequality, which led Hall (2018) to analyse how the quality of education, measured by standardized international test scores, and the amount of education, measured by the average years of study, reduce inequalities. The marginal effect is strong for increasing the study period when considering the interactive effect of education, especially in developing countries and especially when analysing factors such as globalization, technological progress, the quality of institutions and education spending. Given that inequality is a major challenge to development, it creates obstacles in terms of access to education, especially for those from less rich backgrounds, and inequality in education at all levels, from primary to tertiary, reflects in inequality of incomes (Ferreira *et al.,* 2022). Higher education represents an important field for understanding the ways in which social inequalities are produced and reproduced, the cultural factor, which derives from education, being defining in relation to the level of inequalities (Tasci, 2021).

Economic Growth – Education - Income Inequalities – Gender Inequalities

Income inequalities can be reduced under the influence of many factors, with economic growth being the most important. Growth is effective in reducing inequalities, but the impact is ambiguous and depends on the underlying sources of growth, as shown in an analysis conducted by Cerra et al. (2021). Through various mechanisms, growth improves the education system and labour market opportunities, allowing for increased incomes and prospects for the future. Economic performance assessed with the help of positive rates of macroeconomic indicators contracts income inequalities and reduces the number of those living below the poverty line, as it results from an analysis at the European regional level (Michalek & Vybostok, 2018). Lee and Vu (2020) studied the relationship between economic complexity and income inequality. They noted that complex product-oriented economic structures are characterized by lower inequalities, while an increase in economic complexity accentuates them. This result, among other things, from the constraint imposed by limited knowledge, which does not allow social categories to benefit from occupational opportunities. Hence, the role of education in acquiring knowledge. This confers a comparative advantage on the labor market and reduces inequalities. The relationship between inequalities and the labor market was analysed by Barr and Miller (2020). Inequalities are more easily accepted by people with higher social status in rich societies and are justified by differences in productivity. In a relatively unequal society, highly educated people accept inequality more easily compared to those with a lower level of education. In a relatively egalitarian society, less educated people accept inequalities more easily compared to those with a higher level of education, but the difference is not significant. Social classes have different attitudes, values and preferences because they have different economic interests (Langsaether & Evans, 2020), and human capital inequality affects income inequality (Castello-Climent & Domenech, 2021).

It has been shown that inequalities also depend on the characteristics of the population (Mussida & Parisi, 2020). During crises, middle-class women, migrants and the

unemployed are socially affected in terms of income, and education becomes an absorber for middle-class people, while marital and employee status protects those in the lower class. An analysis of working conditions in a Czech academia environment using gender, sectoral and institutional inequalities through the perspective of labour market segmentation theory, concludes that gender is a key determinant in setting working conditions, and gender differences are reflected in wage income inequalities (Vohlidalová et al., 2021). Silva and Klasen (2021) showed that gender inequality, in the long run, is a barrier to development, and improving the relationship between gender inequality and development depends on increasing educational returns.

In the literature, there are studies analysing the relationship between economic growth, as a factor in reducing inequalities, and education. Glodowska (2017) noted that European countries were very different in terms of education and growth, and recently the disparities in growth and the taxonomic measure of education have been gradually reduced, confirming the manifestation of a positive relationship between education and growth, reinforced by the studies conducted by Johnes et al. (2017) and Macerinskiene & Aleknaviciute (2017). The institutional contribution to the higher education sector is significant because it mitigates the adverse effects of times of crisis. Higher education tends to increase GDP per capita by 11 % compared to the situation where there would be no higher education institutions, and significant differences in GDP per capita between European countries are associated with the activity of higher education institutions (Pastor et al., 2018). Their number stimulates regional economic growth given that economic inequalities are a central element for European countries whose causes are numerous (Agasisti & Bertoletti, 2020). In reducing inequalities, education takes a central place through the opportunities it creates and through its contribution to regional economic growth. Kabok et al. (2017) stated that the development of higher education was fundamental to European growth, development and competitiveness. Education forms human capital, offers comparative advantages, stimulates innovation and competitiveness. Growth differences between European states are explained by the different contribution of education (Macerinskiene & Aleknaviciute, 2017). Denkowska et al. (2020) noted that mass tertiary education did not necessarily lead to economic growth but the quality of education and the ability of graduates to use their skills and knowledge in the workplace had this capacity. The same conclusion emerged from a study conducted by Brooks (2019). He noted that the growing number of students in European higher education institutions did not equate to their satisfactory quality. Alzafari and Ursin (2019), following the analysis of twenty European countries, showed that higher education institutions developed their own quality standards according to their own or national needs.

Education is also related to economic performance in a study by Garcia-Alvarez-Coque et al. (2019). Its contribution to economic well-being is made in two ways: it develops the workforce which ensures more productivity and growth and it develops the capacity for innovation which ensures more competitiveness.

European Higher Education by Levels: Bachelor (BA), Master (MA) and Doctoral (PhD)

Higher education has a responsibility to make secondary education a successful experience for society and the economy. Continuing studies, after graduating from high school, is a choice that is based, with a predilection, on economic considerations - finding a suitable job, and family considerations – parents` level of education. The percentage of those pursuing higher education who came from families whose parents also have such education is higher than that of students originating from families whose parents do not have tertiary education. Young people whose parents have a low level of education report a clear intention to study less often before entering the first cycle of higher education, and once enrolled they demonstrate a low sense of belonging to the environment specific to higher education, as shown by a study by Hauschildt et al. (2021). The same analysis underlines the existence of differences between women and men enrolled in the European higher education system. It appears that the higher education system is dominated by students from high-income families. Students originating from low-income families who have access to higher education tend to have low rates of competitiveness, which translates into underdeveloped human resources and a deficit which materializes in an inability to generate and capture economic and social benefits, as a study by Salmi and D`Addio (2020) shows.

The transition from one educational level to another is not equal between European countries, either by percentage or by gender. In Austria, Croatia, Georgia, Ireland, Luxembourg, the Netherlands, Norway, Portugal and Romania, a high proportion of women enroll in the first level of higher education immediately after finishing high school. Women in Switzerland, Estonia, Sweden and Italy show a longer transition between high school and undergraduate studies.

Access to the first level of higher education depends exclusively on the results obtained in high school, each level is the basis of the previous one, and success depends on the one obtained previously (Koprivica, 2010), but also on students` involvement in the learning process (Caruth, 2018). Bachelor's degree allows entry and active participation in the labour market, but also serves the purpose of re-entering the higher education system to follow the master's and doctoral level. Generally, the transition from bachelor to master is not longer than 1–2 years, a visible aspect in Germany, Italy, Czech Republic, Slovenia and Denmark. In these countries, 90 % of graduates of bachelor studies enrol in their higher level - master during this period of time. This period is longer in Iceland, Estonia, Norway, but especially in Ireland and Malta. The transition period is related to labour market experiences. Students who are active in the labour market tend to enrol in master's level studies later and attend them part-time. In Finland, Norway and the Netherlands, there are large differences between part-time and full-time master's students. Also, students with a more precarious socio-economic base or who are older enter the higher education system with a gap, on alternative paths deriving from the traditional ones or after long periods of activity on the labour market.

Between 2010 and 2020, enrolment in doctoral studies in Europe increased by 40 %, according to a study by Hnatkova et al. (2022). Attending doctoral studies is associated with the desire for career development, especially the academic one, but this is not the main reason for doctoral studies, rather, it is intrinsic. Doctoral studies no longer serve exclusively the academic profession, but have become a qualification for knowledge-intensive non-academic sectors and help professional development to such an extent that it has moved to the higher level, that of post-doctoral studies, especially in European countries (Bao et al., 2018). Traditionally, the holder of a Doctoral degree was considered part of the elite of society, but nowadays, under the pressure of competition, the choice to pursue doctoral studies is based on the requirements and needs of the labour market (Leser *et al.,* 2018). For example, in Germany, only 10 % of Doctoral graduates remain in academia (Bao et al., 2018). Doctoral graduates represent, according to Lešer et al. (2018), an essential resource of knowledge- and technology-dominated economy.

The difference between undergraduate and doctoral graduates, according to a study conducted by Bok (2010), lies in the amount of knowledge assimilated and how it is used. While a graduate with a Bachelor's degree does not have a personal development plan and needs support in subsequent activities, a graduate with a Doctoral degree has well-defined plans, is independent and self-taught in the activities later developed.

A study by Botcher & Thiel (2018), in which a competence model was designed, states that the overcoming of stages in higher education helps developing skills. If Bachelor's level students have limited theoretical skills, those at Master's level have theoretical and practical skills while those at PhD-level deal with the entire theoretical-practical process, are experienced and demonstrate a high degree of competence, they have a developed critical spirit and the ability to make evaluations. Practically, the graduates of doctoral studies have the highest level of qualification and knowledge.

Research objective, Data and Methodology

The Research Objective

The objective of this paper is to analyse the contribution of higher education according to gender on its three levels (Bachelor`s degree, Master`s degree and Doctoral degree - or equivalent) and economic growth, as factors of competitiveness, to reduce European inequalities. We initiated the research starting from four hypotheses and a series of sub-hypotheses as follows:

H1. *Graduation from the first cycle of higher education (Bachelor`s degree or equivalent) contributes significantly to the reduction of European inequalities* (H1.1. The number of holders of Bachelor`s degree or equivalent contributes significantly to the reduction of European inequalities; H1.2 The number of female holders of Bachelor`s degree or equivalent contributes significantly to the reduction of European inequalities; H1.3 The number of male holders of Bachelor`s degree or equivalent significantly reduces European inequalities);

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H2. *Graduation from the second cycle of higher education (Master`s degree or equivalent) contributes significantly to the reduction of European inequalities* (H2.1 The number of holders of Master`s degree or equivalent contributes significantly to the reduction of European inequalities; H2.2 The number of female holders of Master`s degree or equivalent contributes significantly to the reduction of European inequalities; H2.3 The number of male holders of Master's degree or equivalent contributes significantly to the reduction of European inequalities);

H3. *Graduation from the third cycle of higher education (Doctoral degree or equivalent) contributes significantly to the reduction of European inequalities* (H3.1 The number of holders of Doctoral degree or equivalent contributes significantly to the reduction of European inequalities; H3.2 The number of female holders of Doctoral degree or equivalent contributes significantly to the reduction of European inequalities; H3.1 The number of male holders of Doctoral degree or equivalent contributes significantly to the reduction of European inequalities);

H4. *Economic growth contributes significantly to reducing European inequalities.*

Data

The indicators analysed are taken from the World Bank website. We used the Gini index to assess inequalities. It measures the distribution of income, or, as the case may be, of expenses, among individuals. A value index of 0 illustrates a perfect equality, while a value of 100 represents a perfect inequality. The company with the equal distribution of income is the one in which each person receives the same income, i.e. the value of the Gini index is 0, and the most unequal is the one in which one person receives the entire income of the company and the rest of the people receive nothing. Based on this presumption, Gini is an index of inequality. We described higher education through indicators referring to the percentage of the population over 25 with a Bachelor's degree or equivalent (edubt - educational attainment, at least Bachelor`s degree or equivalent - total (%)), with a Master's degree or equivalent (edumt - educational attainment, at least Master`s degree or equivalent - total (%)), with Doctoral degree or equivalent (edudt - educational attainment. at least Doctoral degree or equivalent - total (%)) by total and by gender edubf/edubm, edumf/edumm, edudf/edudm). For economic growth, we opted for the values of the GDP rate.

The indicators describing the participation of the population in higher education are deficient, which explains the lack of empirical studies in the literature and made us exclude Bulgaria, Croatia, Estonia, Italy, Ireland, Luxembourg, Romania and Spain from the analysis. We divided the rest of the member countries into two groups, the criterion being the validity of the data and we set up two models: the first includes Austria, the Czech Republic, Poland, France, Greece, Slovakia and Slovenia, and the period analysed is 2014–2017, and the second includes Belgium, Cyprus, Denmark, Finland, Germany, Hungary, Latvia, Lithuania, Malta, Netherlands, Portugal, Sweden, and the period analysed is 2013–2018

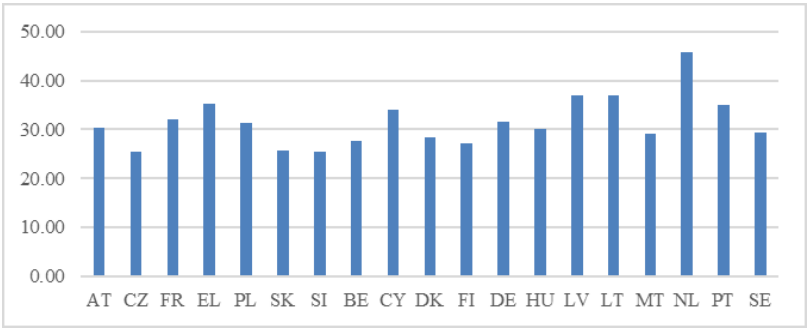

Figure 1. Average Value of Gini (2014–2018). *Source: World Bank site*

The average European income inequality varies between 45.93 in the case of the Netherlands and 45.93 in the case of the Czech Republic and Slovenia. Higher average inequalities characterise countries such as Lithuania (36.97), Latvia (36.97), Greece (35.3) and France (32.13). At the opposite pole, we find Slovakia, a European country characterised by low average income inequalities (25.73). For most European states, income inequality decreased between 2014 and 2018, although there were some exceptions. In Finland, Latvia, Lithuania and Sweden, the trend of the Gini coefficient is slightly fluctuating, while in the case of Germany, it is relatively constant.

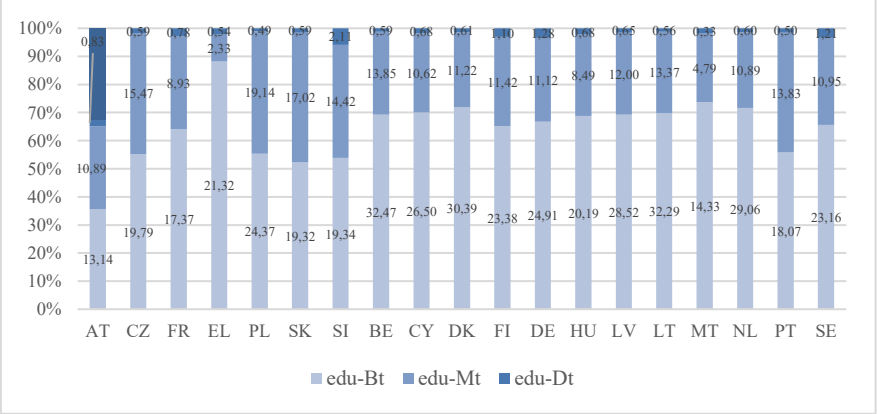

Figure 2. The Average Percentage Of Participation in the Higher Education System (BA, MA, PhD - total) (2014–2018). *Source: World Bank site*

The differences between the average percentage of people enrolled in each of the three levels of higher education are significant. The largest share of enrolments is for the first level, Bachelor's degree (BA). Continuing higher education is an option for far fewer first-cycle graduates. Big differences are found in the case of Greece, but not only. For example, 21.32 % of the Greek population follow bachelor's degree studies, only 2.33 % continue them by being enrolled in the secondary level and 0.54 % follow doctoral studies. In countries such as Austria, the Czech Republic and Slovakia, the differences between the share of those enrolled in the first and second levels of higher education are relatively small, which indicates a high inclination of the population towards higher education. A high share of the population following the first level of higher education is found in Belgium (32.47 %), Lithuania (32.29 %) and Denmark (20.39 %). At the opposite pole are Malta (14.33 %) and Austria (13.14 %).

Enrolments in the second level of the higher education system are high in Poland (19.14 %), Slovakia (17.02 %) and the Czech Republic (15.47 %). Regarding enrolment in the third level, the strong drop in participation compared to the first two levels is noticeable. The highest ratio of people pursuing doctoral studies is found in Slovakia (2.11 %), Germany (1.28 %) and Finland (1.1 %). Malta is the country with the lowest percentage of students enrolled in the third level of the higher education system (0.33 %) followed by Portugal (0.5 %) and Poland (0.49 %).

Enrolment growth in European higher education is the dominant trend of the 2014–2018 period. There are also exceptions: the percentage of those enrolled in the first level fluctuated in the case of Austria, decreased in that of Greece and decreased in 2018 in Hungary and Portugal; the percentage of those enrolled in the second level fluctuated in the case of Greece, decreased in 2018 in Germany and Portugal, fluctuated on generally increasing trend in Hungary and decreased in Lithuania; the percentage of those enrolled in the third level decreased until 2017 in Austria, followed a generally increasing trend in Greece and Denmark, and decreased in 2018 in Greece and the Netherlands.

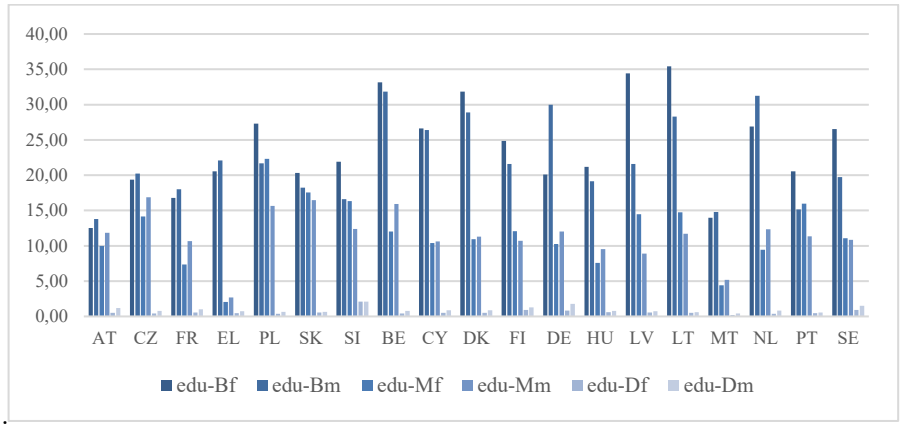

Figure 3. The Average Percentage of Participation in the Higher Education System (BA, MA, PhD – analysis by gender) (2014–2018). *Source: World Bank site*

The average percentage of women enrolled at the first level of the higher education system (Bachelor's degree) is higher than that of men in a considerable number of European countries (Poland, Slovakia, Slovenia, Belgium, Denmark, Finland, Hungary, Latvia, Lithuania, Portugal and Sweden) while the ratio is relatively equal in Cyprus. The average percentage of women enrolled in the second level of the higher education system (Master's degree) is higher than that of men in Poland, Slovakia, Slovenia, Finland, Lithuania, Latvia, Portugal and Sweden, while the ratio is relatively equal in Cyprus and Greece. Doctoral studies (third level) are dominated by men in most European countries except Slovenia.

The analysis of women enrolment in the first level of higher education (Bachelor's degree) shows that the highest percentages, on average, are recorded in Latvia (35.42 %), Lithuania (34.44 %) and Belgium (33.18 %), while the lowest percentages recorded in Austria (12.53%) and Malta (13.99 %). The participation of men is high in Belgium (31.82 %), the Netherlands (31.24 %) and Germany (30.00 %), while their presence is low in Austria (13.79 %) and Malta (14.79 %). The participation of women at the second level (Master) is high in Slovakia (17.54 %), Poland (22.31 %) and Slovenia (16.36 %) and low in Malta (4.41 %) and Greece (2.04 %), while the participation of men is higher in the Czech Republic (16.87 %), Slovakia (16.46 %) and Poland (15.65 %) and lower in Malta (5.18 %) and Greece (2.7 %). Substantial gaps between European countries according to gender are also recorded regarding participation in the third level of higher education (Doctorate). The countries where the percentage of women is high are Slovenia (2.1 %), Finland (0.93 %) and Sweden (0.92 %) while in the Netherlands (0.36 %) and Malta (0.18 %) we find the lowest percentage of women enrolled in the last level of higher studies. Men dominate the tertiary level in Slovakia (2.09 %), Germany (1.76 %) and Sweden (1.51 %) and have modest participation in Portugal (0.56 %) and Lithuania (0.43 %).

The general trend is to increase enrolment of women and men in the higher education system. There are some exceptions though. The participation of women at the first level is decreasing in Greece, the participation of men decreased in Portugal in 2018. In addition, in Portugal, the share of participation of women and men in the second level of higher education decreased in the same year. Also, the share of men decreased in Germany in 2018, and in Lithuania the trend of men's participation in the second level of higher education is decreasing. Female participation in tertiary education is fluctuating in Austria and slightly decreasing in the Czech Republic, Poland and Denmark, whereas male participation is fluctuating in Poland and Cyprus and slightly decreasing in Denmark, Germany and Lithuania.

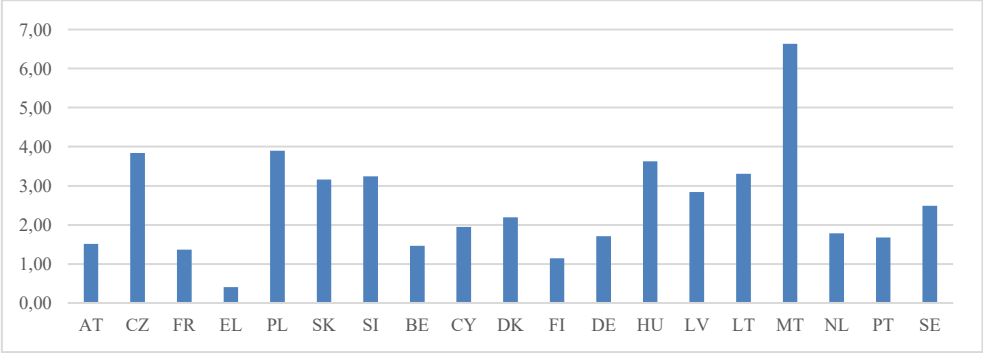

Figure 4. Average European Economic Growth (2014–2018). *Source: World Bank site*

The average growth rate does not reflect its relationship with participation in higher education or the reduction of inequalities. Malta recorded the highest average rate of economic growth (6.63%) but does not excel in enrolment

in the higher education system, nor is it the country with the most mitigated level of inequalities. Under these conditions, the simple study of growth, educational and income inequality indicators is not enough to draw conclusions regarding the effects of higher education and growth on the reduction of European inequalities, their empirical processing being necessary.

Methodology

Stage 1

Empirical analysis is of the panel data type. The first stage in the application of the methodology consists in determining the stationarity and the existence or non existence of united roots. We apply the Levin-Lin-Chu test to see if the dependent variable, in our case gini, has root unit. The main advantage of using panel unit root tests is the superior explanatory power of standard tests. The null hypothesis assumes the existence of a root unit, and the alternative hypothesis refers to stationarity. If the condition of stationarity is not met, cointegration tests will be applied to determine the long-term stability of the relationship. Thus, we choose the Hadry LM test that will be the benchmark in determining the condition of stationarity and the existence of unit roots.

Stage 2

The second stage consists of choosing one of the three models specific to panel analysis: Pooles OLS Regression, Fixed Effect, or Random Effect. In the case of the first model, the nature of the cross-section and time series data is neglected. The major limitation of the model is the impossibility of distinguishing among countries, all group entities being considered an individuality. The Fixed Effect model eliminates the deficiency of the former, but allows variability over time. The Random Effect model provides a common average value for the intercept.

Stage 3

To see which of the three models is the right one, we use Haussman Test and Breusch and Pegan LM Test. We apply Fixed Effects to analyse the impact of variables over time. Each country in the model has its own characteristics which can influence the predictive variables. Fixed Effects eliminate the effect of invariant characteristics over time so that we can evaluate the net effect of predictors on the result variables. Another important assumption is that the time-varying characteristics are unique to each country and should not be correlated with other individual characteristics. In the case of Fixed Effects, the slope of x is the same for all entities. The specific Equation of Fixed Effects Model equation is:

$$Y_{it} = \beta_1 X_{it} + \ldots + \beta_k X_{kt} + \alpha_1 + u_{it} \quad (1)$$

where: α1 (i = 1,…, n) is the unknown intercept for each unit (n entity-specific intercepts); Yit is the dependent variable, i represents the countries, and t is the time; Xit represents the independent variable; β is the coefficient of the independent variable; forget is the error term.

The reasoning behind the Random Effects model is that the variation among countries is random and uncorrelated with the predictive variables included in the model. As long as the differences among countries have a certain influence on the dependent variable, then Random Effect is the correct model. The Random Effects model is:

$$Y_{it} = \beta^* X_{it} + \alpha + u_{it} + \varepsilon_{it} \quad (2)$$

where: Xit represents the independent variable; β is the coefficient of the independent variable; α is the intercept; u_{it} is the error between entities; εit is the error within the entities.

Results and Discussions

Hypothesis Testing - H1-H3

In the case of both models, we first test the heterogeneity in time and space (Figure 5)

Figure 5. Heterogeneity Testing

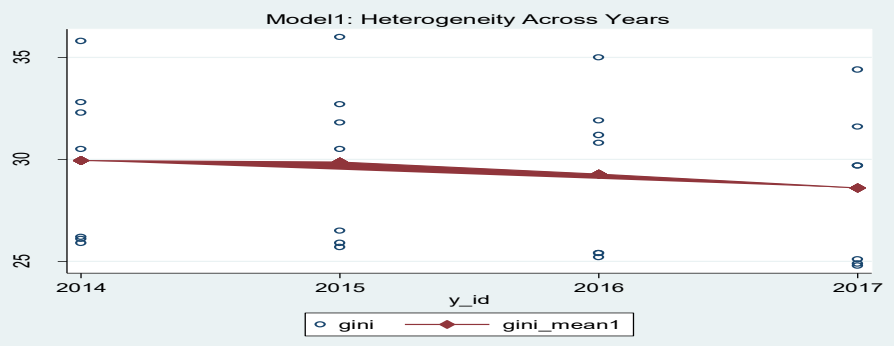

Figure 5a: Testing Heterogeneity Across Years for Model 1

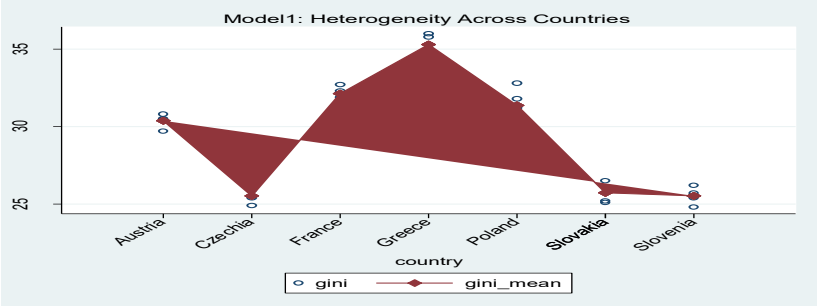

Figure 5b: Testing Heterogeneity Across Countries for Model 1

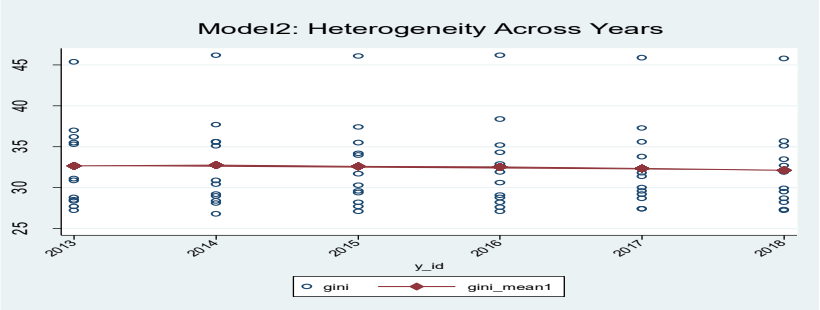

Figure 5c: Testing Heterogeneity Across Years for Model 2

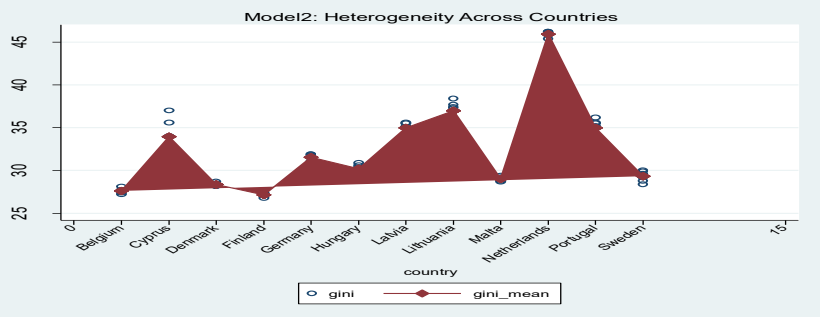

Figure 5d: Testing Heterogeneity Across Countries for Model 2

The next methodological step is to determine if there are unit roots or not. For this purpose we applied Levin-Lin - Chu Test to both models. The first model is not stationary and it has unit roots. The second is stationary and it has no unit roots, as shown by the values in table 1

Table 1

Levin-Lin-Chu and Hadri LM Tests

		Model 1		Model 2	
		Levin-Lin-Chu Test			
		Statistic	p-value	Statistic	p-value
Unajusted t		0.6547	1.0000	- 2.8665	0.0109
Adjusted t		5.6e+14		- 2.2940	
		Hadri LM Test			
z	Statistic	4.7112		2.3756	
	p-value	0.0000		0.0088	

Source: authors`calculations

In the case of both models we apply, for the verification of stationarity, a cointegration test (Hadri LM test) to determine whether there is a long-term relationship between the series. This time, in the case of both models, the results show that the panels are non-stationary and have united roots, which is why we convert the explanatory variable into Fast Difference and demonstrate the stationariness of the panels. We use the Wooldridge test to determine the lack of serial correlation, in the case of both models (table 2).

Table 2

Wooldridge Test for Model 1 and Model 2

Model 1	Model 2
F(1,6) = 7.457	F(1,11) = 18.084
Prob>F = 0.0342	Prob>F = 0.0014

Source: authors`calculations

We applied the Hausman Specification Test to choose the correct model in the case of the two panels (table 3).

Table 3

Hausman Test for Model 1 and Model 2

Variables	Coefficients of Model 1		Coefficients of Model 2	
	Fixed Effects (fe)	***Random Effects (re)***	***Fixed Effects (fe)***	***Random Effects (re)***
edubt	3.12	-1.6	1.9	1.9
edubf	- 1.71	0.99	- 0.95	0.96
edubm	- 1.23	0.74	- 0.78	- 0.82
edumt	- 45.21	- 7.54	- 0.62	- 0.6
edumf	22.89	4.15	0.07	0.08
edumm	21.92	2.87	0.39	0.38
edudt	37.59	- 9.39	6.57	6.72
edudf	- 18.83	- 1.14	- 3.24	- 3.43
edudm	- 20.4	8.55	- 2.67	- 2.84
gdp	0.2	- 0.41	- 0.28	- 0.28
chi2(10)	428.36		0.16	
prob>chi2	0.000		1.000	

Source: authors`calculations

Hausman test shows that in the case of the first panel, the most suitable is the Fixed Effects model, and in the case of the second, the most suitable is the Random Effects model.

Pesaran test applied to the panels provides information on the serial correlation, and the Modified Wald Test on heteroskedasticity.

Table 4

Pesaran CD Test for Model 1 and Model 2

	Model 1	Model 2
Pesaran Test		
Pesaran`s Test of Cross Sectional Independence	0.318	- 0.944
Pr	0.7502	0.3454
Average Absolute Value of the Off-Diagonal Elements	0.559	0.418
Modified Wald Test		
chi2(7)	345.33	321.19
Prob>chi2	0.0000	0.0000

Source: authors`calculations

There is no serial correlation, and residuals are heteroskedastic, which is a deficiency of the models which do not prevent us from continuing the methodological approach.

The value of the correlation of u_i errors with the regressors, of - 0.5141 and Prob> F of 0.0004, below the significance threshold, shows that the model is good. The interclass correlation reveals that, in the proportion of 99.38 %, the variation of inequalities is determined by the individual characteristics regarding education and growth of each country included in Model 1, 90 % by the specific characteristics of each country, and 21.28 % by the relationships among states. The value of the interclass correlation confirms this. Higher education and economic growth explain inequalities by around 23 %, justified by the effect of other determinants, which we do not analyse here.

Table 5

Fixed Effects Model

gini	Coef	t	P>|t|	[95% Conf. Int]	
edubt	3.12	3.41	0.006	1.11	5.14
edubf	- 1.71	- 3.24	0.008	- 2.88	- 0.55
edubm	- 1.23	- 2.43	0.033	- 2.35	- 0.12
edumt	- 45.21	- 4.53	0.001	- 67.16	- 23.27
edumf	22.89	4.33	0.001	11.27	34.52
edumm	21.92	4.66	0.001	11.56	32.62
edudt	37.58	5.5	0.000	22.54	52.62

gini	Coef	t	P>|t|	[95% Conf. Int]	
edudf	- 18.83	- 4.91	0.000	- 27.27	- 10.38
edudm	- 20.4	- 6.04	0.000	- 27.83	- 12.96
gdp	0.2	2.24	0.047	0.003	0.38
_cons	33.01	12.87	0.000	27.37	38.66
rho	0.9938				
R-sq	***within***	0.9001			
	between	0.2128			
	overall	0.2257			
Prob>F	0.0000				

Source: authors`calculations

Higher education, overall and by gender, and economic growth influence European inequality in the countries included in Model 1, and in the absence of higher education and economic growth, inequality would be higher (β_0 = 33.01).

An increase by one unit in the number of holders of a Bachelor's degree or equivalent accentuate inequalities (β_{edubt} = 3.12). Gender analysis shows that a high number of graduates of the first cycle of the higher education system, women or men, tend to reduce European inequality for the states in Model 1 (β_{edubf} = -1.71; β_{edubm} = -1.23). We refute H1.1, validate H1.2 and H1.3, which prove that reducing inequalities depends on gender balance in the labour market because of balanced access of women and men to higher education.

The completion of the second cycle of the higher education system has a substantial effect in reducing European inequalities because increasing by one unit in the number of holders of a Master's degree or equivalent reduces inequality by 45 units. Gender analysis leads to the validation of hypothesis H2.1, and refutation of H2.2 and H2.3. Inequalities are reduced under the influence of the increase in the number of graduates of the second cycle of higher education, regardless of gender (β_{edumf} = 22.89; β_{edumm} = 21.92).

Regarding the third cycle of the higher education system, the results reveal a relative similarity with the first cycle. Therefore, the increase in the total number of the holders of a Doctoral degree or equivalent tends to accentuate European inequalities (β_{edudt} = 37.58), but the analysis by gender shows a tendency to reduce them when the increase in the number of graduates occurs for both women and men (β_{edudf} = -18.83; β_{edudm} = -20.4). We refute hypothesis H3.1 but validate H3.2 and H3.3, because a relatively balanced increase in the number of women and men obtaining a Doctoral degree or equivalent reduces European inequalities.

Economic growth slightly exacerbates inequalities in Model 1 countries (β_{gdp} = 0.2). This result can be explained by the fact that growth is limited, in the absence of adequate government support, to the quantitative expansion of economic quantities without necessarily affecting people's incomes, thus contracting inequalities. These conclusions refute the H4 hypothesis.

Table 6

Random Effects Model

gini	Coef	z	P>|z|	[95% Conf. Int]	
edubt	1.9	2.02	0.043	0.059	3.73
edubf	- 0.96	- 1.97	0.048	- 1.92	- 0.007
edubm	- 0.82	- 1.73	0.08	- 1.74	- 0.11
edumt	- 0.6	- 0.69	0.489	- 2.31	1.10
edumf	0.08	0.16	0.872	- 0.9	1.07
edumm	0.38	0.86	0.388	- 0.49	1.25
edudt	6.72	2.29	0.022	0.96	12.49
edudf	- 3.43	- 1.68	0.093	- 7.42	0.57
edudm	- 2.84	- 1.62	0.105	- 6.28	0.6
gdp	- 0.28	- 5.71	0.000	- 0.37	- 0.18
_cons	31.45	9.79	0.000	25.16	37.75
rho	0.9950				
R-sq	***within***	0.4555			
	between	0.0385			
	overall	0.0476			
Prob>F	0.0000				

Source: authors`calculations

The values obtained for Model 2 confirm those already obtained for Model 1. The interclass correlation shows that 99.5 % of the variation of inequalities is determined by the individual characteristics of education and growth of each country included in Model 2, 45.55 % of the variation of inequalities is due to each country specific characteristics and 3.85 % is explained by the relationships among states, reinforced by the value of the interclass correlation.

In the absence of higher education and economic growth, European inequality would increase (β_0 = 31.54). The value of the intercept is very close to the one we obtained for Model 1. Six of the ten dependent variables are

less statistically significant, namely edubm (p-value = 0.080), edumt (p-value = 0.489), edumf (p-value = 0.872), edumm (p-value = 0.388), edudf (p-value = 0.093) and edudm (p-value = 0.105). The explanations could be found, mainly, in the psychological and social sphere because they send us to gender and mentality differences. The traditions, customs and politics of each country explain part of the results obtained. The different number of countries, 7 and 12, respectively, explains the difference between the values obtained for Model 1 and Model 2, but Random Effect confirms the results obtained by applying Fixed Effects except for those related to economic growth, which remains a determinant of the inequalities reduction.

Therefore, hypotheses H1.3, H2, H3.2 and H3.3 can be validated or not due to lack of statistical significance. The coefficients of the model for the first cycle of higher education show that we can refute the hypothesis H1.1 and validate H1.2. Increasing the total number of holders of a Bachelor's degree or equivalent does not reduce inequalities, but increasing the number of female graduates reduces them. If there had been statistical significance for male graduates of the first cycle of higher education, hypothesis H1.3 would have been validated ($\beta_{edubm} = -0.82$).

For the second cycle of higher education, the total number of holders of a Master's degree would have reduced inequalities ($\beta_{edumt} = -0.6$), and hypothesis H2.1 would have been validated if the results had been statistically significant. Their gender breakdown would have accentuated inequalities, and hypotheses H2.2 and H2.3 would have been refuted ($\beta_{edumf} = 0.8$; $\beta_{edumm} = 0.38$).

Continuing studies and having a Doctorate degree or equivalent by a growing number of people does not reduce inequalities but accentuates them. Hypothesis H3.1 is refuted, and hypotheses H3.2 and H3.3 are not confirmed because the results are not statistically significant. Gender balance in the number of the holders of a Doctorate degree would have reduced European inequalities statistically significant conditions ($\beta_{edudf} = -3.43$; $\beta_{edudm} = -2.84$).

Hypothesis Testing – H4

Regarding the effect of economic growth on European inequalities, the results differ from the previous ones. An increase in GDP reduces inequalities ($\beta_{gdp} = -0.28$). This is not surprising and can be explained because economic growth does not guarantee income increase or the absorption of inequalities. So, this time, we confirmed H4.

The analysis of the correlation between the variables shows that the number of the holders of a Bachelor's degree determines the number of the holders of a Master`s and Doctoral degree, in total and by gender. It is an explicable result because the transition to a higher level within the higher education system is conditioned by the completion of the previous one. In the case of Model 2, we find that, in general, the increase in the number of higher education graduates, especially holders of a Bachelor's and Doctorate degree, accentuates European inequalities, while the increase in the number of female holders of a Bachelor's degree, for which we have statistically significant results, reduces European inequalities. This result confirms the still delicate position of women in society, an aspect which requires attention and support through European economic policy. Economic growth, on the other hand, reduces the European inequalities.

Analysis of the European Educational Context – Geographical Segmentation

Education, along with innovations, are determinants of development and competitiveness, enabling social cohesion and improving the quality of life. The influence of education on the development of Europe is significant and indisputable. Europe has achieved results in the field of education with a positive contribution to productivity, innovation and competitiveness. The European Commission's policies and the Bologna process have created a market for higher education. Reform is the consequence of a process of political reorganization which calls into question national systems (Grek *et al.,* 2009). Policy implementation is difficult because the European Union has a relatively high number of members, unequal in terms of balance of power, with its own priorities and preferences (Tavares & Sin, 2018). However, the educational policy of each has been significantly influenced (Carlhed & Sin), 2017; Mikulec, 2018) to obtain best practices, to disseminate knowledge and to implement regional reforms (Papanastasiou, 2019), in the absence of a legal framework which would impose their application in the national area (Vogtle, 2019). National sovereignty has been an obstacle to the implementation of the European agenda (Tavares & Sin, 2018), which includes, among others, the alignment of academic structures, mutual recognition of university qualifications and the design of quality assurance systems in education (Prøitz et al., 2017; Alexiadou & Ronnberg, 2021). Despite expectations, standardization has not reached uniformity within the EU (Brogger, 2018).

In the European area, changes and the influence of higher education have not occurred uniformly. The leading European country in terms of knowledge and competitiveness turns out to be Sweden, followed by Finland and Germany (Šira et al., 2020). In Poland and Denmark, there is a tendency to massify higher education and openness to a growing number of young people, but without a satisfactory quality (Brooks, 2019). In Germany and Spain there is an improvement in the pace of learning, although students are described as vulnerable to technological change and underfunding (Brooks, 2019).

Higher education divides European states into four groups (Kabok *et al.,* 2017). The first consists of developed entities such as Denmark, Sweden, Germany, Austria, Ireland, Spain, the Netherlands, Belgium and France. They prove a high competitiveness in higher education, have results-oriented systems, flexible budgets, institutional autonomy, long-term planning possibilities, and the risks are associated with the overproduction of graduates and the reduction of the quality of higher education. The second group consists of Romania, Hungary, Slovakia and Bulgaria. Their systems are oriented toward freedom in teaching and learning and face difficulties in implementing externally initiated reforms. The third group consists of Cyprus, Croatia, Portugal, the Czech Republic and Italy, countries which have intensively implemented reforms in the field of higher education to improve competitiveness.

The fourth group of countries consists of Malta, Estonia, Greece, Slovenia, Poland, Latvia, Lithuania and Finland, whose systems are results-oriented and measure the performance of higher education.

In developed EU countries, there is a positive contribution of knowledge acquired through education, which is not true in less developed countries, where knowledge does not have a statistically significant influence but rather the quality of education (Mačerinskiene & Aleknaviciute, 2017). The highest quality standards of education are imposed by northern European countries (Alzafari & Ursin, 2019).

In the CEE (Central and East European) states, the process of change has been abrupt and rapid compared to the western states because of political, economic and social transformations starting from the example of developed countries in the region (Dobbins & Kwiek, 2017). Reforms in the higher education sector have taken place in these countries in parallel with the adaptation to the capitalist system, institutional changes and regional integration. This group has encountered difficulties in applying European rules and has shown adaptation problems (Falkner & Treib, 2008). Starting with 2000, the aim was to remove the methods later used in higher education and the Bologna system was implemented. This does not mean that the system has been standardized in the EEC. In contrast, there are big differences among countries, but there has been a transition from elite, bureaucratic and politicized education systems to mass ones, more flexible and less politicized (Dobbins & Kwiek, 2017). Some characteristics of higher education institutions affect the performance of CEE countries, such as the model inherited from the previous period and the underfunding which fuels the phenomenon of academic brain-drain. In ex-communist European states, after the 1990s, the demand for higher education increased due to the wage gap between highly educated and uneducated employees (Kopycka, 2021). Higher education began to be seen as a form of protection against unemployment, which increased the interest of young people in this countries group. They see education not only as an employment and income-raising opportunity but also as a change in their social status. In Poland, for example, the quantitative expansion of the education sector occurred in a period of rapid economic transformations, but students from more modest origins do not have access to high-quality educational programmes, their investments in education are reduced, and in these conditions their opportunities on the labour market are low (Kopycka, 2021). This characteristic can be generalised to all European countries which have gone through a period of transition from a centralisation to a market-specific economy, i.e. the Central and Eastern states.

Analysis of the European Educational Context – Economical Segmentation

The number of higher education graduates has increased, at all three levels, and the accumulation of human capital positively influences economic and personal income growth (Titus, 2009). Education provides society with intellectual capital, productive workforce, skilled managers and visionary leaders (Li, 2020) and has become important for a country's international competitiveness although the highly qualified workforce resulting from the completion of doctoral studies is treated as a cheap resource (Leser *et al.,* 2018). Higher education reduces unemployment and earns higher incomes, especially in northern European countries, but although Europe has been a world-renowned educational center and an incubator for global intelligence, higher education institutions have relaxed requirements in recent decades to align with universities. from Anglo-Saxon countries which dominate the market (Kristic & Pavlovic, 2020). The homogenization of higher education institutions is motivated by the desire to converge to the Anglo-American model under neo-liberal pressure and to create a single European Higher Education Area (Brooks, 2019).

There has been a growing trend in Europe for the number of self-employed graduates, especially among women since the 1990s (Stel van & Zwan van der, 2020). In the developed countries of the region, the self-employed and entrepreneurs in non-agricultural fields have, on average, higher education, and the self-employed in Western European countries have a higher percentage than in the rest of Europe.

In most European countries, graduates without higher education are preferentially employed in sectors other than academia. According to a study by Hnatkova et al. (2022), the academic environment is dominated by people who are pursuing or have completed doctoral studies, although 92 % of them do not remain to practise in this sector and although the transition is difficult. Finding the right job is quite problematic. On the European territory, in 2020, half of the PhD graduates worked in business enterprises, 32.6 % continued their academic career and 11.1 % worked in the government sector. Between 20 % and 49 % of PhD graduates work on the basis of temporary contracts, especially those in the academic environment, 90 % of those from the industrial environment work on the basis of permanent contracts, 50 % are employed in research activities, regardless of the field of activity, the highest weights are registered in Portugal and Poland, and the lowest in Belgium, the Netherlands, Spain and Romania. Between 35 % and 55 % of PhD graduates in Europe are, at least theoretically, overqualified for their current job, which normally only requires a Master's degree or even a Bachelor's degree. Graduates of doctoral studies face challenges in the labour market, the biggest of which is finding a job to match their qualifications and salary expectations. However, participation in a form of higher education is considered the third way to find a good job and the most recommended as long as the first two, graduating from high school and acquiring intermediate qualifications and higher education, respectively, will exert debateable effects in the long term (Carnevale *et al.,* 2018). It seems that the reduced duration of doctoral studies is also associated with the lower quality of placement on the labour market (Abraham *et al.,* 2022).

In the CEE states, income inequalities have decreased because of a disproportionate increase in the distribution at the bottom of the socio-economic segment, the Czech Republic being the country with the lowest level of income inequalities in the region (Magda *et al.,* 2021). However, studies demonstrate the manifestation of an opposite trend in the future, namely the increase of income inequalities in both developed and developing countries (Mdingi & Ho, 2021).

Analysis of the European Educational Context – Gender Inequality

Women's education enables socio-economic gains, and expanding their educational opportunities is an effective way to promote inclusive economic growth (Hong *et al.,* 2019), and gender equality in education contributes to growth, especially in countries under development (Altuzarra *et al.,* 2021). In terms of gender inequality, the percentage of women with a higher education degree is increasing. If globally segregation by field of study is striking, in European countries the percentage of women who obtain a diploma in the field of exact sciences tends to equal that of men (McNally, 2020), so we can say that there is a tendency towards gender equality through access to higher education. Areas such as science, technology, engineering and mathematics were considered less accessible to women, but they absorb a significant percentage of the workforce and provide higher incomes than other fields. The small number of women working in the field of exact sciences is felt as a constraint on European economic growth and is explained by the somewhat discriminatory attitude caused by stereotypes and the hostile environment towards women. Technological changes do not seem to be favourable for women, because the science, technology and engineering science predominantly requires the work of men, and technological development, instead of reducing gender inequality, it fuels it (Silva & Klasen, 2021). In some European countries, such as Croatia, Slovenia, Malta, Poland or Portugal, women are underrepresented in the IT field, and in countries such as the Czech Republic, Croatia, Iceland, Lithuania, Malta, Poland, we meet a high percentage of women without education (Houschildt *et al.,* 2021). Only 32 % of scientists and engineers in Europe are women, and they occupy 15.8 % of managerial leadership positions and 3 % of presidential positions (Millan *et al.,* 2021). If in Europe women earn, on average, 14.1 % less than men, in Spain, for example, the percentage is 11.9 %, inequalities being more pronounced in the private sector compared to the public one (Millan *et al.,* 2021). Also in Italy, women earn 16 % less monthly income compared to men, after 5–6 years of activity on the labour market, differences explained by level of education, occupational characteristics, family situation, an aspect also found in Germany and Sweden which demotivates women in terms of productivity and investment in education (Passaretta & Triventi, 2021).

In the case of higher education, the gender gap is explained by the choices made before entering the higher education system and the level of investment it entails along with characteristics such as native ones, income expectations, confidence, self-efficacy and competitiveness. Women react negatively to competitiveness, although this aspect needs to be discussed according to the culture. In patriarchal societies, women are less competitive compared to those in matrilineal societies. Motivation is different in women compared to men and increases, as does effort, along with age and as education progresses (Hotulainen *et al.,* 2020), but we find a widening of the gender gap in terms of access to higher education in European countries. At levels of higher education, there are not high gender differences, although the percentage of women enrolled in bachelor's and master's studies in Europe differs somewhat among countries, which shows an uneven transition between educational cycles according to gender (Houschildt *et al.,* 2021).

Although educational policies are intended to align with other government policies, it is recommended to improve the organizations from within through good leadership at the level of educational institutions as a starting point for ensuring educational performance (Moller, 2017) and effective implementation of supranational measures in terms of European educational and economic policy. Women have underutilised talents and capabilities so gender equality is fundamental to job creation, increased competitiveness and economic recovery.

Conclusions

The main objective of this research is to study the possibility of reducing European inequality under the influence of higher education, on its three levels (Bachelor`s degree, Master`s degree and Doctoral degree - or equivalent) and economic growth. For this purpose, we applied a panel methodology to 19 European countries. The validity of the statistical data determined us to design two models. Empirical analysis shows, according to the first model, that European inequalities are reduced because of access to higher education conditioned by relative gender equality for the first and third cycles of the higher education system. In the second cycle, gender conditioning has no explanatory power. According to the second model, the increase in the number of higher education graduates accentuates European inequalities, and women remain a socially vulnerable category. As for the influence of economic growth, the results are antagonistic. The process may exacerbate or reduce inequalities depending on third factors, in particular economic policy measures specific to each European country. The increase contributes to the reduction in the number of graduates in the European education system, while the accentuation of inequalities is positively correlated with the number of holders of a Bachelor's and Master's degree and negatively correlated with the number of holders of a Doctoral degree. Gender analysis shows that relatively equal access for women and men to the first and third cycles of higher education tends to reduce European inequalities. Women continue to occupy a vulnerable position in some societies because the culture is very diverse on the territory of the EU and has a strong economic and social impact.

The study confirms the results obtained by Breen & Chung (2015), Coady & Dizioli (2018), Lee & Lee (2018), Hall (2018), Lee & Vu (2020) regarding the relationship between education and income inequality and those obtained by Glodowska (2017), Jones et al. (2017), Mačerinskiene & Aleknaviciute (2017), Pastor et al. (2017), Garcia-Alvarez-Coque et al. (2019) on the relationship between education and growth.

The uneven income distribution is characteristic to of many countries, mainly due to globalization, technological change and institutional quality (Hall, 2018), and the expansion of education is an important factor in reducing educational inequalities and, consequently, income inequality (Lee & Lee, 2018).

There is no uniformity between European states in terms of the higher education system. The states in the EEC region appear slightly redundant even though they adopted the Bologna system. The reason is the legacy of the previous period and underfunding, which, according to Dobbins & Kwiek (2017), stimulates the academic brain-drain phenomenon. Improving the performance of education is a difficult task to achieve, so there is a need for collaboration between government decision-makers and the leaders of higher education institutions to effectively invest the resources needed to generate professional, educational and economic development and efficiency (Moller, 2017).

The main limitation of the study is the lack of statistical data for a long time and for all European countries. We excluded seven states from the analysis, and the rest was divided into two numerically unequal groups based on the criterion of data validity over certain time periods. Each group was suited to a different variant of the panel methodology. Although the application of Fixed Effects and Random Effects is a limitation, the results found lead to different but explainable conclusions which draw attention to the need to quantitatively evaluate the access to higher education through the effects of inequalities, but also to qualitatively evaluate women`s the vulnerability on the labour market. We consider that the results of one model confirm those of the other. Another limitation refers to the fact that we do not evaluate the qualitative contribution of higher education in the absence of indicators suitable for such an analysis.

With the exception of the contribution to the literature, the results provide an inspiring theoretical framework for economic policy makers because higher education is a factor in reducing European inequalities and competitiveness through the economic and social effects they generate as long as the number of graduates does not accentuate socio-economic inequalities, and gender equality regarding access to education translates into gender equality on the labour market.

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