

## The Impact of Social, Economic and Gender Inequality on Prosperity in the European Union Countries

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### ABSTRACT

**Purpose:** This paper aims to examine the link between the three types of inequality in society and reveal the factors that contribute most to enhancing the prosperity of European Union countries and regions.

**Methodology/Approach:** The first part of the analysis is using correlation matrices to reveal the links between the different forms of inequality. The following parts employ Ordinary least squares models to estimate the significant factors promoting prosperity in countries.

**Findings:** We find a strong positive correlation between European Union countries' prosperity and gender and social equality. There is also a strong positive correlation between social and gender equality. In contrast, only a very weak negative relationship is shown between economic inequality characterised by the Gini coefficient and prosperity. It turned out, that prosperity has been shown to be strongly impacted by the population's education. However, also women's representation in top politics enhances prosperity.

**Research Limitation/Implication:** The scope of the analysis in terms of available data was limited, particularly when examining the determinants of prosperity at the regional level. Data for analysed variables were not available for all European Union regions.

**Originality/Value of paper:** The article not only focuses on a particular type of inequality but examines the relationship between economic, gender and social inequality. It offers insights into their interconnectedness, which allows a better understanding of the impact of inequality on society and a country's prosperity.

**Category:** Research paper

**Keywords:** prosperity; quality of life; social inequality; gender inequality; economic inequality

## 1 INTRODUCTION

Equality is one of the critical conditions essential for ensuring an efficiently functioning and prosperous economy, as it is involved in creating institutions and policies that foster innovation in societies and increase countries' economic capacity as a top priority (ECLAC, 2018).

There is ample evidence in the literature that the prosperity of countries, their economic performance, or the well-being of their populations is linked to the degree of inequality in society. As a result of persistent inequality, social cohesion is weakened (Van De Werfhorst and Salverda, 2012). In the literature, authors largely focus on examining the impact of one type of inequality on the prosperity of society. However, their results reveal the impact of different factors on the level of prosperity in a country. For example, Hanushek and Wößmann (2010) discuss the positive impact of both quality and quantity (Cooray, 2009) education on countries' economic growth. Increasing social trust (Mularska-Kucharek and Brzezunski, 2016), promoting women's representation in the labour market and reducing the gender wage gap also positively impact building a prosperous society (EIGE, 2016, 2017). On the contrary, persistent corruption in society harms the economic prosperity of countries (Gründler and Potrafke, 2019) and lowers the level of human capital (Mo, 2001). In some cases, such as income inequality, authors' opinions differ on its impact on countries' economic growth and well-being (Schneider, 2016; Mo, 2000; Shin, 2012). Based on the literature review, we can see that inequalities persist in different areas of society. Is it possible to eliminate them entirely?

Obviously, full equality cannot be achieved (Blackburn, 2008), but this does not mean that efforts should not be made to mitigate it. Therefore, exploring different forms of inequality helps to understand better the impact of inequality on society and individuals (Binelli, Loveless and Whitefield, 2015).

This is one of the reasons why we aim to analyse the impact of multiple forms of inequality on a country's prosperity. We aim to find out how economic, social, and gender inequality are interrelated and what impact the different forms of inequality have on a country's economic performance, well-being and prosperity. The factors that characterise the three main types of inequality are identified, and their impact on the national and regional level of prosperity is explored.

## 2 IS INEQUALITY REALLY NECESSARY?

Looking at prosperity through the lens of rising Gross Domestic Product (GDP) with unchanged levels of inequality, everyone can be positively affected by this state of affairs. Conversely, rising economic inequality leads to a widening gap between the mean and the median, i.e., between what is changing at the country level and what is happening to individuals (Stiglitz, 2012).

Easterly (2007) and several others advocate a negative relationship between inequality and economic prosperity as expressed by economic growth. From a different perspective (e.g. Barro, 2000), inequality in developing countries hinders economic growth, while in developed countries, it promotes it; but at the same time, this relationship does not explain the differences in inequality that occur over time or within countries. Castells-Quitano and Ruel (2017) advocate that if growth-promoting incentives accompany inequality, it can benefit a country's prosperity. Even, some authors argue that inequality is necessary for growth, as people with the highest incomes are perceived as job creators. However, job creation occurs across the full range of income distribution, depending on current demand. Another argument supporting inequality is the trickle-down theory, which assumes that inequality is necessary for growth and helps accumulate savings, but this argument is less present today. On the contrary, a strong argument supports the negative impact of inequality on prosperity. Namely, in countries with persistently high levels of inequality, the population does not reach its full potential, negatively affecting its future opportunities and related economic growth (Stiglitz, 2015).

The development of economic inequality may be moving in the opposite direction to other types of inequality (e.g. social, gender, ethnic, educational). It is, therefore, interesting and desirable to focus on the plurality of inequalities. The relationships between the different types of inequalities may be different. They can reinforce or undermine each other (Van De Werfhorst and Salverda, 2012). Different forms of inequality may be linked to some extent, but a decline in one type of inequality may not ensure a decline in other forms of inequality. This idea is echoed by Seguino (2005), who adds that, for example, ethnic, gender or class inequality may have different effects on prosperity since they affect the desired outcome through different pathways. The following subsections look closely at the various forms of inequalities.

## **2.1 Economic Inequality**

Economic inequality means that economic resources are not equally distributed among individuals in a society (Paulus, 2004). It is associated with income inequality, wealth distribution, employment and human capital. If we focus on income inequality in the context of economic inequality, the latter negatively affects the well-being and political engagement of individuals and households, among which disparities are widening (Van De Werfhorst and Salverda, 2012). In societies where significant income disparities persist, we observe a higher incidence of multiple forms of adverse social outcomes that disadvantage a given group in society (Hudec and Urbančíková, 2007; Pickett and Wilkinson, 2015). Income inequality is perceived as a factor that slows down economic growth. Growing social discontent among citizens gives way to problems disrupting political stability in the country and leads to social inequalities (Ortiz and Cummins, 2011). Among other things, it increases the rigidity of economic institutions while being bound by social norms in society. Analysing the sources

of economic inequality and its possible consequences allows for a better grasp of economic and social development (Paulus, 2004). The standard and one of the most commonly used indicators of income inequality is the Gini coefficient.

## **2.2 Social Inequality**

Social inequality is characterised as unequal distribution or access to essential material goods, which can be both material and non-material. They manifest themselves as advantages or disadvantages for those social groups affected. They are manifested not only in living conditions but also in opportunities and affect the outcomes of individuals and groups. Structural inequalities also raise the question of their inevitability. According to the authors, however, it depends on its origin. It can be eliminated if social inequality is conscious and arises from conscious action. However, the problem of its elimination is more pronounced if the inequality is part of the nature of the individual or the conditions created in the group (Hurst, Gibbon and Nurse, 2016).

Social inequalities consist of two components. The first is the social, economic or institutional processes by which certain goods are perceived as highly valuable. The second component is the rules of access and allocation of this group of goods (Suter, 2014). The determinants of social inequality are diverse, based on criteria that reflect their degree of relevance. What remains clear, however, is the division between those who lose and those who gain as a result of the persistence of this inequality. At the same time, however, these are not always the same people (Blackburn, 2008). According to Binelli, Loveless and Whitefield (2015, p.239), social inequality remains a complex and vague concept to grasp, but it is seen as “a measure of differences along a set of certain dimensions in actual achievement and expected outcomes”. It is a concept consisting of multiple dimensions that are highly relevant to life in society. In addition to education and health, social inequality also includes inequality within income levels themselves. The authors have created an index that views social inequality as a concept comprising the above three separate types of inequality while being interested in actual and future outcomes. They examined social inequality in Eastern and Central European countries and found that countries with lower social inequality are politically more stable, economically more productive, and characterised by higher levels of human development. However, in other studies, social equality is mainly associated with health (e.g. Power, 1994; Dahl and Malmberg-Heimonen, 2010; Dahl, 1993) and education (e.g. Lewis, 2007; Boudon, 1974; Freitag and Schlicht, 2009; Hillmert, 2013 and others) and income inequality is considered as a part of economic inequality.

## **2.3 Gender Inequality**

Gender inequality in the labour market and education, among other things, negatively affects countries' economic growth (OECD, 2012). Gender inequality in education seriously reduces the quality of human capital (Klasen, 2000). These

ideas are supported by the European Council, which recognises that policies promoting gender equality are essential for a country's economic growth, competitiveness and prosperity (Council of the European Union, 2006). Thus, countries whose policies promote women's equality have higher GDP per capita growth rates. At the same time, however, in countries where solid religious beliefs persist, gender stereotypes are more robust, which may translate into economic practices and consequently cause a slowdown in economic growth (Moorhouse, 2017). In countries with higher representation of women in parliament, we observe lower rates of corruption, which has been shown not only at the national (Dollar, Fisman and Gatti, 2001) but also at the regional level (Jha and Sarangi, 2018). At the same time, gender equality in the country is one of the fundamental and most important pillars of an environment that fosters innovation. Gender equality is not only a matter of ethics but also promotes economic efficiency (Ege and Ege, 2019).

Hence, gender inequality can be viewed from two perspectives, either in terms of how it changes over a person's lifetime or in terms of how it is defined by multiple domains of life, such as work, education, income, and health care (Salvini, 2014). Comprehensively, gender inequality in a country is measured through indices such as the Gender Inequality Index (GII), the Gender Equality Index (GEI), the Global Gender Gap Report (GGGR) or the Gender Development Index (GDI). At the regional level, the Female Disadvantage Index (FemDI) and the Female Achievement Index (FemAI) are available.

### **3 COUNTRY PROSPERITY MEASUREMENT TOOLS**

GDP is used as a benchmark to measure a country's prosperity, growth or progress (Bate, 2009). GDP is a very useful indicator when measuring market output, but its use is occasionally also associated with measuring social progress and societal well-being (Eurostat, 2020). In the context of GDP, there is a discussion of the so-called Life Satisfaction Paradox since, despite the economic growth observed in developed countries, life satisfaction in these countries has not changed significantly over several decades (Badea and Pociovălișteanu, 2011).

Walker and Jackson (2019) consider that as income increases, marginal returns to income decrease, creating room for prioritising other factors in determining well-being. The failure to take non-monetary aspects into account is seen as one of the main drawbacks of measuring GDP prosperity. The most prosperous countries need not be exclusively those with the highest GDP per capita ratio. Instead, the well-being and welfare of the population should characterise the prosperity of the country (Bate, 2009). The situation of households is better reflected by other indicators than GDP per capita, focusing on measuring the consumption or income of citizens. Citizens' incomes often evolve differently from real GDP, thus offering the possibility of a different insight into citizens' well-being. Moreover, social or environmental progress does not condition economic

progress (Eurostat, 2020). To shed light on approaches to measuring prosperity and well-being, the following Table 1 provides an overview of the indicators used.

*Table 1 – Prosperity and well-being Indexes (Own elaboration according to UNDP, Legatum Institute, OECD, European Commission, Eurostat)*

<b>Title</b>	<b>Description</b>	<b>Created by</b>	<b>Dimensions and indicators</b>
Human Development Index	The index aims to demonstrate that the tool for assessing development should not only be economic growth but people and their capabilities.	UNDP	<ol style="list-style-type: none"> <li>1. Long and healthy life (Life expectancy at birth)</li> <li>2. Knowledge (Expected years of schooling, mean years of schooling)</li> <li>3. A decent standard of living (GNI per capita)</li> </ol>
Legatum Prosperity Index	The index shows the economic and social well-being of countries. It is made up of 12 pillars of prosperity that fall into one of three areas: empowering people, open economies and inclusive societies.	Legatum Institute	<ol style="list-style-type: none"> <li>1. Safety &amp; Security</li> <li>2. Personal Freedom</li> <li>3. Governance pillar</li> <li>4. Social Capital</li> <li>5. Investment Environment</li> <li>6. Enterprise Conditions</li> <li>7. Infrastructure &amp; Market Access</li> <li>8. Economic Quality</li> <li>9. Living Conditions</li> <li>10. Health</li> <li>11. Education</li> <li>12. Natural Environment</li> </ol>
Better Life Index	The index aims to measure the well-being of society by tracking the development of 11 areas that are important for the population's life.	OECD	<ol style="list-style-type: none"> <li>1. Housing</li> <li>2. Income</li> <li>3. Jobs</li> <li>4. Community</li> <li>5. Education</li> <li>6. Environment</li> <li>7. Governance</li> <li>8. Health,</li> <li>9. Life Satisfaction</li> <li>10. Safety</li> <li>11. Work-Life Balance</li> </ol>
European Social Progress Index	The index aims to measure social progress in EU regions, complementing traditional measures of economic progress. Social progress is measured through 12 dimensions, each of which falls into one of the three areas of basic human needs, foundations of well-being and opportunity.	European Commission	<ol style="list-style-type: none"> <li>1. Nutrition and basic medical care</li> <li>2. Water and sanitation</li> <li>3. Shelter</li> <li>4. Personal security</li> <li>5. Access to basic knowledge</li> <li>6. Access to information and communication</li> <li>7. Health and wellness</li> <li>8. Environmental quality</li> <li>9. Personal rights</li> <li>10. Personal freedom of choice</li> <li>11. Tolerance and inclusion</li> <li>12. Access to advanced education</li> </ol>

Title	Description	Created by	Dimensions and indicators
Quality of Life dimensions	The index aims to complement the results provided by the measurement of GDP as an indicator of well-being and quality of life.	Eurostat	<ol style="list-style-type: none"> <li>1. Material living conditions</li> <li>2. Productive or main activity</li> <li>3. Health</li> <li>4. Education</li> <li>5. Leisure and social interactions</li> <li>6. Economic security and physical safety</li> <li>7. Governance and basic rights</li> <li>8. Natural and living environment + overall experience of life</li> </ol>

#### 4 METHODOLOGY

One of the main objectives of this paper is to analyse the impact of inequality in EU countries, particularly gender diversity, on a country's prosperity. In doing so, three types of inequality will be analysed: social, economic and gender inequality. We first try to examine the relationship between different types of inequality themselves and, subsequently, between these inequalities and prosperity. Hence, we are interested in whether the different types of inequalities influence each other, the relationships between the selected types of inequalities, and how they affect the very development of prosperity in a country. The idea is supported by the work of other authors, such as Binelli, Loveless and Whitefield (2015), who also find it relevant to examine multiple types of inequality simultaneously, allowing for a better understanding of the impact of inequality on society. Van De Werfhorst and Salverda (2012) similarly emphasise the need to explore the diverse inequalities to help reveal interrelationships.

The interrelationship of these forms of inequality will be examined using correlation matrices and correlation diagrams. Gender inequality in the correlation matrix is represented by the GEI, economic inequality by the Gini coefficient of income inequality, and social inequality by the Social Progress Index (SPI). At the same time, we express well-being itself by three indicators. The first is GDP per capita, as the most widely used measure of prosperity, but with reservations; followed by the Legatum Prosperity Index (LPI), used to measure a country's prosperity (e.g., Gligorić Matić, Gavrilović, Stanišić, 2020; Kabakci Günay and Sülün, 2021; Timmerman, 2016); and the third is the Human Development Index (HDI), which assesses social progress (e.g., Grubauch, 2015; Kaur, Kaur and Soni, 2022; Ortega, 2014). The structure of the prosperity indices is quite different, they consider different spheres of life, and their results may differ.

The basic framework of the relationship between types of inequality and prosperity enables to proceed to the main research question:

*Which kinds of inequalities affect higher prosperity of a country/region – economic, social or gender?*

The Ordinary Least Square model (OLS) is used, with each of the three types of inequality represented by four variables. The impact of 12 variables on a country's prosperity is examined, with prosperity proxied in three different ways: a) GDP per capita, b) LPI, and c) HDI. A similar approach is applied to the NUTS II regions of the EU, giving a finer scale of perspective, while at the same time, there are no such large differences in the size of the territorial units. On the other hand, the availability of data is lower, and although the model of regions works with the same structure of effects of variables representing the three types of inequality, the number of factors is only eight. The impact of inequality factors on the GDP per capita of the regions is examined using OLS method.

#### **4.1 Factors of Inequality Affecting the Prosperity: EU Countries**

The second part further identifies the determinants that affect the level of prosperity in EU countries. In selecting indicators, we have drawn on the dimensions of several approaches to measuring prosperity outlined in the previous section. At the same time, we extended the analysed variables with the Gini coefficient, which is perceived as a standard and one of the most commonly used indicators of income inequality in countries (OECD, 2011). The indicators falling under gender inequality were drawn from Eurostat and the European Institute for Gender Equality Database. We divided the indicators of quality of life dimensions into two groups, economic and social. In selecting the variables, we relied on previous research and indices measuring a country's prosperity, progress, or well-being. Thus, we obtained factors that are considered key in promoting a country's prosperity and development.

In the group of indicators belonging to economic inequality, we include Eurostat's quality of life dimensions, where not only income indicators but also indicators of material inequality (material living conditions) are examined, and we also include the long-term unemployment rate, which has an impact on the economic well-being of the individual. Spatial inequality, which is usually expressed as regional disparities, does not enter the models (Samson et al., 2001).

The choice of indicators of social inequality is based on the literature, where social prosperity is mainly associated with a healthy population and access to education, but also security, which contributes to the prosperity of both the population and the country. The link between the need for security and crime rates and quality of life is particularly accentuated in poorer countries (Franc, Prizmic-Larsen and Lipovčan, 2012).

The last form of inequality we address in this paper is gender inequality. Surprisingly (Bjørnskov, Dreher and Fischer, 2008), well-being economists rarely include gender equality. Despite long-standing efforts to promote gender equality in EU countries, gender pay gaps are still present, and although the situation has been improving over the years, the observed progress has been plodding. A similar trend is observed in labour market participation, where, moreover, gender occupational segregation persists (Barbieri et al., 2021). The

persistent gaps may jeopardise the overall economic prosperity, as low wages act as a disincentive, which may result in a reduction of women's labour market participation but may also affect the interest in investing in further education and thus human capital development (Ciminelli, Schwellnus and Stadler, 2021). The participation of men and women in paid employment contributes to reducing poverty, increasing social inclusion and the growth of prosperity in a country (Marx, 2013). This justifies the inclusion indicators of the wage and employment gap but also the representation of women in high managerial positions as well as in politics, which helps to zoom in on the horizontal and vertical segregation in society. Table 2 lists the variables, their units of measurement and their anticipated impact on the country's prosperity.

*Table 2 – List of Variables Used in the Model and Their Influence on the Dependent Variable*

Variable		Abbreviation	Unit of measure	Expected impact	Source
Prosperity (dependent variable)	GDP per capita	GDP	Units of national currency per capita	X	Eurostat
	Legatum Prosperity Index	LPI	Scale 0-100	X	Legatum Institute
	Human Development Index	HDI	Scale 0-1	X	UNDP
Economic inequality (independent variables)	Gini coefficient	gini	Scale 0-100	–	Eurostat
	Inability to make ends meet	inability make ends needs	%	–	Eurostat
	Long-term unemployment	long term unemployment	%	–	Eurostat
	Inability to face unexpected financial expenses	inability unexpect expenses	%	–	Eurostat
Social inequality (independent variables)	Healthy life years	Healthy life	Years	+	Eurostat
	Early leavers from education and training	ELET	%	–	Eurostat
	Crime, violence or vandalism in the area	crime	%	–	Eurostat
	Participation rate in education and training (last 4 weeks)	edu training	%	+	Eurostat

Variable		Abbreviation	Unit of measure	Expected impact	Source
Gender inequality (independent variables)	Gender employment gap	employment gap	%	–	EIGE
	Gender pay gap in unadjusted form	pay gap	%	–	EIGE
	Women in national government	w government	%	+	Eurostat
	Women board members	w board members	%	+	EIGE

Notes: X is no impact; + is positive impact, – is negative impact.

The OLS model is used to estimate the coefficients of the linear regression equations that describe the relationship between the 12 variables representing the type of inequality and the dependent variable of EU countries' prosperity. Panel data mapping the 27 countries of the EU for the period 2011-2020 (GDP and LPI model) and 2011-2019 (HDI model) are used. To avoid possible bias in the results, the assumption of normality (Jarque-Bera normality test), model specification (Bayesian information criterion), autocorrelation (Breusch-Godfrey test) as well as heteroscedasticity (Breusch-Pagan test) were tested. Multicollinearity was tested using the variance inflation factor. The statistical significance of the model was verified using the F-test for statistical significance at the significance level  $\alpha = 0.05$ .

After verifying the above assumptions, we can interpret the results of the OLS method for each of three dependent variables of prosperity: a) GDP per capita (eq.1), b) LPI (eq. 2) and c) HDI (eq. 3):

$$\begin{aligned}
 GDP = & \beta_0 + \beta_1 \text{edu training} \\
 & + \beta_2 \text{inability make ends needs} \\
 & + \beta_3 \text{inability unexpected expenses} \\
 & + \beta_4 \text{w government} \\
 & + \beta_5 \text{long term unemployment} + \beta_6 \text{gini} \\
 & + \beta_7 \text{w board members} + \beta_8 \text{pay gap} \\
 & + \beta_9 \text{employment gap} + \beta_{10} \text{ELET} \\
 & + \beta_{11} \text{healthy life} + \beta_{12} \text{crime} + u_{ti}
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 LPI = & \beta_0 + \beta_1 \text{edu training} \\
 & + \beta_2 \text{inability make ends needs} \\
 & + \beta_3 \text{inability unexpected expenses} \\
 & + \beta_4 \text{w government} \\
 & + \beta_5 \text{long term unemployment} + \beta_6 \text{gini} \\
 & + \beta_7 \text{w board members} + \beta_8 \text{pay gap} \\
 & + \beta_9 \text{employment gap} + \beta_{10} \text{ELET} \\
 & + \beta_{11} \text{healthy life} + \beta_{12} \text{crime} + u_{ti}
 \end{aligned} \tag{2}$$

$$\begin{aligned}
HDI = & \beta_0 + \beta_1 \text{edu training} \\
& + \beta_2 \text{inability make ends needs} \\
& + \beta_3 \text{inability unexpected expenses} \\
& + \beta_4 \text{w government} \\
& + \beta_5 \text{long term unemployment} + \beta_6 \text{gini} \\
& + \beta_7 \text{w board members} + \beta_8 \text{pay gap} \\
& + \beta_9 \text{employment gap} + \beta_{10} \text{ELET} \\
& + \beta_{11} \text{healthy life} + \beta_{12} \text{crime} + u_{ti}
\end{aligned} \tag{3}$$

## 4.2 Factors of Inequality Affecting the Prosperity: EU Regions

The third part aims at investigating the factors influencing prosperity at the regional level, the number of NUTS II regions is 235. Again, the indicators are classified into three groups of inequality – economic, social and gender. The impact of the factors on prosperity in terms of GDP per capita is examined. The downside is that some data, namely on *long term unemployment*, *poverty and social exclusion*, were incomplete. We preferred to keep all regions with this limitation in the model. Table 3 lists all the indicators examined, the units of measurement, and the expected impact of these variables on countries' prosperity.

Table 3 – List of Variables Used in the Model and Their Influence on the Dependent Variable

	Variable	Abbreviation	Unit of measure	Expected impact	Source
Prosperity (dependent variable)	GDP per capita	GDP	Units of national currency per capita	X	Eurostat
Economic inequality (independent variables)	Persons at risk of poverty or social exclusion	poverty soc exclusion	%	–	Eurostat
	Long-term unemployment	long term unemployment	%	–	Eurostat
Social inequality (independent variables)	Life expectancy	life expectancy	Years	+	Eurostat
	Early leavers from education and training	ELET	%	–	Eurostat
	Participation rate in education and training (last 4 weeks)	edu training	%	+	Eurostat
Gender inequality (independent variables)	Women employment	w employment	%	+	Eurostat
	Female achievement index	FemAI	Scale 0-100	+	European Commission
	Female disadvantage index	FemDI	Scale 0-100	–	European Commission

Notes: X is no impact; + is positive impact, – is negative impact.

As with the national-level models, the relevant inequality factors in relation to the prosperity of EU regions are determined using the OLS model. The regression equation has the following form (eq. 4):

$$\begin{aligned} GDP = & \beta_0 + \beta_1 FemAI + \beta_2 FemDI + \beta_3 w \text{ employment} \\ & + \beta_4 \text{life expectancy} + \beta_5 \text{edu training} \\ & + \beta_6 ELET + \beta_7 \text{long term unemployment} \\ & + \beta_8 \text{poverty soc exclusion} + u_i \end{aligned} \quad (4)$$

## 5 RESULTS

The models for both EU countries and regions are tested and verified, and this section provides the results of the models with respect to the main research question, which types of inequality best explain a prosperous country or region.

### 5.1 The Relationship between Inequality and Prosperity and the Relationships between Different Forms of Inequality and Each Other

The relationship between the three types of inequality, social, economic and gender, is examined by correlation coefficients and illustrated by correlation diagrams. As can be seen in Figures 1 and Figure 2, there is a strong positive correlation between GDP per capita, which represents prosperity and social (0.72) and gender equality (0.70). On the contrary, the correlation between the Gini coefficient and GDP per capita is only very low (-0.21). Gender and economic inequality yield a similar result (-0.21). However, when prosperity is measured by a non-monetary indicator (prosperity index (-0.35) or development (-0.45)), a moderate negative correlation with the Gini coefficient becomes apparent.

The figures display the default GDP per capita problem for Luxembourg (small city-state) and Ireland (presence of multinationals), which spoil otherwise encouraging correlations. Countries with higher gender equality are more prosperous, and there is also a positive relationship between the SPI and prosperity. It can be concluded that GDP growth, gender equality and social development are interrelated and mutually influencing.

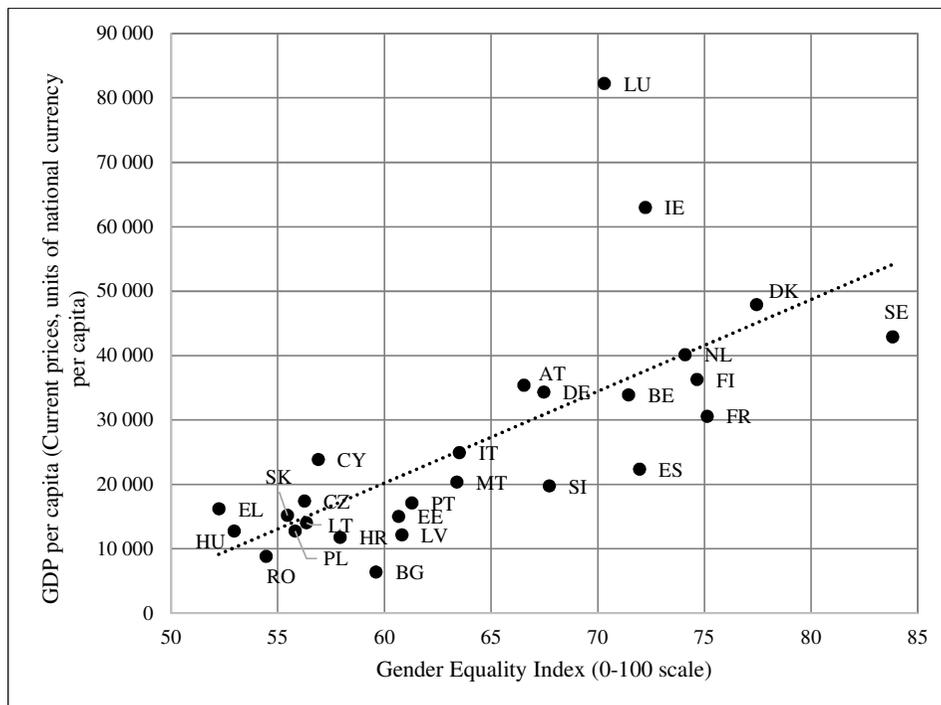


Figure 1 – GDP per Capita Vs Gender Equality Index

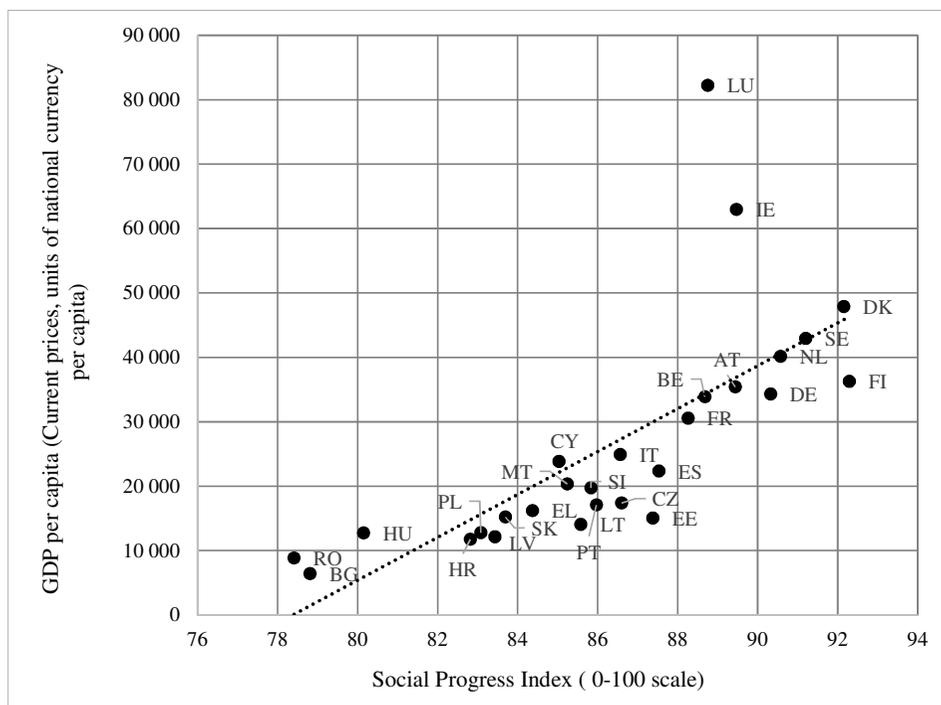


Figure 2 – GDP per Capita Vs Social Progress Index

Next, the bilateral relationships between economic, social and gender inequality are visible in the correlation matrix. As Table 4 indicates, gender inequality is strongly positively correlated with social inequality, as expressed by the SPI. However, economic inequality has a different pattern than social and gender inequality.

Table 4 – Correlation Matrix

	GEI	SPI	GINI
GEI	1		
SPI	0.81	1	
GINI	-0.21	-0.38	1

Notes: GEI – Gender Equality Index; SPI – Social Progress Index; GINI – Gini Coefficient.

## 5.2 The Relationship between National Prosperity and Inequality

The three OLS models have the same variables in the three groups of inequalities: economic, gender and social; they differ in the dependent variable of prosperity:

- Model 1: GDP per capita
- Model 2: LPI
- Model 3: SPI

Model 1: Due to the higher value of the inflation factor (5.53), suggesting multicollinearity, the variable *inability make ends needs* has been removed. Still, HAC correction had to be applied to solve the problem with heteroscedasticity and autocorrelation. The adjusted model did not have a normal distribution. The model with heteroscedasticity and autocorrelation problem showed six statistically significant variables, after adjusting the model, the statistically significant variable is *edu training*.

The GDP per capita of EU countries is most affected by the variable *edu training* and there is a positive relationship between education and prosperity (eq. 5):

$$\begin{aligned}
 GDP = & 32,567.71 + 854.3 \textit{ edu training} \\
 & - 433.07 \textit{ inability unexpected expenses} \\
 & + 64.65 \textit{ w government} \\
 & - 298.09 \textit{ long term unemployment} + 21.21 \textit{ gini} \\
 & + 279.88 \textit{ healthy life} \\
 & - 211.78 \textit{ w board members} - 705.12 \textit{ ELET} \\
 & - 732.47 \textit{ pay gap} + 547.2 \textit{ crime} \\
 & - 347.1 \textit{ employment gap}
 \end{aligned} \tag{5}$$

Model 2: Considering the LPI as the dependent variable, we solved the model's multicollinearity problem by removing the variable *inability make end needs*.

The final model did not have a normal distribution, and we removed its heteroscedasticity and autocorrelation problem by using the HAC correction. After model adjustment, three variables are statistically significant; the *edu training* variable, female representation in government and *long term unemployment*. Thus, it demonstrates that national prosperity is affected by all three forms of inequality.

Also, the factor of education (*edu training*) turned out to be the most critical and significant, however, higher women representation in government and lower *long term unemployment* contributes to greater prosperity (eq. 6):

$$\begin{aligned}
 LPI = & 67.59 + 0.32 \text{ edu training} \\
 & - 0.10 \text{ inability unexpected expenses} \\
 & + 0.16 \text{ w government} \\
 & - 0.21 \text{ long term unemployment} - 0.13 \text{ gini} \\
 & - 0.03 \text{ w board members} + 0.11 \text{ pay gap} \\
 & - 0.01 \text{ employmentap} - 0.095 \text{ ELET} \\
 & + 0.11932 \text{ healthy life} - 0.012 \text{ crime}
 \end{aligned} \quad (6)$$

Model 3: The HDI as a dependent variable of prosperity has proven to fulfil all the model requirements except for multicollinearity, heteroscedasticity and autocorrelation. Also, the Bayesian information criterion indicated the best fit of the model with ten variables. The final model did not include the variables *crime* and *inability make ends needs*. We report the final equation below (eq. 7):

$$\begin{aligned}
 HDI = & 0.80 + 1.2e^{-3} \text{ edu training} \\
 & - 4.85e^{-4} \text{ inability unexpected expenses} \\
 & + 1.46e^{-3} \text{ w government} - 1.199e^{-3} \text{ gini} \\
 & + 9.46e^{-5} \text{ w board members} \\
 & - 5.10e^{-4} \text{ long term unemployment} \\
 & - 2.05e^{-3} \text{ ELET} + 1.44e^{-3} \text{ healthy life} \\
 & + 6.55e^{-4} \text{ pay gap} + 8.9e^{-4} \text{ employment gap}
 \end{aligned} \quad (7)$$

In the third model, education (early leavers from education and training) appeared as an expected variable negatively affecting HDI. In contrast, increasing women's representation in government positively affects a country's prosperity, measured by the HDI.

### 5.3 Prosperity and Inequality in EU Regions

Several types of inequalities – economic, social or gender, could also explain prosperity in the territorial units of regions. However, data availability is less than adequate, and the data may not fulfil the requirements of the OLS model. Indeed, research had to be limited only to GDP per capita as a proxy of prosperity. The model did not have a normal distribution, variable FemAI showed a higher value of multicollinearity and had to be removed. The

autocorrelation problem has been removed by the Cochrane Orcutt method, and the final regression equation is (eq. 8):

$$\begin{aligned}
 GDP = & -87,565.25 + 1,084.36 \text{ edu training} \\
 & + 1,440.53 \text{ life expectancy} - 152.95 \text{ FemDI} \\
 & - 393.61 \text{ long term unemployment} \\
 & - 235.56 \text{ poverty soc exclusion} - 160.26 \text{ ELET} \\
 & + 6.37 \text{ w employment}
 \end{aligned} \tag{8}$$

The most significant positive impact has shown education and life expectancy, both variables belonging to the social inequality domain. At the same time, the variables *poverty soc exclusion* and *w employment* are statistically significant. In the regional model, we confirmed the impact of all forms of inequality on the countries' prosperity.

## 6 CONCLUSION

Countries focus primarily on their growth and development. The relationship between economic inequality and growth is still an open question. However, it is clear that too much inequality generates social problems whilst also reflecting the untapped capital of segregated groups in society. Greater levels of equality – regional, income, social and gender – are only partly in the foreground as themes worth tackling if society has sufficient resources.

Nevertheless, working to reduce inequalities and promote inclusion could ultimately contribute to the growth and development of a country or region. Therefore, this paper examines the impact of three forms of inequality in society and their impact on a country's prosperity. At the same time, it poses the innovative question of how inequalities are related across countries – whether they have similar patterns or are eventually inversely related.

There are several approaches to measuring prosperity, the most straightforward being GDP per capita, concentrating too much on economic growth and less on other aspects of prosperity. While its relation to forms of inequality is not shown to be significant, its correlation diagram indicates that the problem lies more with GDP outliers that distort an otherwise linear relationship.

OLS models have shown which factors mirroring inequality are related to the prosperity of a country or region. Income inequality correlates only weakly to gender inequality. In particular, social and gender equality share a strong relationship. If countries and regions want to achieve greater prosperity, acting on greater inequality is proving to be the right path. In doing so, the synergistic factors point to the importance of access to higher education, health care and the promotion of healthy lifestyles to achieve higher life expectancy. The models demonstrate the importance of higher representation of women in government positions and closing the pay gap, contributing to feelings of security and

participation. Whether at the national or regional level, gender equality variables are consistently significant in the models.

Perhaps the one surprising finding was that income inequality, as expressed by the Gini coefficient, was statistically insignificant for all three national models. This would suggest different paths to prosperity under different conditions of economic inequality. Hence, further research could focus on narrower groupings of countries and analyse whether the factors of prosperity in Eastern and Central European countries differ from those in Western Europe.

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## CONFLICTS OF INTEREST

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.



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