

# *Athens Journal of Mediterranean Studies*



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## Front Pages

GREGORY T. PAPANIKOS

### Regional Effects of the Great Recession on Greek Unemployment Rates: A Graphical Analysis

M<sup>a</sup> JESÚS ARROYO FERNÁNDEZ, MARÍA-CARMEN GARCÍA-  
CENTENO, INMACULADA HURTADO OCAÑA &  
PEDRO FERNÁNDEZ SÁNCHEZ

### GREECE vs. SPAIN: Similarities and Differences in the Evolution of Unemployment in the 21<sup>st</sup> Century

HAMED ABDELREHEEM EAD

### Historical Perspectives on Disability in Egypt: Attitudes and Policies

FELICE VINCI

### A Hypothesis on the Original Meaning of Samson's Hair

# Athens Journal of Mediterranean Studies

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\*\*\*\*\*

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<b><u>Front Pages</u></b>	i-x
<b><u>Regional Effects of the Great Recession on Greek Unemployment Rates: A Graphical Analysis</u></b> <i>Gregory T. Papanikos</i>	81
<b><u>GREECE vs. SPAIN: Similarities and Differences in the Evolution of Unemployment in the 21<sup>st</sup> Century</u></b> <i>M<sup>a</sup> Jesús Arroyo Fernández, María-Carmen García-Centeno, Inmaculada Hurtado Ocaña &amp; Pedro Fernández Sánchez</i>	95
<b><u>Historical Perspectives on Disability in Egypt: Attitudes and Policies</u></b> <i>Hamed Abdelreheem Ead</i>	119
<b><u>A Hypothesis on the Original Meaning of Samson's Hair</u></b> <i>Felice Vinci</i>	139

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The current issue is the second of the tenth volume of the *Athens Journal of Mediterranean Studies (AJMS)*, published by the [Athens Institute for Education and Research](#).

Gregory T. Papanikos  
President  
ATINER



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14-18 April 2025, Athens, Greece

The [Center for European & Mediterranean Affairs](https://www.atiner.gr/2025/FORM-MDT.doc) organizes the 18<sup>th</sup> Annual International Conference on Mediterranean Studies, 14-18 April 2025, Athens, Greece sponsored by the [Athens Journal of Mediterranean Studies](https://www.atiner.gr/2025/FORM-MDT.doc). The aim of the conference is to bring together academics and researchers from all areas of Mediterranean Studies, such as history, arts, archaeology, philosophy, culture, sociology, politics, international relations, economics, business, sports, environment and ecology, etc. You may participate as stream leader, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (<https://www.atiner.gr/2025/FORM-MDT.doc>).

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- Submission of Paper: **20 May 2024**

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- **Dr. Yannis Stivachtis**, Director, [Center for European & Mediterranean Affairs](#) and Associate Professor, Jean Monnet Chair & Director of International Studies Program, Virginia Tech – Virginia Polytechnic Institute & State University, USA.

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## **Regional Effects of the Great Recession on Greek Unemployment Rates: A Graphical Analysis**

*By Gregory T. Papanikos* \*

*It is well documented that the Great Recession hit Greece very hard. External and internal factors have been put forward to explain why Greece was hit so hard relative to the other countries of the eurozone. Less attention has been paid to regional differences of the Great Recession impact. This study examines the effect of the Great Recession on the 13 NUTS2 regions of Greece, with an emphasis on the unemployment rate. Two issues are examined. First, the differences in the unemployment rates between the thirteen Greek regions are presented using available evidence from 1998 to 2022. Large differences in unemployment rates are observed. The second issue is the impact of the Great Recession on the convergence (or divergence) rates of the unemployment rates across regions.*

**Keywords:** *Great Recession, unemployment rate, Greek regions, eurozone*

### **Introduction**

Unemployment rates are among the most important macroeconomic indicators, along with the rate of economic growth and the inflation rate. Despite its serious measurement and reporting errors, the unemployment rate is used to guide economic policy. It is also one of the variables that has significant political repercussions. Mass unemployment undermines democracy<sup>1</sup> itself and can lead to the emergence of extreme political parties in power. The rise of the Nazis in Germany was primarily the result of mass unemployment during the depression of the 1920s and 1930s.

The Great Recession of the 2010s was the worst economic crisis since the Great Depression, also leading to political instability<sup>2</sup>. One of the hardest-hit economies in the Western world was the Greek economy. During the Great Recession, the impact on the Greek economy was historically unprecedented, as

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\*President, Athens Institute for Education and Research, Greece. The author has taught for many years in Canadian, Greek and U.K. Universities.

<sup>1</sup>On the democracy issue, see my papers Papanikos (2022a, 2022b, 2022c, 2022d, 2022e) and the comments by Meydani (2022) and Petratos (2022)

<sup>2</sup>In Greece, for example, we witnessed the rise of populist parties from both the right and the left. The first elections after the Great Recession occurred in 2012 and 2015. The 2012 elections resulted in a historical coalition government between the socialists and the center-right party, which had governed Greece separately since 1974. In the 2015 elections, a new coalition emerged, even more surprising, as it involved a populist party of the left and a populist party of the right. This occurred despite the election results favoring a coalition of center-left parties. I have extensively addressed this issue; please refer to Papanikos (2012a, 2012b, 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2015g, 2015h).

documented by many studies<sup>3</sup>. However, less attention has been devoted to the regional impacts, despite the European Commission (2023) correctly pointing out that within countries, regional disparities are greater than between countries. This paper examines these regional disparities using NUTS2 Greek regional data. Additionally, it provides an introduction and assessment by comparing national unemployment rates of the euro countries.

The issue of unemployment has been studied by many authors. Avola (2015) examines the regional effects of labor market outcomes emphasizing the integration of natives with migrant workers<sup>4</sup>. The issue of good and bad jobs is at stake here, which is very similar to the problems that Greek regions are facing in the post-crisis and post-pandemic period. Agriculture and tourism require unskilled labor – jobs that are deemed undesirable by natives – to such an extent that the Greek government is seeking temporary workers from countries like India, Egypt, Armenia, Moldova, Georgia, the Philippines, and Vietnam. The quality of jobs is at the heart of regional differences in unemployment rates because most desirable jobs are available in the two main regions (cities) of Greece: Attiki (Athens) and Kentriki Makedonia (Thessaloniki).

Greece is a member of the European Union (EU) and the Eurozone. These institutions have policies that affect regional outcomes, including the unemployment rate. One of the advantages of economic integration is the freedom of movement of all factors of production, including labor. This has affected the demand for and supply of labor at the European level. For a radical approach to this issue, see Bifulco (2017) and Kall (2017). Bruneau and Girard (2021) use French data to investigate the association between human capital and labor productivity. The role of aggregate demand, technology, microeconomics in determining labor demand and supply has been examined by Amaghionyeodiwe and Annansingh-Jamieson (2017), Dyczkowska and Dyczkowski (2018), Eğribayun (2023), Genty et al. (2021), Hoti (2017), Koironen and Rautamäki (2024), Laaksonen et al. (2023), Menguy (2019), Moussa et al. (2022), Ndamsa et al. (2020), Nguyen and LeBlanc (2018, 2021), and Reid (2023).

In this study, we do not examine the issue of regional differences in labor productivity, but it can potentially explain regional differences in the unemployment rate<sup>5</sup>; we will revisit this issue in the concluding remarks of this study.

The paper is organized into five sections, including this introduction. The next section provides a simple theoretical framework of the convergence issue. Section

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<sup>3</sup>See Papanikos (2015i & 2024) and the references cited therein. Markovits et al. (2017) examine how the Great Recession affected Greek workers' attitudes. As expected, unemployed workers had more negative attitudes and higher burnout. Sommeiller (2020) examines the effect of the Great Recession on poverty in Southern European countries.

<sup>4</sup>The issue of labor migration has become prominent, with numerous studies exploring it; for example, see Tsai and Yen (2017). Migration is closely related to another significant aspect of the labor market, which is aging. Fuchs (2015) addresses this issue by examining the aging of the German population in the labor market. Furthermore, this issue connects to the expectations of youth in advanced countries, as examined by Nelson and Braekkan (2017).

<sup>5</sup>European Commission (2023, p. 4) noted that “Positive trends in labour productivity reflect upward convergence, though disparities are still high between Member States and even more between EU regions.

three compares the unemployment rates of the Eurozone countries, and the subsequent section examines the Greek regional unemployment rates, including the important issue of convergence. The final section includes a discussion and the conclusions of this study.

### A Simple Theoretical Framework

In the long run, spatial differences in unemployment rates will tend towards zero in well-integrated labor markets where there are no transaction costs of mobility. In the short run, spatial divergences in unemployment rates are possible due to the adjustments required to move between jobs. In the context of Greek regions, such costs could be prohibitive when a person, accustomed to receiving family support, potentially owns a house and a small farm that can generate additional income. The wage differential should be high enough to cover these costs, yet such differentials do not exist within Greece. This explains why it is easier to move abroad to another country than to a different region within Greece. The wage differential between Greece and other countries is much higher than the wage differential between Greek regions.

In the long run, it is assumed that the differentials in unemployment rates tend towards zero or a constant because some differentials exist due to the transaction costs mentioned above. This implies that in the long run:

$$\lim_{s \rightarrow \infty} E(|ur_{i,t+s} - \tilde{ur}_{t+s}|) = \alpha \quad \forall \alpha \geq 0$$

where:

$ur_{i,t+s}$ : the unemployment rate in region or country (i) in period (t+s)

$\tilde{ur}_{t+s}$ : the average unemployment rate of all regions or countries in the sample in period (t+s)

The difference between the unemployment rate of a region or a country and the corresponding average unemployment rate should follow a stationary process. This process defines stochastic convergence. If convergence takes place, then these differences in unemployment rates should decrease. Ultimately, these differences should converge to zero or reach a constant ( $\alpha$ ). The standard deviations should decline if the unemployment rates converge over time and increase if the unemployment rates diverge.

This simple approach to convergence/divergence of unemployment rates is examined using simple descriptive (graphical) statistical analysis. The next section examines the differences in unemployment rates within the euro countries, and the following section investigates the convergence and divergence of unemployment rates among the thirteen Greek regions. In the first case, we use the average unemployment rate of the twenty eurozone countries as a reference, and in the latter case, we utilize the national unemployment rate of Greece.

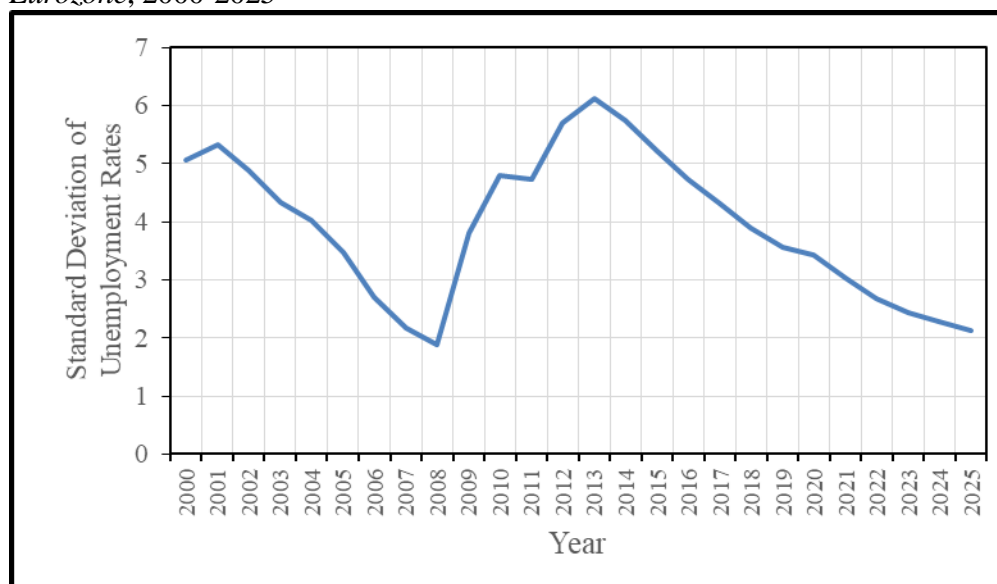
### The Great Recession and the Unemployment Rate in the Eurozone

One of the arguments put forward to support European integration is upward convergence or regional cohesion. Greater integration not only enhances the wealth of all member countries but also reduces inequalities between them.

This section first examines the issue of convergence of unemployment rates in the eurozone countries and thereafter evaluates the unemployment rates of five eurozone countries that were hardest hit by the recession. We maintain a straightforward discussion and utilize the standard deviation of the unemployment rates as a measure of convergence<sup>6</sup>.

Figure 1 shows the standard deviation of the unemployment rates of the twenty eurozone countries from 2000 to 2025. Data after 2023 are estimates from the European Commission. Although the initial eurozone consisted of twelve countries, all twenty are included. This is justified by the fact that convergence deepens once a decision to join is made, as adjustments take place, some initiated by government policies but the most significant ones by private sector expectations. If a country is in the process of becoming a member of the eurozone, its policies and the expectations of economic agents are such that the benefits and costs are realized before the actual adoption of the euro takes place. This phenomenon also occurred among the initial twelve eurozone countries. Hence, the starting year of 2000 is used, even though the euro was adopted in 2002.

**Figure 1.** *Convergence of Unemployment Rates in the Twenty Countries of the Eurozone, 2000-2025*



Source: Eurostat (after 2023, data are European Commission's estimates).

The graph reveals three important features of the convergence of unemployment rates in the euro countries since 2000. First, the adoption of the

<sup>6</sup>In my paper, Papanikos et al. (2004b), I examined convergence among the Greek regions in the 1980s using various measures of convergence.



euro drastically increased convergence from five standard deviation percentage points in 2000 to 1.9 in 2008. Second, the Great Recession, which hit the eurozone countries in 2008, increased the divergence of unemployment rates. The minimum value of the entire period in 2008 was 1.89, which jumped to 6.1 in 2013. As shown in Table 1, these two values represent the two extremes of the entire period, with a range of 4.2 percentage points. Third, after the Great Recession (post-2013), convergence picked up at a relatively high rate, with the exception of 2020 (the pandemic year) when the rate of increase in convergence slowed down. In 2019, it was 3.6 standard deviation percentage points, and in 2020, it was 3.4.

**Table 1.** *Summary Statistics of the Convergence Index (2000-2025)*

Statistic	Value
Mean	3.9412
Standard Error	0.2459
Median	3.9609
Range	4.2165
Minimum	1.8926
Maximum	6.1091

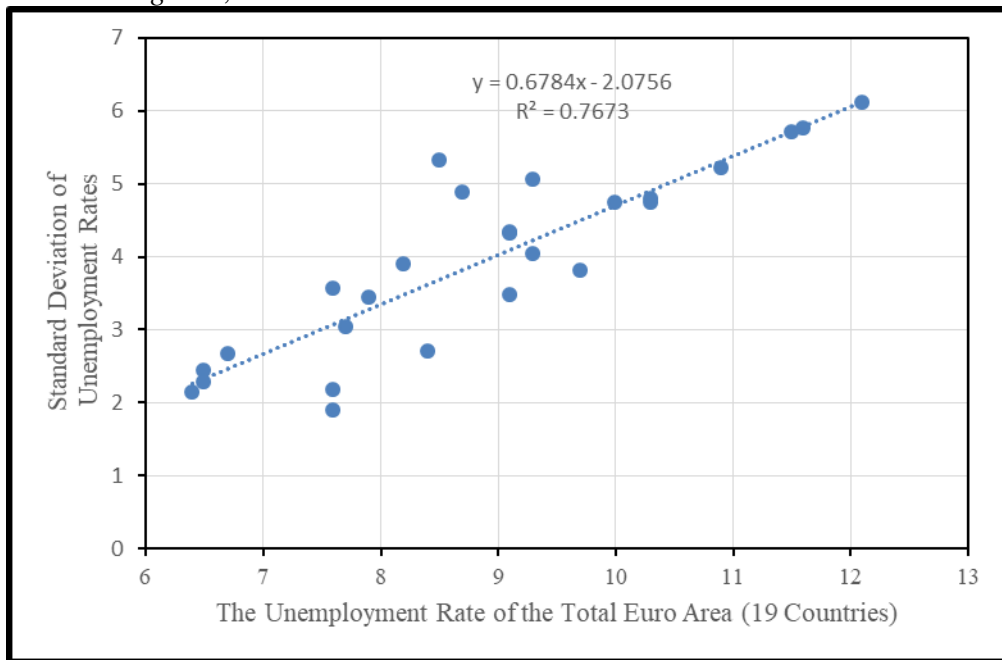
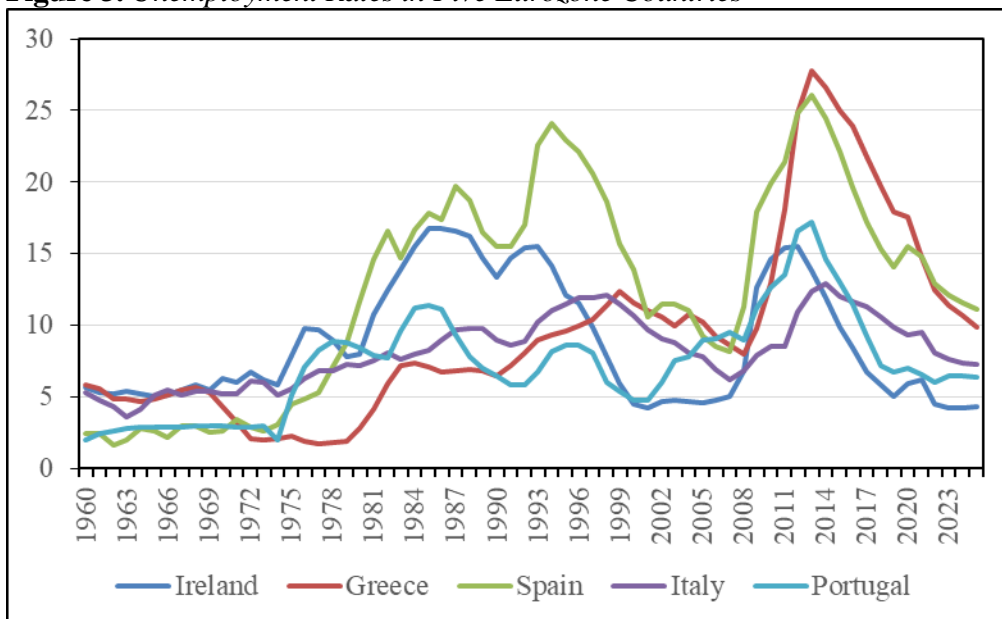
It appears that there is a positive association between convergence and the level of the unemployment rate. This implies that the Great Recession did not affect all Eurozone countries to the same extent. Some countries were hit much harder than others, leading to an increase in the divergence of unemployment rates.

Figure 2 demonstrates this positive relationship between the unemployment rate and the divergence of unemployment rates among the Euro countries. The simple fitted line explains the association between unemployment rates in the Euro area and the convergence rate very well. The coefficient of determination is 0.7673, and the implied correlation coefficient is 0.8760.

The Great Recession hit the hardest in five Eurozone countries: Greece, Ireland, Italy, Spain and Portugal. Figure 3 compares the unemployment rates of these five countries using a long time series of data<sup>7</sup>. The uniqueness of this group of countries lies in their loss of national independence in monetary policy, and consequently, the determination of the effective exchange rate. As argued in Papanikos (2015a), the Greek real effective exchange rate was the highest among the Eurozone countries during a period when an effective devaluation could have mitigated the impact of the Great Recession on the Greek economy<sup>8</sup>. This section compares the unemployment rates of Eurozone countries. Figure 3 displays the unemployment rates of five Eurozone countries: Greece, Ireland, Italy, Portugal, and Spain.

<sup>7</sup>A similar comparison at the national level has been addressed in many studies; for example, see Correia and Carvalho (2016).

<sup>8</sup>The Greek economy has other characteristics, such as its unique geography with numerous inhabited islands, which impose additional costs for infrastructure and regulation. I have examined these unique characteristics elsewhere; please refer to Papanikos (2004a, 2004b, 2015a, 2015b).

**Figure 2.** *The Scatter Diagram of the Unemployment Rate in the Eurozone Area and Convergence, 2000-2025***Figure 3.** *Unemployment Rates in Five Eurozone Countries*

Source: Eurostat.

A number of interesting observations can be made by examining Figure 3. Up to 1975, Portugal and Spain had very similar unemployment rates, both lower than 3.5%, while Ireland and Italy had slightly higher rates, though not exceeding 6%. Greece, until 1972, had rates similar to Ireland and Italy. However, after 1972, the Greek unemployment rate became the lowest among the group of five countries, a trend that persisted up to 1990.

The 1992 recession significantly impacted Spain and Ireland. Although Ireland managed to recover, Spain's unemployment rate remained persistently high throughout the entire period under consideration<sup>9</sup>.

Examining national unemployment rates masks differences that might exist at the regional level. In some cases, national policies to combat unemployment may prove ineffective due to structural differences at the regional level. The next section examines the differences in unemployment rates among the 13 Greek regions.

### **Regional Disparities of the Unemployment Rates in Greece**

Greece is divided into 13 NUTS2 regions called peripheries. Table 3 provides labor market raw data statistics of the 13 regions, and Table 4 offers summary statistics for 2022.

The first thing these data illustrate is the great diversity among the 13 regions. This is clearly seen when examining the dispersion of data in Table 4: minimum, maximum, and the range of data. Half of Greek employment occurs in the two largest cities of Greece: Athens (region of Attiki) and Thessaloniki (region of Kentriki Makedonia). Historically—though not shown in the tables—this is the result of a long process of internal migration, which resulted in a significant movement of urbanization primarily after the Second World War. Many reasons can explain this rush into the cities, but they go beyond the scope of this paper.

The focus of this paper is on the unemployment rate, particularly the differences in unemployment rates. The Greek national unemployment rate was 12.44% in 2022. We use this rate to calculate regional unemployment rate differences. Regions with rates above (positive difference) or below (negative difference) this rate appear in the last column of Table 4. Four regions were performing better than the regional average: Attiki, Kriti, Notio, and Voreio Aigaio. It is not a coincidence that these regions had a relatively record number of tourist inflows in 2022. All the other regions had unemployment rates above the national average. Attiki (Athens) had the lowest unemployment rate at 9.98%, which is 2.46% lower than the national average. Dytiki Makedonia had the largest unemployment rate deviation from the national average, at 5.23%. Many regions had unemployment rates very close to the national unemployment rate, i.e., less than 1%. These regions were Dytiki Ellada, Ionia Nisia, Kriti, Peloponissos, and Voreio Aigaio.

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<sup>9</sup>The unemployment rates of Spain and Greece are examined by Fernández et al. (2024).

**Table 3.** Labor Market Statistics by Region (2022)

	Periphery (Region)	E	U	LF	UR	URDIF
1	Anatoliki Makedonia, Thraki	213.6	36.9	250.5	14.73%	2.29%
2	Attiki	1575.4	174.6	1750	9.98%	-2.46%
3	Dytiki Elláda	241.1	34.8	275.9	12.61%	0.17%
4	Dytiki Makedonia	89	19.1	108.1	17.67%	5.23%
5	Ionia Nisia	74.7	11.1	85.8	12.94%	0.50%
6	Ipeiros	117.8	18.1	135.9	13.32%	0.88%
7	Kentriki Makedonia	682.7	117.3	800	14.66%	2.22%
8	Kriti	250.5	34.4	284.9	12.07%	-0.36%
9	Notio Aigaio	126.1	15.1	141.2	10.69%	-1.74%
10	Peloponnisos	216.4	31.1	247.5	12.57%	0.13%
11	Stereia Elláda	209.1	33.5	242.6	13.81%	1.37%
12	Thessalia	269.6	52.4	322	16.27%	3.83%
13	Voreio Aigaio	74.6	9.7	84.3	11.51%	-0.93%
	<b>Total Greece</b>	<b>4140.6</b>	<b>588.2</b>	<b>4728.8</b>	<b>12.44%</b>	<b>0.00%</b>

Source: <https://www.statistics.gr/el/statistics/-/publication/SJO03/->.

**Table 4.** Labor Market Summary Statistics by Region (2022)

	E	U	LF	UR	URDIF
Mean	319	45	364	0.1329	0.0086
Median	214	34	248	0.1294	0.0050
Standard Deviation	409	48	456	0.0216	0.0216
Kurtosis	9	4	8	0.1082	0.1082
Skewness	3	2	3	0.5246	0.5246
Range	1501	165	1666	0.0769	0.0769
Minimum	75	10	84	0.0998	-0.0246
Maximum	1575	175	1750	0.1767	0.0523

The main question of this paper is how the three important events of the 21st century affected regional convergence in Greece. These events are as follows, in chronological order:

- How has the European Monetary Union and the adoption of the common currency affected the convergence of the thirteen regions?
- How has the Great Recession impacted the convergence process of the Greek regions?
- Did the pandemic have any effect on the regional convergence of Greece?

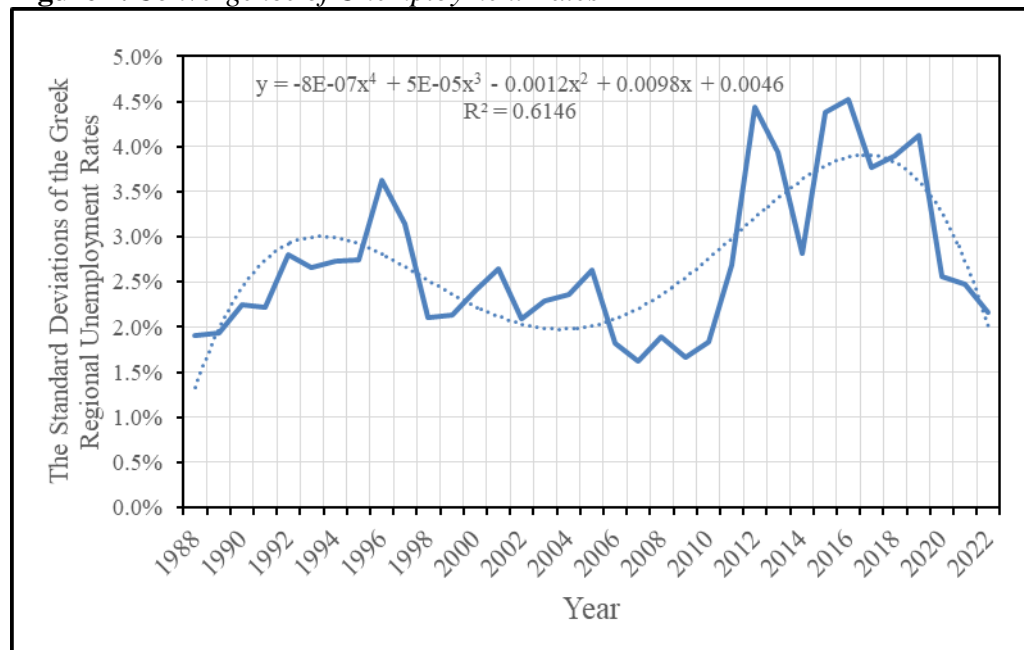
Figure 4 shows the standard deviations of Greek regions' unemployment rates from 1988 to 2022. Prior to the EMU, the standard deviation was increasing, indicating divergence. In 1996, a new government with a very strong and fresh mandate vowed to do whatever possible for Greece to become a member of the eurozone with the first wave of countries that decided to join. This had an immediate impact on the regional convergence indicator. Convergence increased (the standard deviation of the unemployment rate differences from the Greek national rate decreased) from 3.62% in 1996 to 3.15% in 1997 and 2.11% in 1998. In the early years of the euro in circulation, the convergence rate (from 2002 to

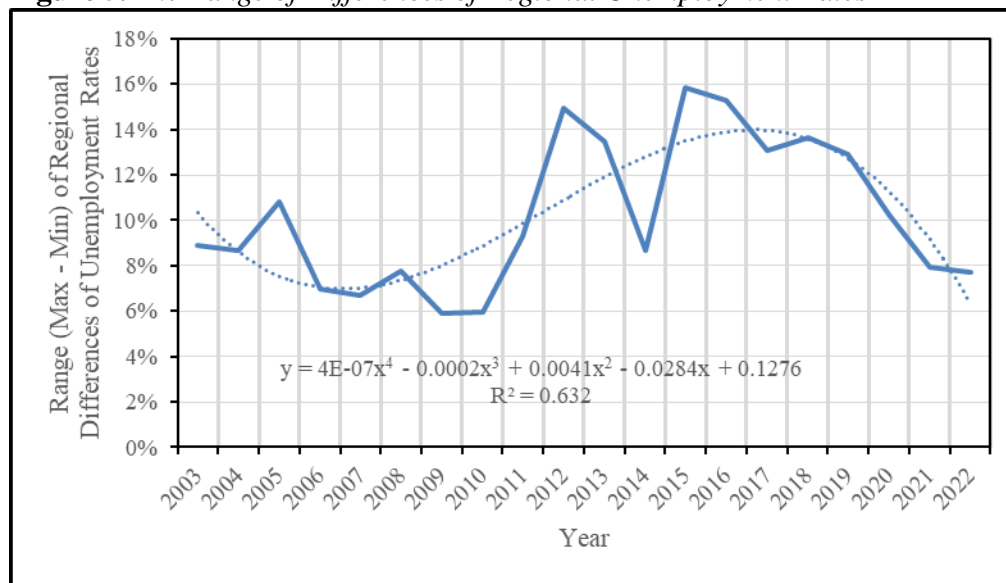
2005) decreased. One explanation might be the huge investments made in Athens to host the 2004 Olympic Games. After 2005, the convergence rate increased (the standard deviation fell) until 2010. The Great Recession had a significant impact on Greek convergence both in its level and its variability. It reached record values in 2012 of 4.43% and 4.56% in 2016.

The pandemic did not have any considerable impact on the convergence index. It seems that COVID-19 affected all the Greek regions equally, leaving the convergence rate unchanged. The convergence rate increases but still has not reached the record number of 2007 of 1.62%.

Figure 5 presents the range of Greek regional unemployment rates, which is a crude measure of dispersion based only on the two extreme values of maximum and minimum, while the standard deviation of the unemployment rate differences takes into consideration all values of the distribution. The range, in this context, is more important than the standard deviation because of political reasons. It shows how hard one particular region has been affected, which has serious repercussions for policy making. However, the analysis of the three basic assertions of this paper does not differ from the one presented above when Figure 3 was analyzed.

**Figure 4.** *Convergence of Unemployment Rates*



**Figure 5.** *The Range of Differences of Regional Unemployment Rates*

Recapitulating the above findings, descriptive measures of divergence show that Greek regional convergence was positively affected by the adoption of the euro, negatively impacted by the Great Recession, and was not affected by the pandemic.

## Discussion and Conclusions

One conclusion that might emerge from the above analysis is that when the economy is performing well, convergence in the eurozone is also positive. Conversely, when the economy is struggling, it appears that each country and region is left to address economic challenges independently.

Even more concerning, during economic downturns such as the Great Recession, countries and regions within a single country often engage in a blame game, leading to potentially serious political repercussions. Fortunately, albeit at the eleventh hour, eurozone leaders, or some of them, recognized that the situation was more complex than initially perceived and adjusted their policies towards the hardest-hit countries, as was the case with Greece. It seems they have been vindicated when examining Greece's basic macroeconomic indicators today, including the unemployment rate. Greece was able to return to what can be considered its long-run unemployment rate within a few years without compromising political and social stability. One can only speculate what would have happened to Greece had it chosen to abandon the eurozone.

The main conclusions drawn from this paper's graphical analysis of unemployment data suggest that regional disparities in unemployment rates within a single country are as pronounced as the differences between countries in the eurozone. In the Greek context, which was the focal point of this paper, regional convergence of unemployment rates was positively influenced by Greece's participation in the eurozone and negatively impacted by the Great Recession. The



evidence indicates that the pandemic did not affect the convergence rate of the thirteen Greek regions.

As indicated by the title of the paper, this is a graphical (descriptive) analysis of unemployment rate differences. It illustrates how convergence evolved during the 21<sup>st</sup> century and its correlation with three pivotal developments: the establishment of the Eurozone, the Great Recession, and COVID-19. No attempt was made to uncover the causes of differences among countries and regions. Undoubtedly, demand effects are significant contributors, but other factors such as labor productivity may also play a role in explaining long-term differences in unemployment rates. Demand effects typically have transient impacts, whereas productivity differences may have enduring effects. Determining the extent to which variations in unemployment rates between countries and regions are due to transient or enduring effects necessitates a different methodology, which remains a topic for future research.

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## GREECE vs. SPAIN: Similarities and Differences in the Evolution of Unemployment in the 21<sup>st</sup> Century

By M<sup>a</sup> Jesús Arroyo Fernández<sup>\*</sup>, María-Carmen García-Centeno<sup>±</sup>,  
Inmaculada Hurtado Ocaña<sup>°</sup> & Pedro Fernández Sánchez<sup>•</sup>

*Unemployment is one of the main problems facing today's economies. In the context of the European Union, it is the Mediterranean economies that have traditionally shown a less favorable evolution of unemployment. This paper presents an explanatory model of the evolution of unemployment in two of these Mediterranean economies, Greece, and Spain, since the launching of the European Monetary Union. These were two of the European economies hardest hit by the Great Recession of 2008 and subsequently by the pandemic in 2020, so it is interesting to study which economic factors would explain the evolution of their unemployment rates. For this purpose, economic variables such as GDP pc, the output gap, investment, deficit, the employment rate by educational levels, inflation, labour productivity, labour force and public spending as a percentage of GDP. On the other hand, it is interesting to note to what extent Greece and Spain have or have not shown similar patterns of behavior of their labour markets so far this century, and what kind of economic policy measures could be put in place to ensure that both countries cease to have one of the highest unemployment rates in the EU. Finally, it will be analyzed how they have been affected by the Great Recession and the covid health crisis.*

**Keywords:** unemployment rate, macroeconomic variables, labour market policies, Great Recession, COVID-19

### Introduction

Throughout the 21<sup>st</sup> century, the larger Mediterranean countries have undergone a drastic change in the behavior of their labour markets. Whereas until 2008 the countries of the East had higher unemployment rates, after the Great Recession it has been the countries of the South, and especially Greece and Spain, that have maintained a greater unemployment differential with the rest of their EU partners (Figure 1). Not only do they have higher unemployment rates, but also the effectiveness of their employment policies is proving to be lower. Greece reached the highest level of unemployment in 2013 (27.8%), with Spain slightly below

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<sup>\*</sup>Associate Professor, Department of Economics, Universidad San Pablo-CEU, CEU Universities, Spain.

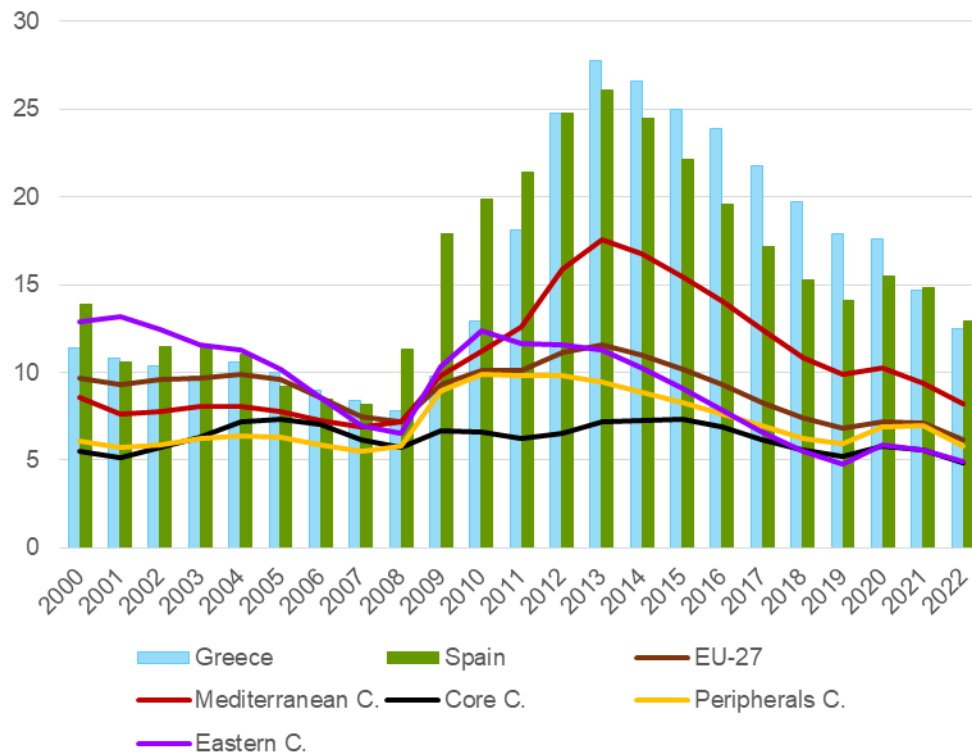
<sup>±</sup>Associate Professor, Department of Mathematics and Data Science, Universidad San Pablo-CEU, CEU Universities, Spain.

<sup>°</sup>Associate Professor, Department of Economics, Universidad San Pablo-CEU, CEU Universities, Spain.

<sup>•</sup>Associate Professor, Department of Economics, Universidad San Pablo-CEU, CEU Universities, Spain.

(26.1%). The EU-27 average in that year was much lower (11%). In 2022, although the differential has narrowed, the two Mediterranean countries are still above the European average.

**Figure 1.** *Evolution of the Unemployment rate in the Member States by Groups of Countries (%)*



Source: Eurostat (2023).

The unemployment rate of a country is usually a good indicator of its social and economic strength, since it shows its productive capacity and the quality or welfare of its people. For this reason, this paper analyzes the different economic and non-economic variables that can influence the evolution of unemployment in Greece and Spain. Specifically, the explanatory variables considered are GDP per capita (GDPpc), output gap (Out), investment (Inv), active population (PAT), real productivity per hour worked (RP), public deficit (DF), employment rate by educational level (up to secondary education, Em2, or with higher education, Em3), inflation based on the harmonized index of consumer prices (HICP), and public expenditure as a percentage of GDP (ExpGDP). Two dummy variables of the Great Recession and the effect of the COVID-19 pandemic have also been included, as both could have significantly affected the evolution of unemployment.

To carry out the analysis, the paper is structured in the following five sections. After this brief introduction, the second section justifies the choice of Greece and Spain as the countries under study and analyzes the evolution of both economies in terms of unemployment. The third section presents a descriptive analysis of each of the variables and the methodology used in the study, followed by an analysis of the

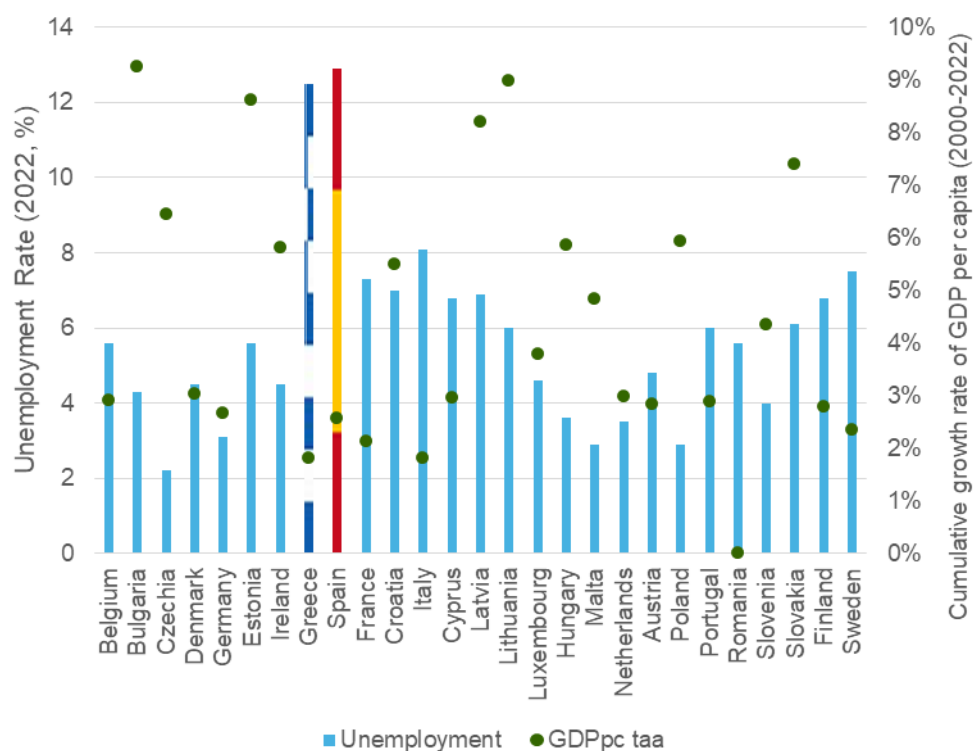


results of the econometric model in section four. Finally in the last section, the conclusions include economic policy recommendations based on the results obtained.

### Greece and Spain: The Problem of Unemployment

The problem of unemployment is a matter of concern for all governments, especially those whose unemployment rates are difficult to control through national economic policies. In many cases this is a direct consequence of excessively rigid labour markets.

**Figure 2.** *Unemployment Rates and Cumulative GDP per Capita Growth in the EU*



Source: Eurostat 2023.

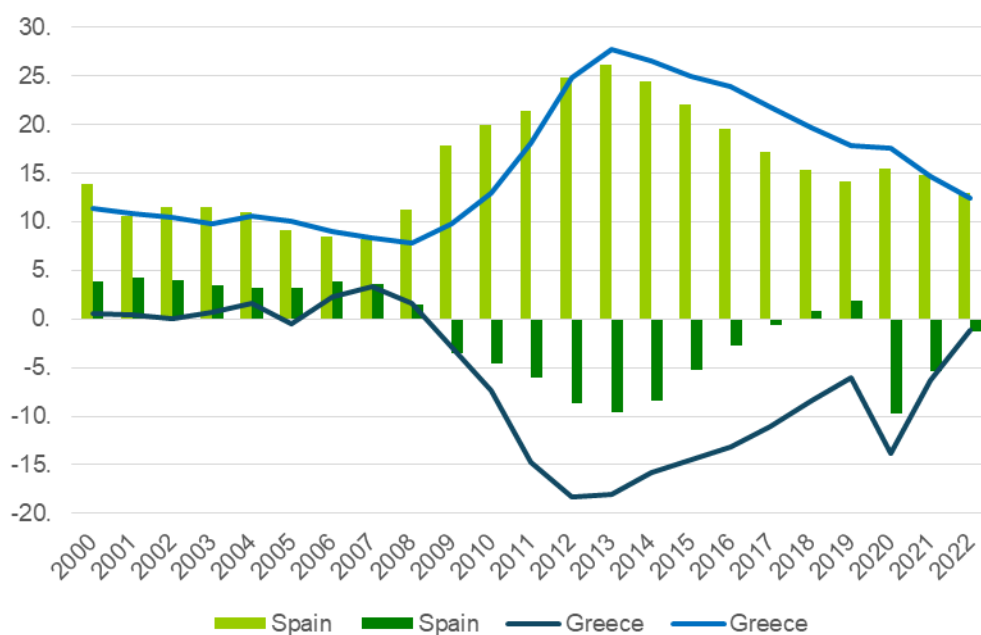
In the context of the European Union, Greece and Spain have traditionally maintained high unemployment rates. As can be seen in Figure 2, these economies, despite showing cumulative GDP per capita growth rates between 2000 and 2022, like those of Germany, France, Belgium, Austria, the Netherlands, or Italy, nevertheless maintain high levels of unemployment. This indicates that individual income growth is not leading to lower unemployment rates, and growth in both countries may need to be higher to absorb the population that wants to work but cannot<sup>10</sup>. In fact, countries such as the Czech Republic, Malta, Poland, and

<sup>10</sup>Such dynamics potentially reflect variations in Okun's Law across different national contexts.

Hungary have been able to maintain rates below 4%, with growth above 6% (Figure 2).

The importance of the study of GDP pc growth in countries and its influence on unemployment is determined by their capacity to reverse the level of unemployment reached in periods of economic expansion during periods of crisis. As can be seen in Figure 3, both for Spain, but above all for Greece, a clear countercyclical character can be observed. In fact, since the exit of the Great Recession, in 2013, the decrease in unemployment rates has been 13.2 percentage points in Spain and 15.3 in the case of Greece; when the cumulative growth since that year had been 2.7% and 2.0%, respectively.

**Figure 3.** *Output Gap and Unemployment Rate in Greece and Spain*



Source: Ameco and Eurostat 2024.

It is therefore necessary to analyze the behavior of the main variables that are affecting the evolution of unemployment in both economies. Only in this way will the economic authorities be able to act effectively to prevent them from continuing to be the countries with the highest unemployment rates in the EU.

For this purpose, the economic variables that, according to the economic literature, may be related to the evolution of unemployment have been considered.

Firstly, the evolution of GDP pc as discussed above, given the relationship between its evolution and unemployment. Secondly, the output gap (Out) has been considered since it shows the difference between the real output of the economy and its potential output. The larger the output gap, the lower unemployment will be, since the economy is producing above its potential, either because there are highly productive resources or because they are used efficiently.

Productive investment (Inv) has also been considered. Higher levels of investment will allow for greater productive capacity of companies. This will lead

to greater job creation, provided that the investment is not a substitute for the labour factor. Therefore, it is also necessary to include the labour force variable (PAT), because it gives us the determination of the labour force to join the labour market and its possibility of finding or not finding employment.

On the other hand, it is necessary to consider real labour productivity (RP), to check whether productivity improvements in Greece and Spain result in a lower unemployment rate.

Other variables that have also been included in the analysis are those related to public expenditure, either through the public deficit (DF) or through unemployment expenditure as a percentage of GDP (Exp/GDP). The purpose of this is to contrast whether higher deficit levels or spending on unemployment have made it possible to reduce it.

The extent to which increases in the minimum wage may affect unemployment levels continues to be a matter of controversy. An increase in the minimum wage could lead to an increase in unemployment, as companies would have to reduce their workforces to meet higher wages. On the other hand, it could have a positive effect by increasing the purchasing power of consumers who will demand more products.

Along these lines, wage levels could be linked to the educational levels of those hired. For this reason, we have included as reference variables employment at higher levels of education, specifically up to secondary (Em2) and tertiary (Em3). In this way, the aim is to estimate to what extent higher employment at these educational levels has an impact on lower unemployment rates.

Finally, inflation (HICP) has been incorporated into the model. The aim is to contrast whether the fight against price increases by the European Central Bank can lead to an increase in the unemployment rate.

Having considered the variables that could explain the evolution of unemployment in Spain and Greece, the following section will carry out a descriptive analysis of each of these variables. In addition, the main similarities, and differences in the evolution of these variables in both countries will be established, as well as the possible relationship between each of these variables and the evolution of the unemployment rate during this century.

## **Variables and Methodology**

### *Descriptive Analysis of the Independent Variables*

To have a descriptive view of the variables that will be used in the model and that may influence unemployment in Greece and Spain, Table 1 shows their main descriptive statistics. As can be seen, although the average unemployment rate in both economies is the same, the same is not true for their maximum and minimum values. Thus, the lowest and highest values of the unemployment rate have occurred in Greece. The Hellenic country reached the minimum in 2008 (7.8%) and the maximum in 2013 (27.8%). In Spain, the minimum unemployment rate, 8.2%, was reached in 2007 and the maximum in 2013, which amounted to 26.1%.

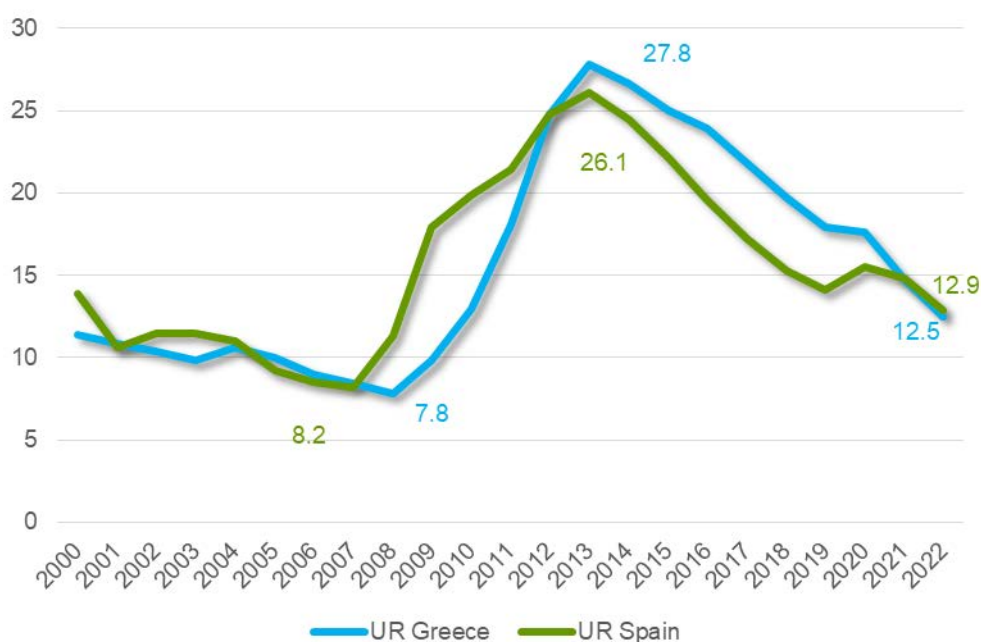
**Table 1.** Descriptive Analysis of the Variables (Sample Period 2000-2022)

Country	Variables	Minimum	Maximum	Mean	Std. Devn.	Pearson VC	Skewness	Excess Kurtosis
Greece	UR	7.8	27.8	15.7	6.4	0.4	0.5	-1.18
	GDPpc	13230	21840	17463	2234.3	0.1	0.3	-0.6
	Out	-18.3	3.1	-6.1	7.2	1.2	-0.3	-1.4
	Inv	11.9	27.4	18.8	5.9	0.3	0.1	-1.6
	PAT	1046	1112	1089	1650	1.5	-0.5	-0.7
	PR	87.8	122.5	105.2	9.9	0.1	0.2	-1.2
	DF	-15.2	0.9	-6.4	4.3	0.7	0.1	-0.6
	SMI	533.9	876.6	710.4	93.9	0.1	0.1	-0.7
	Em2	13.2	32.8	22.9	5.8	0.3	0.1	-1.2
	Em3	39.3	62.1	49.2	6.5	0.1	0.2	-1.3
	HICP	-1.4	9.3	2.1	2.4	1.1	0.2	-1.3
Spain	Exp/GDP	0.5	1.2	0.7	0.2	0.3	0.4	0.1
	UR	8.2	26.1	15.7	5.3	0.3	0.4	-0.9
	GDPpc	15970	27870	22545	2871.4	0.1	-0.5	-0.1
	Out	-9.9	4.0	-1.4	4.8	3.4	-0.4	-1.3
	Inv	17.2	30.6	23.2	4.3	0.2	0.3	-1.4
	PAT	4047	4743	4517	2284	0.5	-0.9	-0.6
	PR	89.5	101.3	94.9	4.4	0.0	0.2	-1.6
	DF	-11.6	2.1	-4.2	4.2	1.0	-0.2	-1.1
	SMI	495.6	1166.7	753.1	191.8	0.3	0.7	-0.3
	Em2	16.9	39.4	26.1	6.9	0.3	0.6	-0.8
	Em3	35.8	59	48.5	6.1	0.1	-0.2	-0.6
	HICP	-0.6	8.3	2.3	1.9	0.8	0.8	1.9
	Exp/GDP	1.4	3.8	2.2	0.8	0.4	0.6	-1.2

Source: Eurostat 2023.

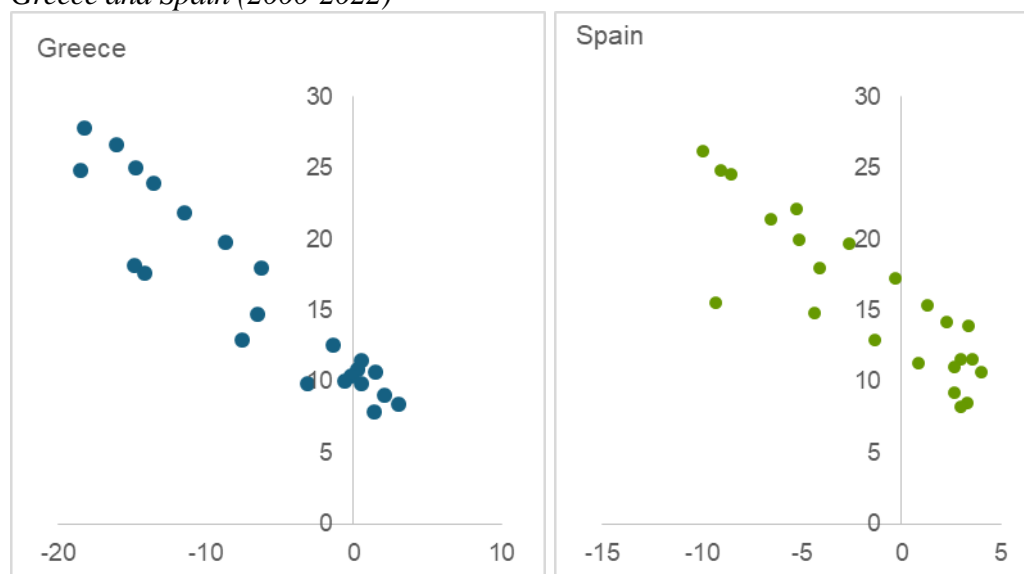
In all the variables analyzed, except for the output gap, labour force, deficit, and inflation, it can be stated that their means are quite representative, since the relative dispersion measured by Pearson's coefficient of variation is small and close to zero.

Observing the evolution of the unemployment rates of both countries, it can be stated that the behavior is quite similar for both economies (Figure 4). Since the beginning of the 21<sup>st</sup> century, unemployment has been on a downward trend in both countries. However, the abrupt change in trend affected Spain a year earlier than Greece (2008 vs. 2009). This increase in unemployment rates continued until 2013, after which it declined. In the years 2021 and 2022 both are very similar again, although they have not yet reached pre-crisis levels. Unemployment rates are positively asymmetric and platykurtic, which implies that there are more values concentrated at the extremes than around the average unemployment rate, with a greater number of values on the far right, i.e., there are more unemployment rates above than below their average.

**Figure 4.** *Unemployment Rate Evolution in Greece and Spain (2000-2022)*

Source: Eurostat 2023.

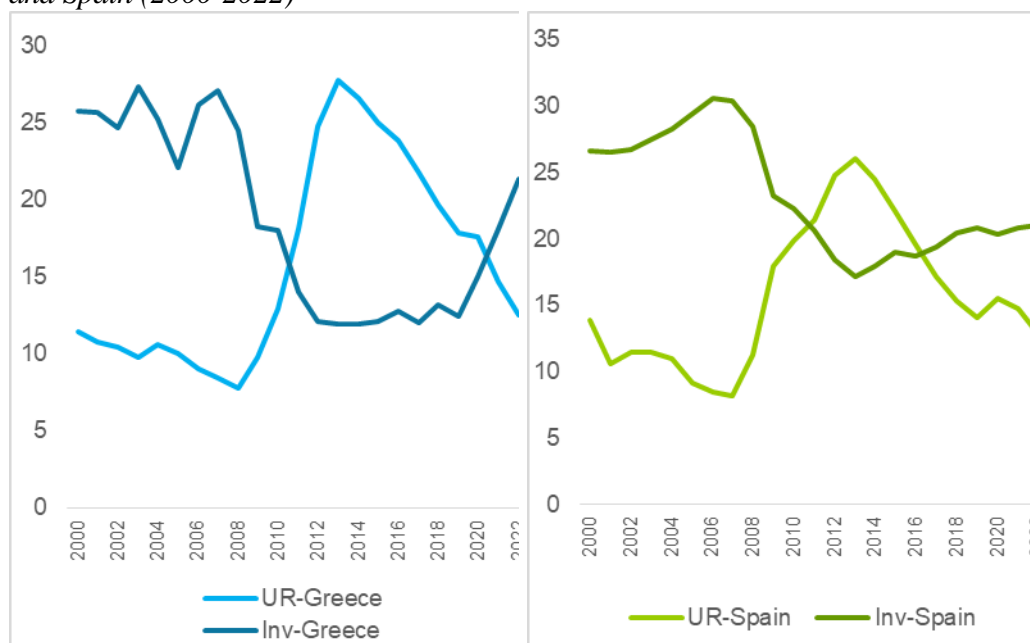
With respect to the output-gap and based on the descriptive data shown in Table 1, the lowest value is negative (in Greece -18.3 in 2012 and in Spain -9.9 in 2013). The maximums however are positive: the highest in Spain of 4.0 in 2001 versus the highest Greek of 3.1 in 2007. Figure 5 shows an inverse relationship between the output gap and the total unemployment rate for the two Mediterranean countries.

**Figure 5.** *Relationship between the Unemployment Rate and the Output Gap in Greece and Spain (2000-2022)*

Source: Eurostat 2023.

The behavior of investment (Inv), which is related to productive activity and the capacity to generate employment, is very similar to GDPpc, with higher minimum, maximum and average levels in Spain than in Greece. Also, in both cases investment is positively asymmetric, with a greater number of periods in which investment exceeds its mean (or is higher) and platykurtic (as the excess kurtosis is negative, it indicates that there are fewer values of investment that are concentrated around its mean). Figure 6 shows how, as in the case of the output gap, there is an inverse relationship between investment and the unemployment rate.

**Figure 6.** Relationship between the Unemployment Rate and Investment in Greece and Spain (2000-2022)

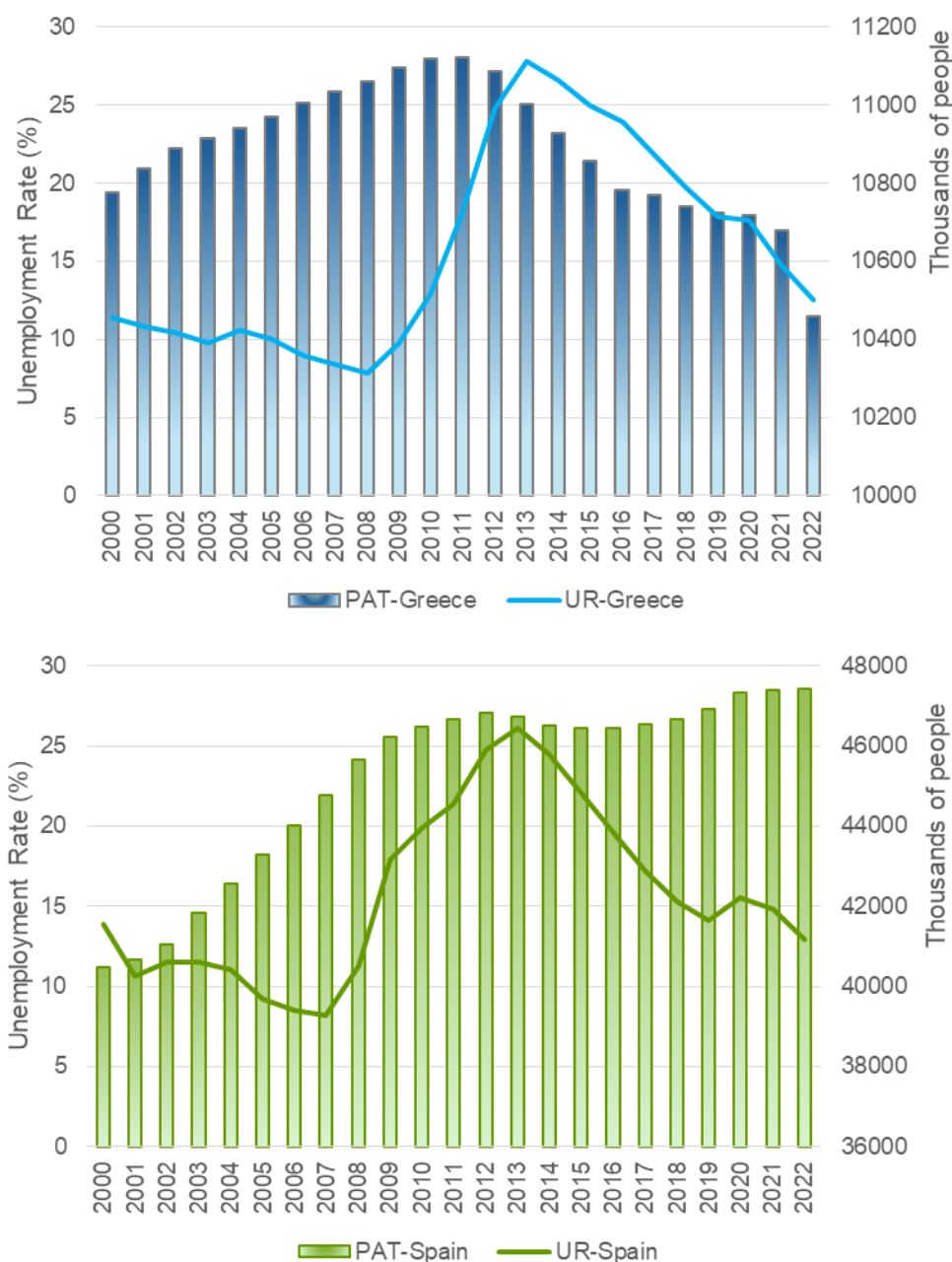


Source: Eurostat 2023.

Being a larger country, Spain has almost four times more active population (PAT) than Greece, which is why its maximum, minimum and average values are higher. Thus, for example, while the average labour force in Greece is slightly over one million people, in Spain it is over 4.5 million people. The labour force includes employed and unemployed persons between the ages of 15 and 64. Figure 7 shows that until 2011 there was a growth in the labour force in both economies (although this growth was higher in Greece than in Spain). On the other hand, the total unemployment rate in both countries decreased until the beginning of the Great Recession and then increased, this growth being higher than that of the labour force. Since 2013 the evolution of the PAT in both economies has been different: while in Spain it has slightly increased, in Greece it has shown a decreasing trend.



**Figure 7.** Relationship between Unemployment Rate and Total Labour Force in Greece and Spain (Sample Period 2000-2022)

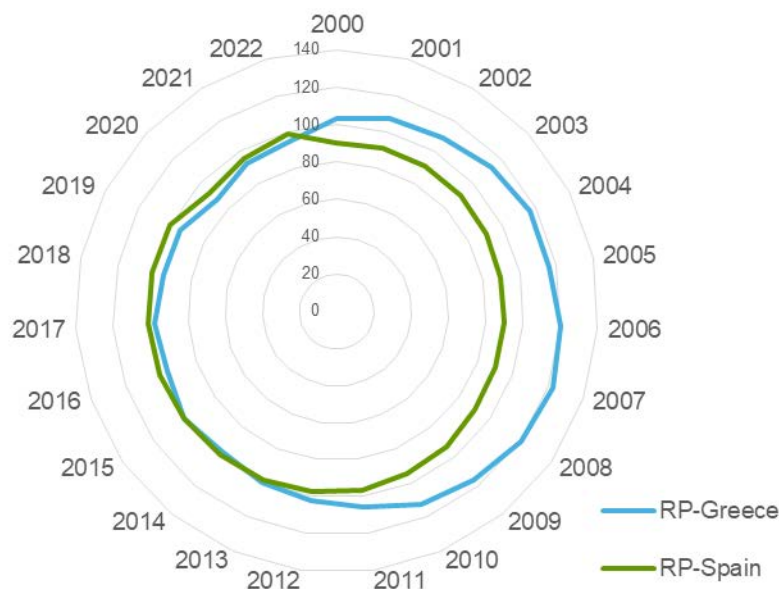


Source: Eurostat 2023.

Labour productivity shows the amount of goods and services produced per unit of labour. It reached its lowest value in Greece in 2020 (87.8) and its highest value of 122.5 in 2007. The average productivity in Greece was 105.2, compared to Spain (94.9). In both countries the asymmetry has been positive, implying that there have been more years in which productivity has exceeded the average than those in which it did not. Figure 8 shows how in the sample period prior to the

crisis, Greece's productivity was higher than Spain's, while, from 2013 onwards, the productivity of both countries tended to equalize. Since 2016, Spanish productivity has slightly surpassed Greek productivity.

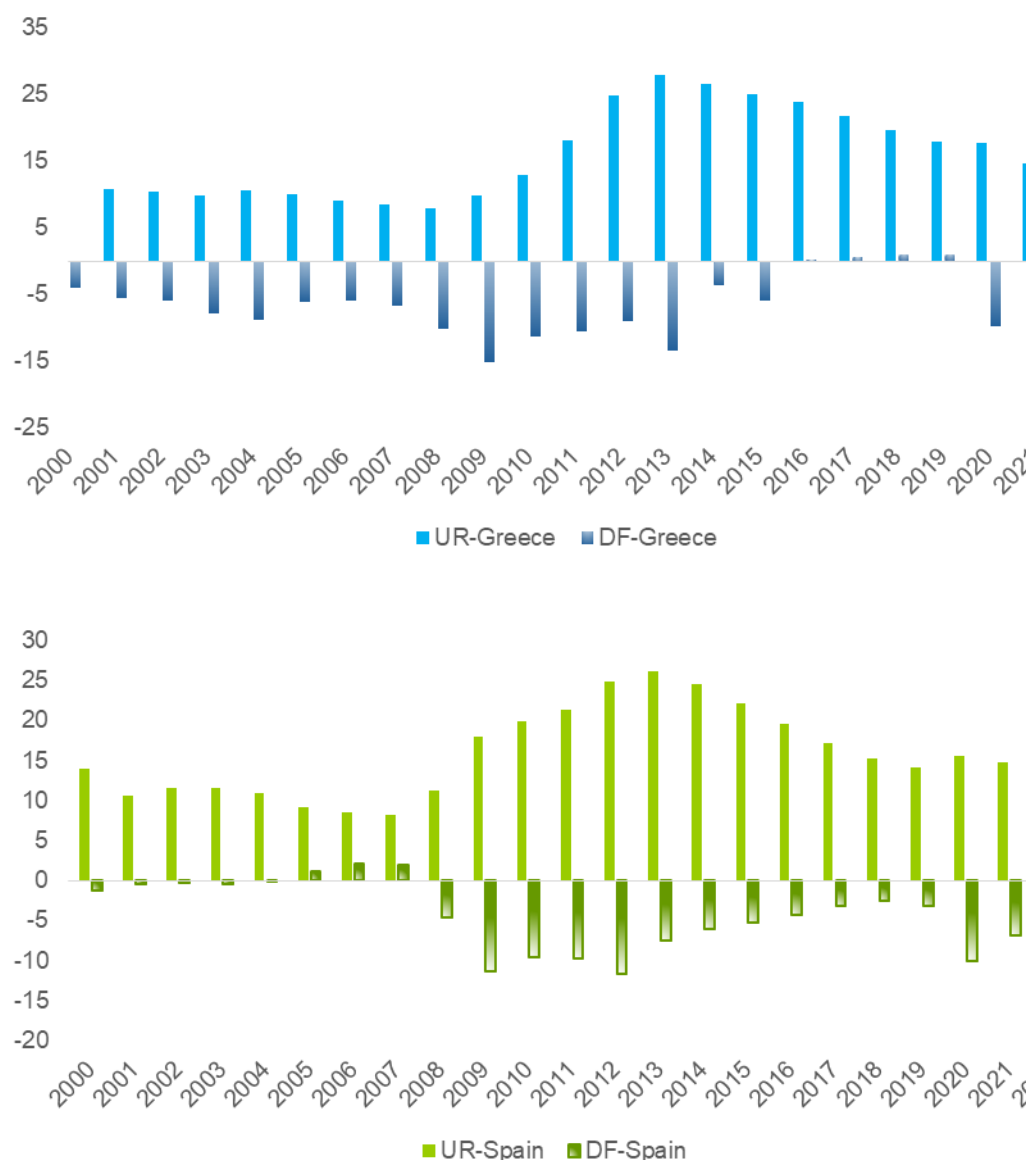
**Figure 8.** *Productivity in Greece and Spain. Sample Period (2000-2022)*



Source: Eurostat 2023.

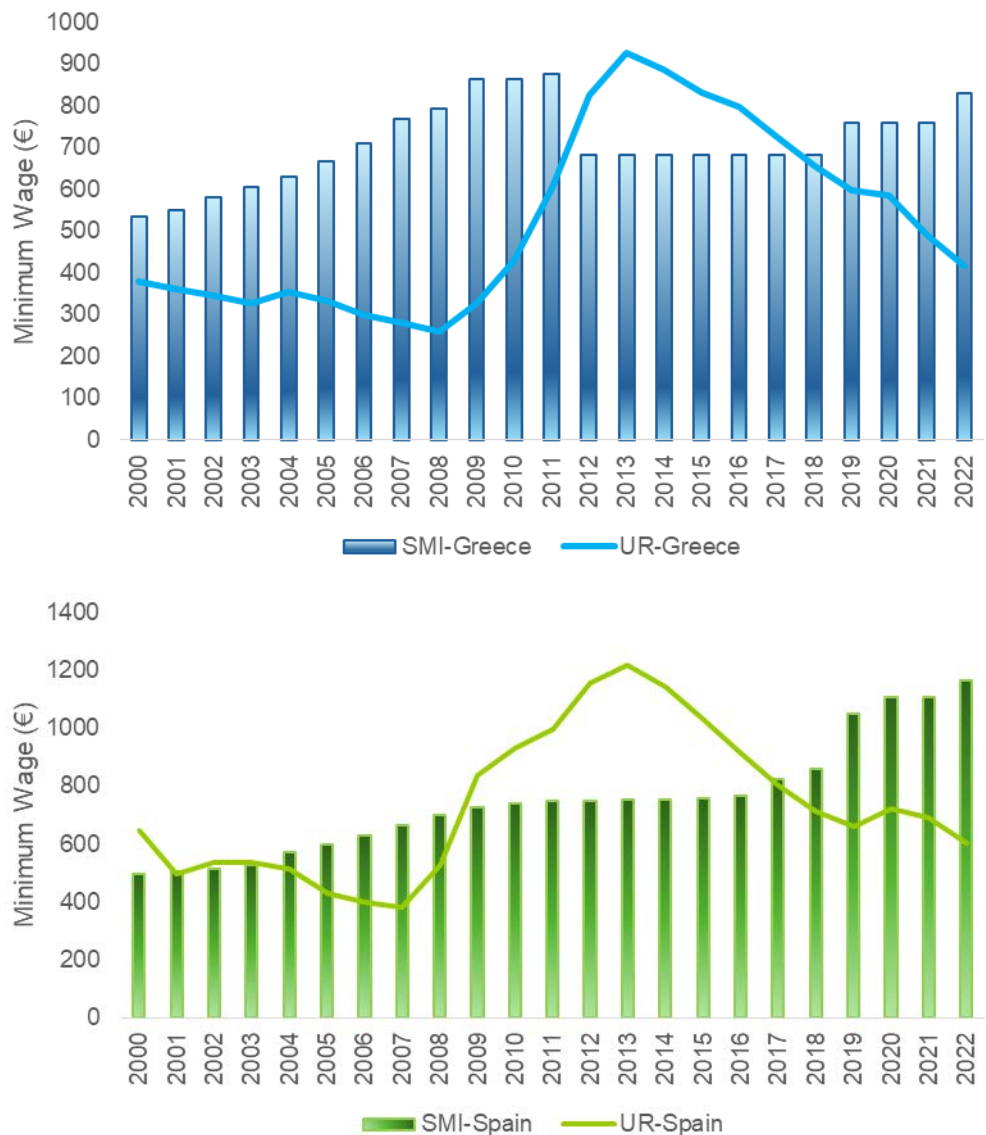
The minimum values of the deficit (variable that measures as a percentage, the negative difference between the revenues and expenditures of the total general government during a fiscal year over GDP) in Greece and Spain were -15.2 in 2009 and -11.6 in 2012 respectively. As for the highs of 0.9 in 2018 and 2.1 in 2006 of 0.9 in 2018). The average deficit has been higher in Greece (-6.4) than in Spain (-4.2). Figure 9 shows the behavior of the deficit and the total unemployment rate in both countries. It can be seen how there are years in which high deficit levels correspond to higher levels of unemployment (mainly the years covered by the financial crisis). This would be consistent with the implementation of expansive economic policies to alleviate the ravages of the crisis, which coincide with lower tax revenues because of economic paralysis.

**Figure 9.** *Evolution of the Unemployment Rate and Deficit in Greece and Spain (2000-2022)*



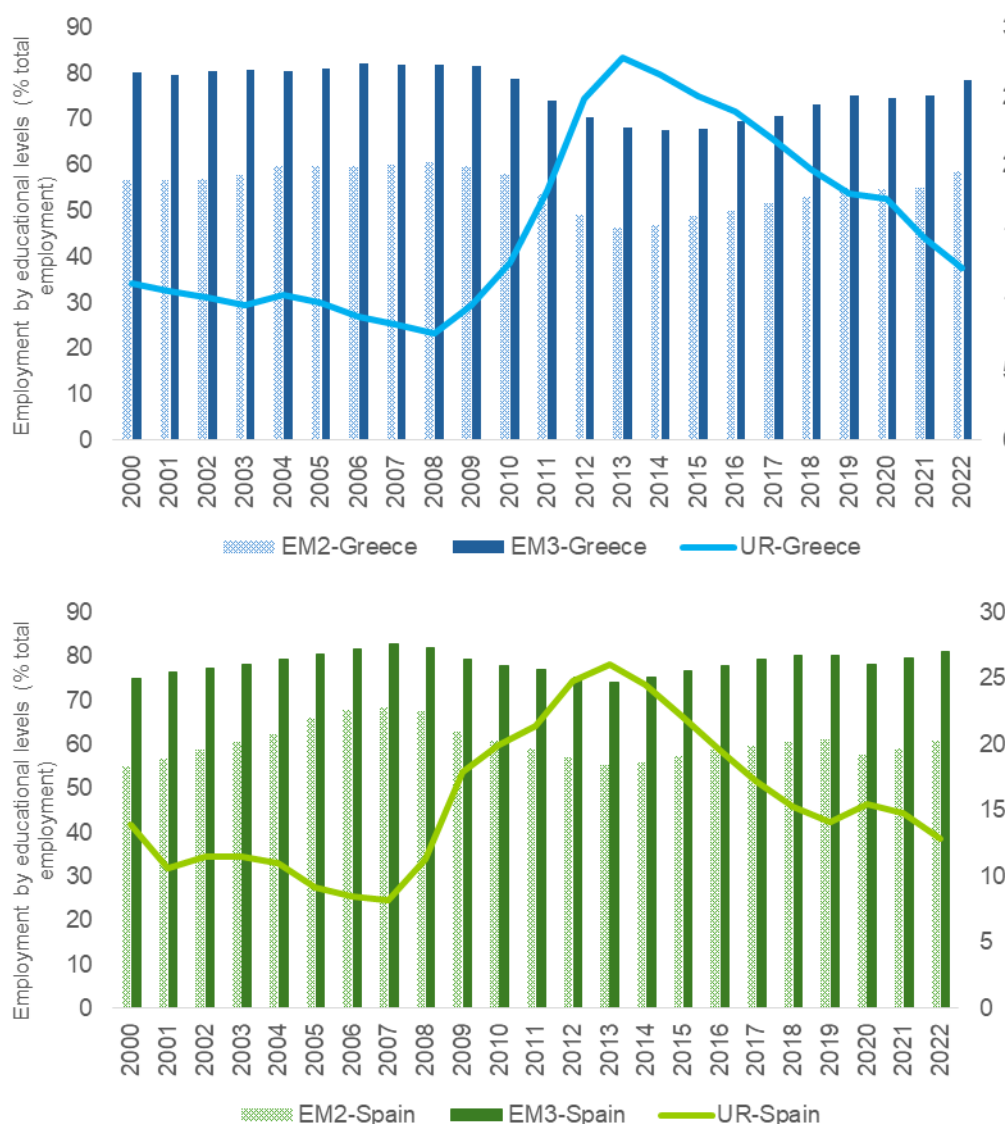
Source: Eurostat 2023.

The evolution of the minimum interprofessional wage is shown in Graph 10. This variable measures the amount established by governments to determine the minimum amount of gross annual salary that workers should receive. Looking at the statistics in Table 1, the minimum wage had its lowest value in both countries at the beginning of the 21<sup>st</sup> century (€333.9 in Greece and €495.6 in Spain). Since then, it has increased, reaching €831.8 in Greece and €166.7 in Spain in 2022. Therefore, while in Greece it has grown by approximately 56%, in Spain its growth has been much higher (133%). When compared with the evolution of unemployment, in principle, there is not much relation between the behavior of both variables, as can be seen in Figure 10.

**Figure 10.** Evolution of the Unemployment Rate and the Minimum Wage in Italy and Spain (2000 and 2022)

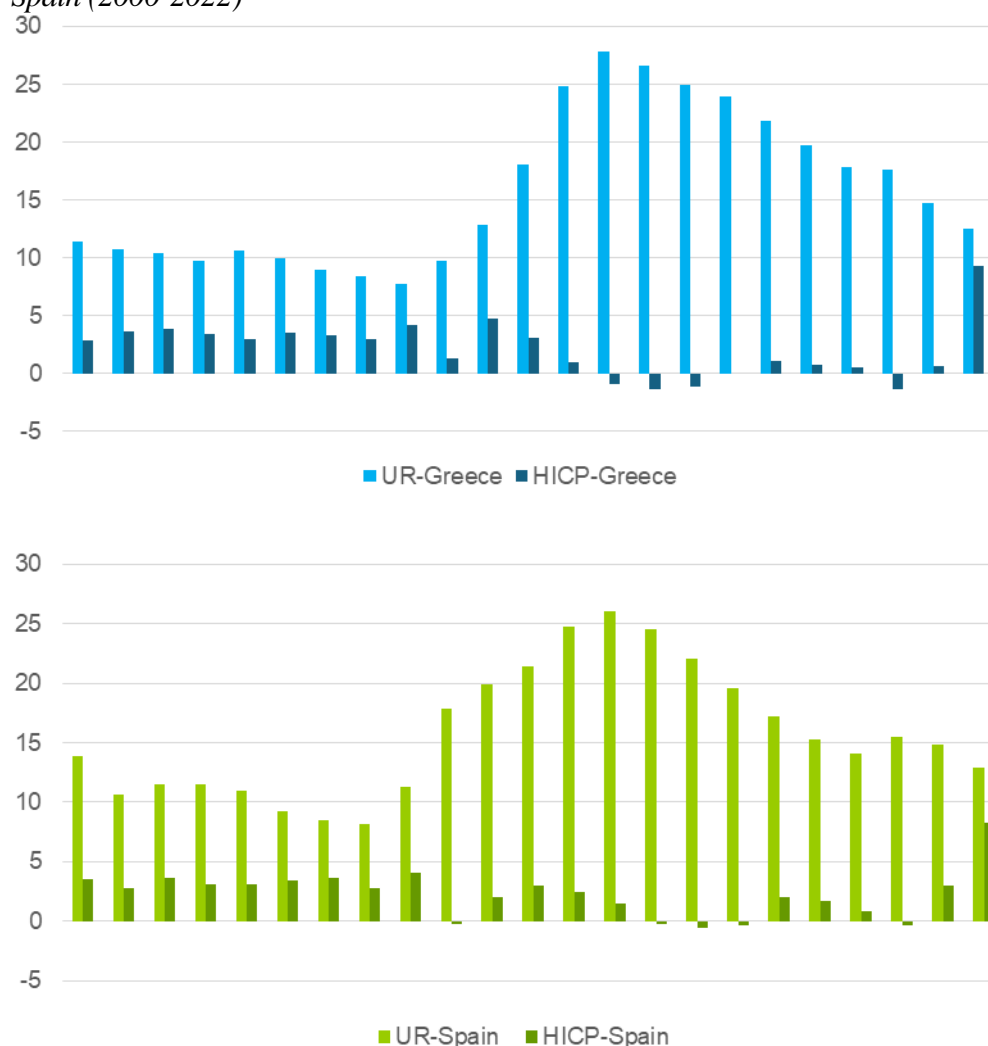
Source: Eurostat 2023.

As for the levels of education, for the two countries the maximums occur in tertiary education, university, doctorates (Em3), whose values are 62.1% (Greece) and 59% (Spain). Figure 11 shows the existence of some common pattern of behavior in these countries. Thus, for example, in both countries the Em3 level is higher than Em2 (secondary and post-secondary non-university level of education) and so is its average. During the period of the Great Recession, employment at these levels of education declined. Although they increased again after the crisis, they have not yet reached pre-financial crisis levels. In addition, it is observed that, in general, there is an inverse relationship between the unemployment rate and employment by the levels of education considered.

**Figure 11.** *Evolution of the Unemployment Rate and Education Levels in Greece and Spain (2000-2022)*

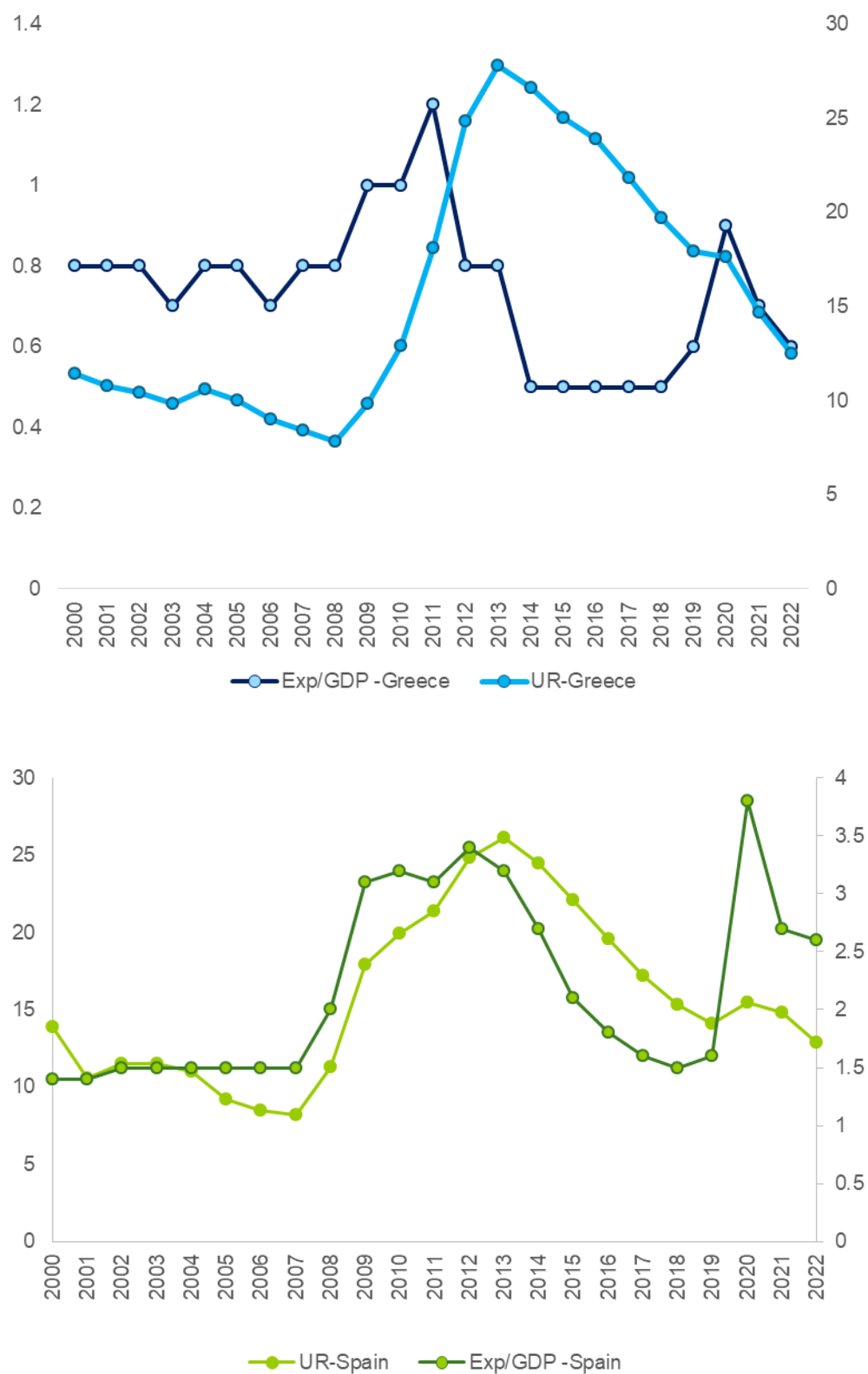
Source: Eurostat 2023.

Regarding inflation measured through the harmonized index of consumer prices (HICP), the minimum of -1.4 was reached in Greece in 2014, and in Spain in 2015 of -0.6. The maximums were reached in 2022 (9.3 in Greece and 8.3, in Spain). Average inflation has been quite similar in the two countries slightly exceeding 2%. In both countries inflation is positive asymmetric, which implies that there are more periods with above-average inflation. Figure 12 shows how some periods of high inflation are accompanied by low unemployment rates (as in the last six years) and others when they are not (as can be seen in the first values of the series).

**Figure 12.** *Evolution of the Unemployment Rate and the HICP in Greece and Spain (2000-2022)*

Source: Eurostat 2023.

Finally, with respect to unemployment expenditure as a percentage of GDP (Exp/GDP), it should be noted that according to the values observed in Table 1 and Graph 13, Spain's expenditure is higher than that of Greece. Thus, for example, the average expenditure on GDP in Spain is 2.2% while that of Greece is 0.7%. In both countries this expenditure is positively asymmetric, which implies that there are more periods in which the expenditure exceeds the average or that the dispersion of this expenditure with respect to its average is greater than in those in which it is less. In addition, Figure 13 shows that in the pre-crisis periods, when public spending as a percentage of GDP was higher, unemployment rates were lower. However, after the crisis and up to 2019, when Exp/GDP decreased, unemployment rates increased. In the year 2020, because of the COVID health crisis, the considerable increase in unemployment expenditure over GDP can be seen, reaching in Spain its maximum value (3.8%).

**Figure 13.** *Evolution of the Unemployment Rate and Unemployment Expenditure/GDP in Greece and Spain (2000-2022)*

Source: Eurostat 2023.

## Methodology

To explain which variables are most influencing unemployment in Greece and Spain, a balanced panel data model<sup>11</sup> will be estimated. This model allows us to express the unemployment rate of the country Greece or Spain at instant  $t$ , given by  $y_{it}$ , as a function of the characteristics of these countries in the sample period from 2000 to 2022, a time-stable idiosyncratic country component  $\alpha_i$  and a random noise  $u_{it}$ . Under the assumption of temporal and spatial uncorrelation, linearity and absence of heteroscedasticity of the random noise, the general equation of the model can be expressed as follows:

$$y_{it} = x'_{it}\beta + \alpha_i + \mu_{it} \quad \mu_{it} \sim N(0, \sigma^2), \text{Cov}(\mu_{it}, \mu_{js}) = 0 \quad \forall i \neq j, t \neq s \quad (1)$$

where  $i$  refers to Greece or Spain;  $t$  represents year.  $X_{it}$  are the explanatory variables. The idiosyncratic component is considered as a constant parameter to be estimated, that is, a different constant intercept for Spain or Greece if a panel data model with fixed effects is estimated. Whereas, if the model were random effects, then the noise of the model would be random, i.e.,  $\alpha_i + u_i$ , (Wooldridge 2006, Baltagi 2013, Pinzón 2015, Kripfganz 2016).

To determine whether there is a correlation between the regressors and  $\alpha_i$  and, therefore, to decide whether it is more appropriate to estimate a panel data model is with fixed or random effects, under the null hypothesis of random effects (RE) versus the alternative of fixed effects (FE), the Hausman statistic (quotient between the square of the difference of the two estimators and the difference of their variances) converges to a  $\chi^2_{NT}$ . This statistic is given by the following expression,

$$Q_{FE,RE} = (\widehat{\beta}_{FE} - \widehat{\beta}_{RE})' (\widehat{\sigma^2_{\beta FE}} - \widehat{\sigma^2_{\beta RE}})^{-1} (\widehat{\beta}_{FE} - \widehat{\beta}_{RE}) \sim \chi^2_{NT}$$

Finally, the Wooldridge (2006) test allows us to test the existence of first order autocorrelation and the Arellano and Bond (1991) test the hypothesis of no second order autocorrelation in the disturbances. If autocorrelation exists, it would be necessary to estimate a dynamic model. The Sargan test will also be used to check if the equations are correctly identified.

## Analysis of Total Unemployment Results for Greece and Spain

When analyzing the results of the Hausman test, Table 2, it is observed that the p-value  $< 0.05$ , which implies that the null hypothesis is rejected and, therefore, the most efficient estimator is the one obtained using fixed effects.

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<sup>11</sup>Stata was used to estimate the panel data model following the methodology proposed by Arellano and Bond (1991).



**Table 2.** *Different Contrast for Total Unemployment*

	Statistician [p-value]
<b>Hausman's test for fixed or random effects</b>	chi2(12)=30.70 [0.0022]
<b>Wooldridge</b>	F(1,1)=2.172 [0.3795]
<b>Arellano-Bond</b>	AR(1): -1.3737 [0.169]. AR(2): -1.1741 [0.240].
<b>Sargan Test</b>	$\chi^2_{29}=78.903$ [0.0001]

The autocorrelation test (Wooldridge test) in which the  $H_0$  is that there is no AR(1), indicates that there is no autocorrelation, since the p-value > 0.05. Similarly, the Arellano and Bond autocorrelation test shows that there is no autocorrelation either of order one or order two, which implies that it is not necessary to estimate a dynamic model.

Finally, the Sargan test indicates that there is no over-identification in the estimated equations since at p-value < 0.05.

Considering these contrasts, a balanced panel data model has been estimated as in equation (1) based on the Arellano and Bond method corrected for heteroscedasticity.

The results of the model estimation (see Table 3) corresponding to the unemployment rate for these two countries show that variables that are not exerting a significant influence on it are: productivity, public expenditure or educational levels.

**Table 3.** *Results of the Estimated Panel Data Model for Unemployment in Greece and Spain*

Variable	Coef.	Std. Error	z	P> z	[95% Conf. Interval]	
<b>OUT</b>	-.3278313	.1405266	2.33	0.020	-.6032583	-.0524043
<b>Inv</b>	-.3974305	.1311013	-3.03	0.002	-.6543844	-.1404767
<b>LPAT</b>	4.41979	2.338932	1.89	0.059	-.1644332	9.004013
<b>RP</b>	.0799558	.0487677	1.64	0.101	-.0156271	.1755387
<b>DF</b>	.1319635	.1083399	1.22	0.223	-.0803787	.3443058
<b>LMsi</b>	-9.10126	5.025388	-1.81	0.070	-18.95084	.7483195
<b>Em2</b>	-.0999963	.1761809	-0.57	0.570	-.4453045	.245312
<b>Em2</b>	-.3657137	.2912963	-1.26	0.209	-.936644	.2052167
<b>HICP</b>	-.2274522	.1378633	-1.65	0.099	-.4976592	.0427548
<b>ExpGDP</b>	1.886101	.6361037	2.97	0.003	6393612	3.132842
<b>D2009</b>	4589153	.9701081	0.47	0.636	-1.442462	2.360292
<b>D2020</b>	-3.618522	1.586468	-2.28	0.023	-6.727941	-.5091024
<b>_cons</b>	40.82931	22.11598	1.85	0.065	-2.51722	84.17584
Estimated covariances = 2		R-squared = 0.8511				
Estimated autocorrelations = 0		Wald chi2(12) = 863.86				
Estimated coefficients = 13		Prob > chi2 = 0.0000				

However, increases in variables<sup>12</sup> such as the output gap, investment, the minimum wage, or inflation (*ceteris paribus*), do contribute significantly to the decrease in the average unemployment rate. This may be because increases in investment or in the output gap may imply increases in economic activity that result in a decrease in the unemployment rate.

On the contrary, for example, if there is a 1% increase in the total active population, this implies that the average unemployment rate would increase by approximately 4.4% (*ceteris paribus*). This could imply that, as the population ages, the larger the active population becomes and the labour market does not have the capacity to generate sufficient employment (due to structural institutional factors such as the greater or lesser flexibility of the labour market, the selection of personnel carried out by companies that are uncertain about the correct performance of certain productive tasks).

Contrary to expectations, in this case, the level of education was not statistically significant. Even so, it is observed that the estimated parameters for the different levels of education are negative, with the one corresponding to the higher education level (Em3) being higher than the secondary level (Em2). This would imply that the higher the level of training or education, the higher the cognitive capacities to enter the labour market and, therefore, the lower the unemployment rate. For this reason, it is good to develop policies that favor the level of training and prevent school dropout.

The percentage of public spending as a percentage of GDP is significant, but its estimated parameter, contrary to expectations, is positive. This implies that the expenditures being made are not producing the expected results. However, it is necessary to find those measures that contribute to the generation of employment and therefore social welfare.

As for the behavior of the total unemployment rate in these two countries during the crises of the first decades of the 21<sup>st</sup> century, a different pattern can be observed. While during the Great Recession there has been an increase in the average total unemployment rate during the COVID, it has decreased by more than three percentage points. This may be because in these countries people who were in an ERTE situation have been counted as employed.

The estimated model is very reliable, since the estimated coefficient of determination is approximately equal to 0.85 (high and very close to 1).

### **Some Reflections on Unemployment in Greece and Spain**

As already mentioned, Greece and Spain are the two countries that have recorded higher unemployment rates than the rest of the EU countries in recent years.

The Greek unemployment rate is well above the European Union average due to a rigid labour market that makes the proportion of employed people lag far

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<sup>12</sup>Output and investment are statistically significant at a 5% significance level. If the significance level increases to 10%, then variables such as the minimum wage or inflation are also statistically significant.

behind other European countries. The higher unemployment rate among young people and women is of real concern in Greece, despite the recovery in employment and the reduction in unemployment experienced after COVID-19.

In recent years, the Greek economy has been characterized by low private investment due to a shortage of financing, a high proportion of small businesses and limited dynamism which have contributed to the fact that, at present, the Greek unemployment rate does not fall below 9% (European Commission 2023). It is no less true that these high levels of unemployment in Greece should be subtracted from that part of the population that may be counted as unemployed but remains in the informal economy. In many cases, Greek workers choose not to join the formal economy because they do not want to pay taxes (Papanikos 2015).

Following the health crisis, Greece has been gradually recovering thanks to a strong rebound in investment, a revival in tourism revenues, increased household spending and improved foreign investment (Bank of Greece 2021). In addition, the government has implemented a major public support program and, above all, has launched a very ambitious reform and investment plan called the Greek Recovery and Resilience Plan 2.0 (2021-2026)<sup>13</sup>, which involves improving competitiveness by prioritizing the improvement of the business climate, advancing digitalization, supporting the transition to the green economy and improving Greece's human capital.

It has also continued its reform program to address many structural problems of the Greek economy in several areas, including labour, bringing the Greek unemployment rate back to pre-2009 financial crisis levels. Among the wide-ranging reforms already undertaken or underway are, among others, the following: digitization and administrative simplification of the public sector, support for the development of digital infrastructure and systems in the private sector, reduction of regulation to support investment in key sectors such as tourism and research, incentives for entrepreneurs<sup>14</sup>, labour law reform to support teleworking and other more flexible work arrangements, curriculum reform to strengthen work practices, and further digitization of the education system in the provision of educational services and content<sup>15</sup>.

These measures will improve the match between workers and employers, develop professional skills, attract groups that currently have low labour force participation rates, and maximize the contribution of foreign-born workers. In fact,

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<sup>13</sup>This plan includes 68 different structural reforms and 106 investment projects. Government estimates that, if fully implemented, the plan will raise annual GDP growth by 1.2 percentage points. By 2026, it estimates that the plan will increase production by 6.9%, private investment by 20% and employment by 4%. The Plan was one of the first to be submitted and approved for access to the NextGenerationEU Facility. See Ministry of Finance of Hellenic Republic (2022), Bank of Greece (2022a) and Bank of Greece (2022b).

<sup>14</sup>Regarding to incentives for entrepreneurs and the self-employed, it should be noted that although this is a measure proposed by many governments to reduce unemployment, for it to be effective, the tax system must be revised, given that tax evasion or corruption can be a determining factor in the increase of self-employed workers. For a more detailed study, see Papanikos (2024).

<sup>15</sup>See a detailed study of the reforms undertaken by the Greek government in the labour market since the 2010 financial crisis until 2018 in Gatopoulos et al. (2021).

the model shows that the higher the educational levels of the labour force, the lower the unemployment rates.

A more detailed analysis of the employment situation in Greece shows that the Greek labour market has one of the largest mismatches between the skills of workers and the needs of employers, especially in the information technology sector where there is a shortage of skilled labour. These mismatches are also present at the regional level. In addition, the groups that find it most difficult to access employment are young workers, women, and new entrants to the labour force. Due to the high youth unemployment rate, many young people, including the most educated, emigrate. Meanwhile, the working-age population is declining due to net outward migration and population aging, as fertility has been low for a long time and continues to decline (OECD 2020).

Youth unemployment is a serious problem in Greece, which already had high and constant youth unemployment, but which, after the 2009 crisis, experienced a dramatic rise. Following this crisis and its intense recovery during the last few years, the Hellenic country has achieved significant recovery effects in its youth employment to reduce its youth unemployment rate by 10 points to 23.3% between June 2019 and June 2023, according to Eurostat data. Of concern within this rate is the 25-29 age group which has even higher unemployment than the 15-19 age group (Dendrinos 2014). Moreover, gender differences are more marked in Greece than in other EU countries, in fact the female activity rate is systematically lower compared to the male one and the unemployment rate is higher for women than for men in the Greek labour market (Bell and Blanchflower 2015). It should be noted that young Greeks delay their exit from the family nest, as do other young people in countries such as Spain and Portugal, which mitigates the costs of unemployment, but which in turn may restrict mobility leading to longer duration of unemployment (Tubadji 2012).

Like Greece, the Spanish economy has managed to gradually reduce the unemployment rate from the peak reached during the 2009 crisis, and after suffering the adverse effects of the pandemic, to close 2023 with an unemployment rate of 11.3%.

The Spanish labour market is also characterized as a dual market, represented by a group of workers with permanent contracts and high social protection and another group of temporary workers. Temporary workers have fewer rights and less job stability than workers with permanent contracts. In addition, temporariness can be an obstacle to the productivity and competitiveness of firms (although in the model it comes out with little significant influence on the unemployment rate), as temporary workers tend to have less training and experience than permanent workers, but also tend to be less motivated, and access less training within the firm (Damiani et al. 2017). The high temporality rate mainly affects young Spaniards. According to the OECD (2023) in 2021, seven out of ten under the age of 25 found a temporary job and this is even though the situation has improved after the last labour reform of Pedro Sánchez's government. Before this reform, Spain had the highest rate of temporary contracts among young people in Europe, which reduces training opportunities for young people without allowing them to progress to better jobs. Many young people work part-time not always by choice but

because of the difficulty of getting a full-time job or because of the sector in which they work, where this type of part-time contract predominates, such as the restaurant and hotel industry. However, Spain has one of the highest rates of people between 25 and 34 years of age with tertiary education in Europe (OECD 2023).

To combat the high unemployment rate of the Spanish economy, the Government carried out a labour reform in 2021 as a condition for accessing European funds. This reform had several objectives, one of the most important being to reduce the segmentation and duality of the Spanish labour market by introducing changes in collective bargaining where sectoral wage agreements prevail over company agreements and to improve the flexibility and capacity of companies to adapt to adverse shocks. In fact, the model shows how increases in the output gap contribute significantly to the reduction of the unemployment rate.

The reform reduced the number of contracts to three, so that workers now have permanent contracts which include permanent but discontinuous contracts, temporary contracts where the duration must be justified and expressly established, and training contracts which include work and study training contracts, as well as those leading to a degree (Gobierno de España 2021). To reduce temporary employment, the reform imposed additional social security contributions for contracts of less than 30 days and increased fines for companies that abuse fixed-term contracts.

However, it is difficult to differentiate how much of the job creation is due to labour reform and how much is due to post-pandemic economic growth. In addition, it is not yet clear whether the increase in discontinuous permanent contracts will continue and translate into better quality jobs (Doménech 2022).

Another of the measures that have characterized the Government of Pedro Sánchez has been to progressively increase the minimum interprofessional wage in Spain. Thus, minimum hours have been increased by 47% during the period 2018-2023. There are several studies that suggest that increasing the SMI can reduce job growth and lead to a higher probability of losing jobs depending on the type of worker. In fact, young people, women, and workers on temporary contracts are particularly affected by a reduction in hours and a higher probability of losing their job, although wage inequality has decreased especially for workers under 30 years of age (AIREF 2020).

In conclusion, Greece and Spain have higher unemployment rates than the rest of the EU countries due to the fact that both have highly rigid labour markets which, together with other structural problems, highlight the need for their governments to implement reform policies aimed, among others, at promoting investment, creating greater business dynamism, improving the training of the unemployed and reducing the growth of inflation, as shown by the results obtained in the estimation.

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## Historical Perspectives on Disability in Egypt: Attitudes and Policies

By Hamed Abdelreheem Ead\*

*This research paper examines the historical perspectives on disability in Egypt from ancient times to the modern era. The study uses a comparative approach to explore the attitudes and policies towards individuals with disabilities in different historical eras, including ancient Egypt, ancient Rome and Greece, ancient civilizations in China, India, and Persia, through the Islamic era, and the colonial period under French and British occupation. To conduct this research, a multi-disciplinary methodology was employed, including a review of historical literature and primary sources, as well as an analysis of art, architecture, and cultural artefacts. The research sheds light on the evolution of attitudes towards disability in Egypt, including the role of religion, philosophy, and social norms in shaping perceptions of disability. The study also examines policies and initiatives aimed at supporting individuals with disabilities throughout history, such as philanthropic organizations, schools, and rehabilitation centres. The research findings have significant implications for contemporary policies and practices concerning individuals with disabilities in Egypt and other countries. Understanding the historical context of disability in Egypt can inform current efforts to promote inclusion, accessibility, and human rights for people with disabilities.*

**Keywords:** *disability, Egypt, attitudes, policies, historical perspective, comparative approach*

### Introduction

Disability is a complex and multifaceted concept that has been shaped by various historical, cultural, and societal factors. Exploring the historical perspectives on disability provides valuable insights into the evolution of attitudes, policies, and practices surrounding individuals with disabilities. This research paper aims to examine the historical perspectives on disability in Egypt, spanning from ancient times to the modern era. By employing a comparative approach, the study explores attitudes and policies towards individuals with disabilities across different historical eras, including ancient Egypt, ancient Rome and Greece, ancient civilizations in China, India, and Persia, the Islamic era, and the colonial period under French and British occupation.

To conduct this research, a multi-disciplinary methodology was employed, incorporating a review of historical literature and primary sources, as well as an analysis of art, architecture, and cultural artefacts. By utilizing a comprehensive approach, this study aims to provide a nuanced understanding of the historical

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\*Professor, Cairo University, Egypt.

context of disability in Egypt and its implications for contemporary policies and practices.

The study focuses on the evolution of attitudes towards disability in Egypt, taking into account the influence of religion, philosophy, and social norms throughout history. In ancient Egypt, physical disabilities and body deformities were often perceived as divine attributes, granted by the gods themselves. This belief was reflected in the representation of certain gods with misshapen bodies or as dwarfs. Remarkably, ancient Egyptian society exhibited tolerance towards disability, as evidenced by the inclusion of individuals with disabilities, including dwarfs and malformed persons, among the household of kings and high officials. Moral instructions emphasized respect for people with disabilities, emphasizing the need to avoid teasing or causing hardship.

However, attitudes towards disability underwent significant changes during the Islamic era. Disability was sometimes viewed as a form of punishment or a curse from God. The impact of colonialism on disability in Egypt was also substantial, as British policies reinforced negative attitudes and perpetuated the marginalization of individuals with disabilities.

Throughout history, various policies and initiatives were implemented in Egypt to support individuals with disabilities. Specialized institutions, including schools and rehabilitation centres, were established to provide education, training, and rehabilitation services. However, these efforts faced challenges related to funding, staffing, and accessibility, resulting in limited access to services for many individuals with disabilities.

The research findings have significant implications for contemporary policies and practices concerning individuals with disabilities, not only in Egypt but also in other countries. By understanding the historical context of disability in Egypt, policymakers and practitioners can gain insights into the complex dynamics that have shaped attitudes and policies over time. This knowledge can inform and improve current efforts to promote inclusion, accessibility, and human rights for individuals with disabilities.

So we can conclude that this research provides valuable insights into the evolution of attitudes, policies, and practices towards individuals with disabilities. The study employs a comparative approach, encompassing different historical eras and employing a multi-disciplinary methodology. Understanding the historical context of disability in Egypt can inform contemporary efforts to promote inclusion, accessibility, and human rights for people with disabilities. By building upon the lessons of the past, policymakers and practitioners can work towards a more inclusive and equitable society for all individuals, regardless of their

### **Historical Perspectives on Disability in Egypt**

Scholars have studied the history of disability in Egypt, which is a complicated and diverse subject. This study intends to investigate how policies and attitudes toward people with disabilities have changed in Egypt throughout several historical eras, providing insight into the underlying causes of these viewpoints.

We obtain a greater grasp of the historical setting and its implications for disability studies within education by critically analyzing and contrasting stories from the Greek, Islamic, and Egyptian eras as well as the effects of colonialism.

Nasser (2013), Omran (2019), El-Sayed (2018), Ismail (2010), and Rizk (2009a, b) have all conducted scholarly studies that have yielded insightful information on the history of disability in Egypt. Disability was seen as a normal aspect of human variation rather than as a bad thing in ancient Egypt.

But with time, sentiments in Egypt toward disability have changed. Perspectives shifted throughout the Islamic era when people with disabilities were occasionally seen as a kind of divine retribution or a curse. El-Sayed (2018) draws attention to the measures found in Islamic law that provide for the protection and care of people with disabilities, but she also points out certain restrictions and difficulties. Another important point to think about is how colonialism affected people with disabilities in Egypt. Ismail (2010) investigates how the marginalization of people with disabilities and unfavorable perceptions around disability were sustained by colonial practices.

Social conventions, philosophy, and religion have all had a significant impact on how people in Egypt see disabilities. According to El-Sayed's (2018) analysis, Islamic law offers a framework for providing care for people with disabilities that is based on the values of justice and compassion. Religion was a powerful force in ancient Egypt, where people believed that people with disabilities had a unique bond with God (Nasser 2017a, b). According to Gharib (2012), social norms have shaped perceptions of disability, which are frequently the consequence of ignorance or a fear of the unknown. Mahran and Kamal's (2016) examination of how physical disabilities are portrayed in ancient Egyptian art adds to our knowledge of societal perceptions of disability. Their study of Old Kingdom tomb scenes shows that rather than being stigmatized, people with disabilities were assigned particular tasks and responsibilities in ancient Egyptian society, highlighting the acceptance and inclusion of these people.

Furthermore, Laes (2017) offers a thorough analysis of impairment and disability throughout antiquity, including ancient Egypt. Through examining disability in a variety of societies, cultures, and historical periods, Laes' work illuminates the subject from a wider angle. The chapters in the book are organized into parts covering many communities and civilizations, such as Mesopotamia, Israel, Persia, Egypt, India, China, Greece, and Rome, as well as the Hittites.

The academic materials consulted for this study offer a comprehensive grasp of Egypt's disability history and the forces that have influenced attitudes and laws throughout the years. It emphasizes the importance of religion, philosophy, and social conventions in illuminating cultural views about disability via the lens of ancient Egyptian art. Even if there has been some improvement recently, prejudice and unfavourable attitudes still pose major obstacles for people with disabilities in contemporary Egypt. Informed attempts to address these issues and encourage greater inclusion and acceptance of people with disabilities in Egyptian society must take into account historical perspectives on disability.

By combining the study results from Nasser, Omran, El-Sayed, Ismail, Rizk, and Laes, we can have a thorough grasp of the historical viewpoints about

disability in Egypt. These studies emphasize how religion, philosophy, and social conventions have shaped changing views about disability. They also show how colonialism has impacted how people with disabilities are perceived and treated.

### **Disabilities in Ancient Egypt**

Ancient Egyptian society had a relatively accepting attitude toward people with disabilities. People with disabilities were often depicted in Egyptian art, and some were even venerated as gods. Ancient Egyptian beliefs about disabilities were influenced by their religious beliefs. The Egyptians believed that the gods could bestow physical differences and disabilities as divine attributes and that people with disabilities were not cursed or punished for past sins. They believed that everyone had a role to play in society, regardless of physical ability, and that people with disabilities deserved respect and care.

People with disabilities were often depicted in Egyptian art, such as the statue of Seneb, a high-ranking official in the court of Pharaoh Djoser during the Third Dynasty. Seneb was depicted with a curved spine, a protruding belly, and short legs, but despite his physical differences, he was depicted as a respected and dignified member of the court. Other examples of people with disabilities in Egyptian art include the dwarf Per-Nefers, who was a court official during the Sixth Dynasty, and the high official Khnumhotep, who was depicted with a club foot.

In ancient Egyptian society, people with disabilities were often integrated into the community and given opportunities to contribute to society. They were not shunned or excluded from public life and were often employed as scribes, musicians, or craftsmen. Ancient Egyptian moral teachings stressed respect for people with disabilities and emphasized the importance of treating them with kindness and understanding.

In general, ancient Egyptian society was quite accommodating of those with impairments and understood their inherent value. Their art and moral teachings reflect this acceptance and inclusion in society and offer a crucial historical framework for comprehending how Egyptians with disabilities have been treated throughout history.

In ancient Egypt, people with disabilities were often employed in various professions and trades such as:

**Scribes:** People with disabilities, including those who were blind or had physical impairments, were often trained as scribes. This was a prestigious profession in ancient Egypt, and scribes were responsible for recording information, writing letters, and keeping track of accounts.

**Musicians:** People with disabilities were also employed as musicians in ancient Egypt. For example, a blind musician named Harkhuf is mentioned in inscriptions from the Old Kingdom and was highly respected for his musical abilities.

**Craftsmen:** People with disabilities were also employed as craftsmen in ancient Egypt. For example, a famous statue of the god Ptah-Sokar-Osiris depicts the god with a club foot, which may have been intended to show that people with disabilities could still be skilled craftsmen.

**begging:** While not employment per se, some people

with disabilities in ancient Egypt resorted to begging for alms. However, even beggars were often respected and given alms as a form of charity. Overall, people with disabilities in ancient Egypt were not excluded from public life or employment opportunities. They were given the chance to contribute to society and were respected for their skills and abilities, regardless of their physical differences.

There is limited information on laws or policies in ancient Egypt that specifically protected the rights of people with disabilities. However, there is evidence to suggest that the ancient Egyptians had a sense of social justice and compassion toward people with disabilities.

For example, several ancient Egyptian texts, such as the "Instructions of Ani," stressed the importance of treating people with disabilities with compassion and respect. These texts emphasized the moral obligation of individuals to help those in need, including people with disabilities.

In addition, the ancient Egyptians believed in *ma'at*, a concept of justice and order that emphasized the importance of treating others fairly and with respect. This included treating people with disabilities as equal members of society, and not discriminating against them based on their physical differences.

Furthermore, there is evidence to suggest that the ancient Egyptians had some form of the healthcare system that provided medical treatment to people with disabilities. For example, medical texts from ancient Egypt describe various treatments and remedies for physical ailments and conditions, including those that affected mobility or physical ability.

While there may not have been specific laws or policies in ancient Egypt that protected the rights of people with disabilities, the moral teachings and cultural values of the society emphasized respect for all individuals, including those with physical differences. This suggests that people with disabilities were accepted and integrated into ancient Egyptian society, and were not subjected to the same levels of discrimination and exclusion that were seen in other cultures throughout history.

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The historical analysis of disability in Ancient Egypt suggests that the attitudes and treatment of individuals with disabilities were generally positive and accepting. The ancient Egyptians believed that disabilities were not a punishment or a curse, but rather a divine attribute bestowed by the gods. As a result, people

with disabilities were often depicted in Egyptian art and sometimes even venerated as gods.

Despite physical differences, people with disabilities were integrated into ancient Egyptian society and given opportunities to contribute to the community. They were not excluded from public life or employment opportunities and were often employed as scribes, musicians, or craftsmen. This suggests that ancient Egyptian society recognized the inherent worth and value of people with disabilities and did not discriminate against them based on their physical differences.

Furthermore, while there may not have been specific laws or policies in ancient Egypt that protected the rights of people with disabilities, the moral teachings and cultural values of the society emphasized respect for all individuals, including those with physical differences. This suggests that people with disabilities were accepted and integrated into ancient Egyptian society, and were not subjected to the same levels of discrimination and exclusion seen in other cultures throughout history. According to the historical analysis of disability in ancient Egypt, society generally accepted and valued people with impairments, as is evidenced by their art, moral precepts, and treatment of those who were disabled.

### **Disabilities in Ancient Greek and Roman Societies**

Contrasting with the relatively accepting attitudes toward disabilities in ancient Egypt, ancient Greek society exhibited a more exclusionary perspective. Penrose (2015) explores the question of whether a categorization of disability existed in ancient Greece. He argues that close readings of ancient Greek authors, such as Lysias and Plutarch, suggest that some Greeks did construct a social category of disability.

In ancient Greece, the term "ἀδύνατος" (adynatos) was used to refer to disabled individuals, who were often excluded from military, political, and religious roles in Athens and elsewhere. This exclusion from public life and education marginalized individuals with disabilities, denying them opportunities to participate in public affairs or contribute to the economy. Physical disabilities were viewed as indicators of weakness and carried a significant social stigma, while intellectual disabilities were often interpreted as divine curses.

However, the treatment of disabilities varied among different Greek city-states. Penrose notes that the Spartans, for example, chastised those who did not fight, even if they had impairments while praising those who "overcame" their disabilities. This contrast highlights the significance of disability in understanding inter-Greek ethnic identity.

While a distinct model of the medicalization of disability similar to the modern era may not have existed in ancient Greece, Penrose suggests that "models of pity, charity, and categorization" were present to some extent. Some temples and sanctuaries, such as the Temple of Asclepius in Epidaurus and the Temple of Apollo at Delphi, provided care and support for people with disabilities, offering medical treatment and healing.

Penrose emphasizes the importance of bringing a disability studies perspective to the field of classics to gain new insights into the ancient world. By understanding how the Athenians and Spartans treated disabled individuals, researchers can gain a deeper understanding of inter-Greek ethnicity. Acknowledging past ableism can also aid in cultivating understanding and empathy towards others in the present. Penrose's article contributes to the discourse on disability by examining its presence and societal treatment in ancient Greece. It highlights the existence of a social category of disability in ancient Greek society, albeit with variations among different city-states. The article underscores the importance of understanding disability in the ancient world to shed new light on historical contexts and foster empathy in the present.

Moreover, Sneed (2018) and Rose (2004) have made significant contributions to our understanding of disability. Sneed's work, particularly her book "Disability in Classical Athens," explores the social, cultural, and political aspects of disability in ancient Athens. Rose's research on disability in ancient Greece, as presented in her book "The Staff of Oedipus: Transforming Disability in Ancient Greece," analyses the portrayal of disability in Greek myth and drama.

### **The Historical Analysis of Disability in Ancient Greek and Roman Societies**

The historical analysis of disability in ancient Greek and Roman societies suggests that attitudes and treatment towards individuals with disabilities were often exclusionary and varied. In ancient Greece, physical disabilities were often stigmatized and seen as a sign of weakness, while intellectual disabilities were considered a curse from the gods. As a result, people with disabilities were often excluded from public life and education and were not given opportunities to contribute to society.

In contrast, ancient Roman society had a fascination with physical deformities and considered them to be wondrous. People with physical differences were sometimes exhibited in public as curiosities and were even celebrated in art and literature. However, people with intellectual disabilities were often excluded from public life and considered a burden on society. This reflects the complex and varied attitudes towards disability throughout history.

The historical evidence suggests that both ancient Greek and Roman societies had limited provisions for the care and education of people with disabilities. In ancient Greece, some temples and sanctuaries, such as the Temple of Asclepius in Epidaurus and the Temple of Apollo at Delphi, provided care and support for people with disabilities. These institutions offered medical treatment and healing for various physical and mental conditions.

Similarly, in ancient Rome, there were charitable organizations known as *collegia* that provided support and assistance to various groups, including people with disabilities. These organizations were often based on a shared profession or trade and supported members in need. Additionally, some wealthy individuals established private institutions, or hospices, to provide care and support for people

with disabilities. These hospices were often staffed by trained individuals who offered medical care and other forms of assistance.

However, it is important to note that while some institutions and organizations provided support and assistance to people with disabilities, these provisions were often limited in scope and were not accessible to all. The historical analysis of disability in ancient Greek and Roman societies underscores the need for greater awareness and advocacy for disability rights. The contrasting attitudes towards disability throughout history highlight the importance of understanding and challenging societal biases to promote inclusivity and equal opportunities for individuals with disabilities.

### **Disabilities in Islamic Times**

In Islamic times, Egypt was ruled by various Islamic dynasties, including the Fatimids, Mamluks, and Ottomans. Islamic teachings and values had a significant influence on attitudes toward people with disabilities in Egypt during this period.

Islamic teachings emphasize the inherent worth and dignity of all human beings, regardless of their physical or mental abilities. Muslims are encouraged to show compassion and mercy toward all people, including people with disabilities. The Prophet Muhammad himself is said to have shown kindness and respect toward people with disabilities, and his example has been followed by many Muslims throughout history.

Islamic scholars and institutions also made significant contributions toward the education and care of people with disabilities. For example, the famous physician and philosopher al-Razi (known as Rhazes in the West) wrote extensively on the subject of disabilities and developed innovative treatments for various conditions. In addition, Islamic institutions such as waqfs (charitable endowments) and madrasas (schools) provided support and education to people with disabilities.

One notable example of an Islamic institution that supported people with disabilities was the Dar al-Ma'mun Hospital in Cairo, founded in the 9th century by the Fatimid caliph al-Ma'mun. This hospital provided medical care and rehabilitation services to people with disabilities, including those with vision and hearing impairments.

Overall, the Islamic view of disabilities emphasized compassion and respect for people with disabilities, and encouraged the provision of education and care to support their well-being. Islamic scholars and institutions made significant contributions toward advancing knowledge and care for people with disabilities, which had a lasting impact on attitudes and practices toward people with disabilities in Egypt and beyond.

In addition to the Dar al-Ma'mun hospital, other Islamic institutions in Egypt provided support and care for people with disabilities during Islamic times. Here are a few examples: such as: Waqfs: they were charitable endowments that were established by individuals or organizations to support various social and religious causes. Many waqfs in Egypt were established to support people with disabilities



and provided funding for hospitals, schools, and other institutions that provided care and education for people with disabilities. Madrasas: Madrasas were Islamic schools that provided education in various subjects, including religious studies, science, and the arts. Some madrasas in Egypt were specifically established to provide education for people with disabilities, and were staffed by teachers who were trained to work with students with different abilities. Sufi orders: Sufi orders were religious organizations that emphasized spiritual practices and teachings. Some Sufi orders in Egypt provided support and care for people with disabilities, and were known for their compassionate and inclusive approach to society. Mosques: Mosques were not only places of worship, but also served as centers of community life in Islamic societies. Some mosques in Egypt provided care and support for people with disabilities, and offered services such as medical treatment, education, and vocational training. Overall, Islamic institutions in Egypt played an important role in providing support and care for people with disabilities during Islamic times. These institutions reflected the Islamic values of compassion and respect for all individuals, and provided much-needed services and opportunities for people with disabilities to thrive and contribute to society.

Several notable individuals contributed to the establishment of institutions that supported people with disabilities in Islamic Egypt. Here are a few examples of them: Al-Ma'mun: Al-Ma'mun was a Fatimid caliph who founded the Dar al-Ma'mun hospital in Cairo in the 9th century. This hospital provided medical care and rehabilitation services to people with disabilities, including those with vision and hearing impairments. Al-Razi: Al-Razi (also known as Rhazes) was a famous physician and philosopher who lived in the Islamic Golden Age. He wrote extensively on the subject of disabilities and developed innovative treatments for various conditions. His work had a lasting impact on medical knowledge and practice in Egypt and beyond. Ibn Sina: Ibn Sina (also known as Avicenna) was another famous philosopher and physician who lived in the Islamic Golden Age. He wrote a seminal work on medicine, the Canon of Medicine, which was widely used as a medical textbook in Islamic societies. His work also had a significant influence on the development of medical knowledge and practice in Egypt and beyond. Al-Ghazali: Al-Ghazali was a famous Islamic philosopher and theologian who lived in the 11th century. He emphasized the importance of compassion and empathy toward all individuals, including people with disabilities, and his teachings had a significant influence on Islamic Attitudes toward disabilities.

These individuals, and many others like them, played an important role in advancing knowledge and care for people with disabilities in Islamic Egypt. Their contributions helped establish institutions and practices that supported the well-being and inclusion of people with disabilities, and had a lasting impact on attitudes and practices toward disability in Egypt and beyond.

The historical analysis of disability in Islamic times in Egypt reveals that Islamic teachings and values had a significant influence on attitudes and treatment towards people with disabilities. Islamic teachings emphasize the inherent worth and dignity of all human beings, including those with disabilities, and encourage compassion and respect for all individuals. This view of disabilities had a lasting impact on attitudes and practices in Egypt and beyond.

Islamic scholars and institutions also made significant contributions towards the education and care of people with disabilities. Prominent figures such as al-Razi, Ibn Sina, and al-Ghazali developed innovative treatments and emphasized the importance of compassion and empathy towards people with disabilities. Islamic institutions such as waqfs, madrasas, Sufi orders, and mosques provided support and care for people with disabilities, including medical care, education, vocational training, and rehabilitation services.

One notable example of an Islamic institution that supported people with disabilities was the Dar al-Ma'mun Hospital in Cairo, founded in the 9th century by the Fatimid caliph al-Ma'mun. This hospital provided medical care and rehabilitation services to people with disabilities, including those with vision and hearing impairments. Additionally, Waqfs were established to support people with disabilities, providing funding for hospitals, schools, and other institutions that provided care and education. Overall, the Islamic view of disabilities emphasises the importance of compassion and respect for people with disabilities and encourages the provision of education and care to support their well-being. Islamic scholars and institutions made significant contributions towards advancing knowledge and care for people with disabilities, which had a lasting impact on attitudes and practices in Egypt and beyond.

### **Disabilities during the 18<sup>th</sup> and 19<sup>th</sup> Centuries**

During the 18<sup>th</sup> and 19<sup>th</sup> centuries, Egypt was under the rule of various colonial powers, including the French and the British. The impact of colonialism on attitudes toward people with disabilities in Egypt was complex and included both positive and negative influences.

On the one hand, colonialism brought new ideas and technologies to Egypt, including advances in medicine and rehabilitation. European doctors and missionaries established hospitals and clinics in Egypt that provided care and treatment for people with disabilities and introduced new approaches to education and training.

On the other hand, colonialism also brought with it negative attitudes toward people with disabilities. European colonizers often viewed people with disabilities as inferior and in need of “civilizing” and “modernizing”. This led to a rise in eugenicist thinking and practices, which aimed to eliminate disabilities through selective breeding and sterilization.

Despite these negative attitudes, there were also many Egyptians who were committed to improving the lives of people with disabilities during this period. Charitable institutions and schools for people with disabilities began to emerge, providing care, education, and vocational training to people with different abilities.

One notable example of a charitable institution was the School for the Blind in Cairo, which was established in 1888 by the Egyptian government with the support of European philanthropists. This school provided education and vocational training for blind children and was staffed by teachers who were trained to work with students with visual impairments.

Overall, the impact of colonialism on attitudes toward people with disabilities in Egypt was complex and included both positive and negative influences. While colonialism introduced new ideas and technologies that improved the lives of people with disabilities, it also brought with it negative attitudes and practices that had a lasting impact on disability rights and inclusion in Egypt.

During the 18th and 19th centuries, vocational training programs for people with disabilities in Egypt were often focused on developing skills in traditional crafts and trades. Here are some examples of vocational training programs that were offered during this period: Weaving: Weaving was a traditional craft in Egypt, and many vocational training programs for people with disabilities focused on developing skills in this area. Blind individuals, in particular, were often trained as weavers, as their sense of touch and spatial awareness could be used to create intricate patterns and designs. Carpentry: Carpentry was another traditional craft that was often taught to people with disabilities in vocational training programs. People with physical disabilities, in particular, could learn to create furniture and other wooden objects with the use of specialized tools and techniques. Sewing: Sewing and embroidery were also popular vocational training programs for people with disabilities, particularly for women. Blind individuals were often trained as seamstresses, as their sense of touch could be used to create intricate designs and patterns. Metalworking: Metalworking was another traditional craft that was sometimes taught to people with disabilities in vocational training programs. People with physical disabilities could learn to create objects such as jewellery, utensils, and decorative items using metalworking techniques. Overall, vocational training programs for people with disabilities during this period were focused on developing practical skills in traditional crafts and trades. These programs provided opportunities for people with disabilities to learn new skills, earn a living, and contribute to their communities, despite the challenges they faced.

The historical analysis of disability in Egypt during the 18th and 19th centuries reveals a complex and nuanced picture, shaped by the impact of colonialism and the emergence of vocational training programs and charitable institutions for people with disabilities.

Colonialism brought both positive and negative influences towards people with disabilities. The introduction of new ideas and technologies in medicine and rehabilitation improved the lives of people with disabilities, while negative attitudes towards people with disabilities led to eugenicist thinking and practices aimed at eliminating disabilities through selective breeding and sterilization.

Despite these negative attitudes, Egyptians were committed to improving the lives of people with disabilities during this period. Charitable institutions and schools for people with disabilities began to emerge, providing care, education, and vocational training to people with different abilities. For example, the School for the Blind in Cairo, established in 1888 with the support of European philanthropists, provided education and vocational training for blind children.

Vocational training programs for people with disabilities during this period were focused on developing practical skills in traditional crafts and trades such as weaving, carpentry, sewing, and metalworking. These programs provided opportunities for people with disabilities to learn new skills, earn a living, and

contribute to their communities. Overall, the historical analysis of disability in Egypt during the 18th and 19th centuries reveals a complex and evolving picture, shaped by the interplay of various social, cultural, and political factors. While colonialism had both positive and negative influences, Egyptians were committed to improving the lives of people with disabilities, and vocational training programs and charitable institutions provided opportunities for people with disabilities to learn new skills, earn a living, and contribute to their communities.

### **Disabilities in Contemporary Egypt**

People with disabilities continue encountering substantial obstacles in modern-day Egypt that prevent them from fully participating in society. Here are some of the problems and difficulties that Egyptians with disabilities are now dealing with

**Lack of accessibility:** Many public spaces and buildings in Egypt are not accessible to people with disabilities, including those with physical disabilities, visual impairments, and hearing impairments. This limits their ability to participate in public life and access essential services such as education, healthcare, and employment.

**Stigma and discrimination:** People with disabilities in Egypt often face stigma and discrimination, which can limit their opportunities and access to resources. Negative attitudes toward people with disabilities can also affect their mental health and well-being.

**Limited access to education and employment:** People with disabilities in Egypt face significant barriers to education and employment. Many schools and universities do not have the resources or accommodations to support students with disabilities, and many employers are unwilling to hire people with disabilities.

Several programs and services support people with disabilities in Egypt such as

**Rehabilitation services:** Several rehabilitation centres in Egypt provide medical treatment and therapy for people with disabilities, including physical therapy, occupational therapy, and speech therapy. These services can help people with disabilities improve their mobility, communication, and overall quality of life.

**Vocational training programs:** Several vocational training programs in Egypt provide skills training and employment opportunities for people with disabilities. These programs can help people with disabilities develop their skills to earn a living and contribute to their communities.

**Assistive technology:** Several organizations in Egypt provide assistive technology devices and services for people with disabilities, including wheelchairs, hearing aids, and communication devices. These devices can help people with disabilities overcome barriers to participation in society and improve their independence and quality of life.

**Awareness campaigns:** Several non-governmental organizations and civil society groups in Egypt are working to raise awareness about the rights and needs of people with disabilities. These campaigns aim to reduce stigma and discrimination and promote greater social inclusion and equality for people with disabilities.

**Legal advocacy:** Several organizations in Egypt are working to advocate for legal reforms that promote the rights and inclusion of people with disabilities. For example, the Egyptian Organization for Human Rights has advocated for

implementing the 2018 Disability Law, which aims to protect the rights of people with disabilities and ensure their full participation in society.

These programs and services are critical in supporting the needs and rights of people with disabilities in Egypt. However, there is still much work to be done to ensure that these services are accessible and effective for all individuals with disabilities and that they are supported by policies and practices that promote inclusion and equality. Despite these challenges, there are efforts being made by the government, non-governmental organizations, and civil society to address the issues faced by people with disabilities in Egypt. The government has passed legislation aimed at promoting the rights and inclusion of people with disabilities, including the 2018 Disability Law. Non-governmental organizations and civil society groups have developed programs and services aimed at supporting people with disabilities, including vocational training programs, rehabilitation services, and advocacy campaigns. International organizations such as the United Nations and the World Health Organization are working with the government and local organizations to promote the rights and well-being of people with disabilities in Egypt (WHO 2011, 2021). It is important to continue to promote the inclusion and rights of people with disabilities in Egypt. This can be achieved through increased awareness and education, advocacy for policy and legal reforms, and the development of programs and services that support the needs of people with disabilities. By working together, we can create a more inclusive and equitable society for all.

The historical analysis of disability in contemporary Egypt reveals the ongoing challenges faced by people with disabilities in accessing education, employment, and public spaces.

Despite some progress, including the passing of the 2018 Disability Law aimed at promoting the rights and inclusion of people with disabilities in Egypt, people with disabilities still encounter significant obstacles in fully participating in society. One major challenge is the lack of accessibility to public spaces and buildings, limiting their ability to access essential services and participate in public life.

Stigma and discrimination also continue to be a significant issue for people with disabilities in Egypt, limiting their opportunities and access to resources. Negative attitudes toward people with disabilities can also affect their mental health and well-being.

Limited access to education and employment also continues to be a significant barrier for people with disabilities in Egypt. Many schools and universities do not have the resources or accommodations to support students with disabilities, and many employers are unwilling to hire people with disabilities.

However, efforts are being made by the government, non-governmental organizations, and civil society to address these issues. Rehabilitation centres, vocational training programs, assistive technology devices and services, awareness campaigns, and legal advocacy are all critical in supporting the needs and rights of people with disabilities in Egypt. Overall, the historical analysis of disability in contemporary Egypt reveals the ongoing challenges faced by people with

disabilities in accessing education, employment, and public spaces, and the need for continued efforts to promote inclusion and equality for all.

### **Comparative Analysis of Attitudes and Policies towards Disability in Different Historical Eras**

Attitudes towards disability in Egypt have evolved, with different historical eras characterized by distinct perspectives on disability. In ancient Egypt, for example, individuals with disabilities were often viewed as having a special connection to the divine, and were depicted in art in positions of authority or religious significance (Nasser 2017a, b). However, during the Islamic Golden Age, disability was often seen as a punishment from God, and individuals with disabilities were often marginalized and excluded from society (Omran 2019). In the modern era, attitudes towards disability have become more inclusive, with policies and initiatives aimed at promoting the rights and inclusion of individuals with disabilities (Gharib 2012).

### **Examination of the Evolution of Attitudes towards Disability in Egypt**

The evolution of attitudes towards disability in Egypt can be attributed to a variety of factors, including religion, philosophy, and social norms. For example, in ancient Egypt, religion played a significant role in shaping attitudes towards disability, with individuals with disabilities often being seen as having a special connection to the divine (Nasser 2017a, b). During the Islamic Golden Age, disability was often viewed as a punishment from God, reflecting the influence of Islamic philosophy on attitudes towards disability (El-Sayed 2018). In the modern era, social movements and advocacy efforts aimed at promoting the rights and inclusion of individuals with disabilities have played a significant role in changing attitudes towards disability in Egypt (Rizk 2009a).

### **Analysis of Policies and Initiatives Aimed at Supporting Individuals with Disabilities throughout History**

Throughout history, policies and initiatives aimed at supporting individuals with disabilities have varied in their scope and effectiveness. In ancient Egypt, for example, there were no formal policies or initiatives aimed specifically at supporting individuals with disabilities, but disabled individuals were often cared for by their families or religious institutions (Nasser 2017a, b). During the Islamic Golden Age, some charitable organizations were established to provide support for individuals with disabilities, but their reach was limited (Omran 2019). In the modern era, the Egyptian government has implemented various policies and initiatives aimed at promoting the rights and inclusion of individuals with disabilities, including the establishment of the National Council for Disability

Affairs (NCDA) and the passing of the Persons with Disabilities Law in 2018 (Gharib 2012).

Overall, the historical perspectives on disability in Egypt provide insights into the complex and evolving nature of attitudes towards disability in human societies. The comparison of attitudes and policies towards disability in different historical eras highlights the importance of addressing the underlying factors that shape these perspectives, including religion, philosophy, and social norms. The analysis of policies and initiatives aimed at supporting individuals with disabilities throughout history provides a foundation for identifying best practices and addressing existing gaps in the current policies and practices concerning individuals with disabilities in Egypt.

### **Implications for Contemporary Policies and Practices**

The historical perspectives on disability in Egypt have significant implications for contemporary policies and practices concerning individuals with disabilities. By examining the evolution of attitudes and policies towards disability throughout history, we can identify best practices and address existing gaps in the current policies and practices concerning individuals with disabilities in Egypt and other countries.

One of the key implications of this research is the importance of promoting inclusion and accessibility for individuals with disabilities. Throughout history, negative attitudes and discrimination have often been significant barriers for individuals with disabilities, preventing them from fully participating in society (Rizk 2009a, b). To address this, policies and initiatives aimed at promoting inclusion and accessibility are needed, such as the establishment of accessible infrastructure, employment opportunities, and educational resources (Gharib 2012).

Another implication of this research is the importance of addressing the underlying factors that shape attitudes towards disability, including religion, philosophy, and social norms. By promoting awareness and understanding of disability, engaging with religious and philosophical leaders, and challenging negative social norms, we can work towards creating a more inclusive and accepting society for individuals with disabilities.

### **Implications for Promoting Inclusion, Accessibility, and Human Rights for Disabled in Egypt and Other Countries**

The historical perspectives on disability in Egypt have implications for promoting inclusion, accessibility, and human rights for people with disabilities in Egypt and other countries. By learning from the successes and challenges of policies and initiatives aimed at supporting individuals with disabilities throughout history, we can identify best practices and develop strategies for promoting inclusion, accessibility, and human rights for people with disabilities.

For example, the establishment of the National Council for Disability Affairs in Egypt and the passing of the Persons with Disabilities Law in 2018 are important steps towards promoting the rights and inclusion of individuals with disabilities (Gharib 2012). However, there is still a need for greater implementation and enforcement of these policies, as well as for increased public awareness and understanding of disability.

In addition, the lessons learned from the historical perspectives on disability in Egypt can be applied to other countries, particularly those with similar cultural, religious, and social contexts. By sharing best practices and collaborating on initiatives aimed at promoting inclusion, accessibility, and human rights for people with disabilities, we can work towards creating a more inclusive and equitable world for all.

### **Recommendations for Future Research and Action**

Further research is needed to deepen our understanding of the historical perspectives on disability in Egypt and other countries. This could include research on the experiences of individuals with disabilities in different historical eras, as well as on the effectiveness of policies and initiatives aimed at supporting individuals with disabilities.

In addition, more action is needed to promote inclusion, accessibility, and human rights for people with disabilities. This could include advocacy efforts aimed at raising awareness and challenging negative attitudes towards disability, as well as the implementation of policies and initiatives aimed at promoting inclusion and accessibility.

Overall, the historical perspectives on disability in Egypt provide important insights into the complex and evolving nature of disability in human societies. By learning from the successes and challenges of policies and initiatives throughout history, we can work towards creating a more inclusive and equitable society for individuals with disabilities in Egypt and beyond.

Table 1 compares the analysis of disability in the four periods: Ancient Egypt, Ancient Greece and Rome, Islamic times in Egypt, and the 18th-19th centuries in Egypt.



**Table 1.** *Comparison of Analysis of Disability in the Four Periods*

<b>Period</b>	<b>Attitudes and Treatment of Disabilities</b>	<b>Support and Care for People with Disabilities</b>	<b>Challenges Faced by People with Disabilities</b>
<b>Ancient Egypt</b>	Generally positive and accepting attitudes. Disabilities are seen as divine attributes.	Integration into society. Opportunities for employment and contribution.	Limited information on specific laws or policies.
<b>Ancient Greece and Rome</b>	Varied attitudes. Physical disabilities are stigmatized. Intellectual disabilities cursed.	Exclusion from public life and education. Limited provisions for care and education.	Limited support and care. Exhibition of physical deformities.
<b>Islamic times in Egypt</b>	Emphasis on compassion and respect. Contributions to care and education	Islamic institutions providing support, education, and medical care.	Limited accessibility to education and employment
<b>18th -19th centuries</b>	Complex and evolving attitudes. Introduction of vocational training programs and institutions.	Emergence of charitable institutions and schools for people with disabilities.	Challenges in accessing education, employment, and public spaces.
<b>Contemporary Egypt</b>	Ongoing challenges in accessing education, employment, and public spaces.	Efforts by government and NGOs to address barriers. Rehabilitation centres and awareness campaigns.	Limited accessibility and stigma

### **Role Played by Religion, Philosophy, and Social Norms in Egypt**

Religion, philosophy, and social norms have played significant roles in shaping perceptions of disability in Egypt throughout history. In ancient Egypt, cultural and social acceptance of disability was expressed in their art and literature, where physical disabilities or body deformities were considered divine attributes granted to humans by the gods. According to M. A. Mikhail's article "Disability in Ancient Egypt," the ancient Egyptians believed that physical disabilities or body deformities were divine attributes granted to humans by the gods. This perspective reflected the influence of religion and its values on their attitudes towards disability.

During the Islamic era, disability was often viewed as a form of punishment for sins or a curse from God, according to Mikhail (2006). This negative view of

disability was reinforced by some religious texts, which contributed to the marginalization of individuals with disabilities in society.

In the modern era, with the rise of scientific and medical knowledge, the medical model of disability emerged. This model views disability as an individual problem that needs to be fixed or cured, according to Shakespeare (2012).

Social norms have also played a significant role in shaping attitudes towards disability in Egypt. During the colonial period, the British government introduced policies that reinforced negative attitudes towards disability and perpetuated the marginalization of individuals with disabilities, according to Borsay (2012). These policies included restricting access to education and employment for people with disabilities and establishing segregated institutions for their care. Throughout history, there have also been policies and initiatives aimed at supporting individuals with disabilities, such as philanthropic organizations, schools, and rehabilitation centres.

Overall, religion, philosophy, and social norms have played important roles in shaping perceptions of disability in Egypt throughout history. These references provide evidence to support the statement and offer additional information and context. By understanding these influences, we can gain insight into current attitudes towards disability and work towards creating a more inclusive and equitable society for all individuals, including those with disabilities.

## **Conclusion**

To sum up, this thorough examination of the many historical viewpoints on disability in Egypt provides insightful information that influences contemporary behaviors and policy. By acknowledging the impact of religion, philosophy, and societal conventions, we may endeavor to establish welcoming and easily accessible spaces that respect everyone's human rights. The study's conclusions highlight the value of adopting a multidisciplinary strategy that includes the examination of cultural objects, primary sources, and historical literature. We may create plans to encourage the social and economic inclusion of people with disabilities by comprehending the changes in attitudes regarding disability.

The study emphasizes how important knowledge and action are in establishing inclusive and accessible environments. The development of inclusive policies, the encouragement of social and economic inclusion, and the acknowledgement of the significance of human rights for people with disabilities should be the main areas of concentration. Seeking a more just and equitable society for all requires cooperation and coordinated effort.

We may resolve constraints and difficulties by increasing our understanding of the historical viewpoints on disability and their influence on contemporary policies and practices. This entails creating settings that are accessible and inclusive, encouraging social and economic inclusion, and emphasizing the value of human rights for people with disabilities. The historical background offers insightful information that may guide initiatives to advance accessibility, diversity, and human rights not only in Egypt but around the world.

To sum up, this research article has significantly advanced our knowledge of Egypt's historical attitudes toward handicaps. It has highlighted the value of inclusion and accessibility, shown the impact of religion, philosophy, and social norms, and stressed the necessity of laws and programs that assist people with disabilities. The knowledge gathered from this research motivates us to keep pursuing a society that protects the rights and welfare of every person, regardless of their disability.

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## A Hypothesis on the Original Meaning of Samson's Hair

By Felice Vinci\*

*The article presents the results of a study on the original meaning of Samson's hair, which according to the biblical text was the secret of his superhuman strength. In this narrative Delilah, after discovering that his power resides in his hair, cuts it, leaving him weakened and vulnerable, and then hands him over to the Philistines, who blind and imprison him. Drawing parallels between Delilah's characteristics and those of ancient lunar goddesses like the Caucasian Dali, Diana and Artemis, connections are made between Delilah and the Moon. Likewise, earlier research, delving into the significance of Samson's famous riddle, associates him with fire, metallurgical activities, and even the Sun itself (as indicated by the etymology of his name). This dual association—Delilah with the Moon and Samson with the Sun—is the key to understanding the original meaning of his hair, which is a sophisticated metaphor for the Sun's corona, which shines at the climax of a total solar eclipse, when Earth, Moon and Sun align. This event casts a cold darkness over the Earth, with the Sun appearing weakened and "blinded", resembling a black disk, surrounded by the corona, unable to provide light and warmth. Furthermore, additional hints, yet to be explored, suggest that other feats attributed to Samson may also symbolize celestial phenomena. It is also plausible that in ancient times the Sun's corona inspired the creation of regal diadems as well as radiate crowns—often adorned with seven rays, probably reminiscent of Samson's seven braids—symbolizing the ruler's identification with the Sun itself.*

**Keywords:** Samson, Delilah, Dali, Diana, Artemis, Sun, Moon, Sun's corona, solar eclipse, radiate crown

In this article we will try to demonstrate that at the origin of the story of Samson's hair, which was cut by Delilah and in which the secret of his strength was contained, there may have been a complex metaphor, inspired by a fascinating astronomical phenomenon that appears during solar eclipses: the Sun's corona.

This interpretation, influenced by the analysis of the Caucasian mythological figure Dali, whose attributes bear resemblance to both Delilah and the Moon-associated deities Artemis and Diana, alongside the etymological link between Samson's name and the Sun, was cultivated through a methodology characterized by a fresh critical scrutiny of not only biblical and classical sources but also diverse literary contexts.

The biblical episode featuring the story of Samson and Delilah is situated within the Book of Judges, where it forms part of a broader narrative surrounding the life and exploits of Samson:

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\*Senior Research Fellow, ATINER & Independent Researcher, Italy.

“Some time later, he fell in love with a woman in the Valley of Sorek whose name was Delilah. The rulers of the Philistines went to her and said, ‘See if you can lure him into showing you the secret of his great strength and how we can overpower him so we may tie him up and subdue him. Each one of us will give you eleven hundred shekels of silver’. So Delilah said to Samson, ‘Tell me the secret of your great strength and how you can be tied up and subdued’. Samson answered her, ‘If anyone ties me with seven fresh bowstrings that have not been dried, I’ll become as weak as any other man’. Then the rulers of the Philistines brought her seven fresh bowstrings that had not been dried, and she tied him with them. With men hidden in the room, she called to him, ‘Samson, the Philistines are upon you!’ But he snapped the bowstrings as easily as a piece of string snaps when it comes close to a flame. So the secret of his strength was not discovered. Then Delilah said to Samson, ‘You have made a fool of me; you lied to me. Come now, tell me how you can be tied’. He said, ‘If anyone ties me securely with new ropes that have never been used, I’ll become as weak as any other man’. So Delilah took new ropes and tied him with them. Then, with men hidden in the room, she called to him, ‘Samson, the Philistines are upon you!’ But he snapped the ropes off his arms as if they were threads. Delilah then said to Samson, ‘Until now, you have been making a fool of me and lying to me. Tell me how you can be tied’. He replied, ‘If you weave the seven braids of my head into the fabric [on the loom] and tighten it with the pin, I’ll become as weak as any other man’. So while he was sleeping, Delilah took the seven braids of his head, wove them into the fabric and tightened it with the pin. Again she called to him, ‘Samson, the Philistines are upon you!’ He awoke from his sleep and pulled up the pin and the loom, with the fabric. Then she said to him, ‘How can you say, ‘I love you’, when you won’t confide in me? This is the third time you have made a fool of me and haven’t told me the secret of your great strength’. With such nagging she prodded him day after day until he was tired to death. So he told her everything. ‘No razor has ever been used on my head’, he said, ‘because I have been a Nazirite set apart to God since birth. If my head were shaved, my strength would leave me, and I would become as weak as any other man’. When Delilah saw that he had told her everything, she sent word to the rulers of the Philistines, ‘Come back once more; he has told me everything’. So the rulers of the Philistines returned with the silver in their hands. Having put him to sleep on her lap, she called a man to shave off the seven braids of his hair, and so began to subdue him. And his strength left him. Then she called, ‘Samson, the Philistines are upon you!’ He awoke from his sleep and thought, ‘I’ll go out as before and shake myself free.’ But he did not know that the Lord had left him. Then the Philistines seized him, gouged out his eyes and took him down to Gaza. Binding him with bronze shackles, they set him to grinding in the prison. But the hair on his head began to grow again after it had been shaved. Now the rulers of the Philistines assembled to offer a great sacrifice to Dagon their god and to celebrate, saying, ‘Our god has delivered Samson, our enemy, into our hands’. When the people saw him, they praised their god, saying, ‘Our god has delivered our enemy into our hands, the one who laid waste our land and multiplied our slain’. While they were in high spirits, they shouted, ‘Bring out Samson to entertain us’. So they called Samson out of the prison, and he performed for them. When they stood him among the pillars, Samson said to the servant who held his hand, ‘Put me where I can feel the pillars that support the temple, so that I may lean against them’. Now the temple was crowded with men and women; all the rulers of the Philistines were there, and on the roof were about three thousand men and women watching Samson perform. Then Samson prayed to the Lord, ‘O Sovereign Lord, remember me. O God, please strengthen me just once more, and let me with one blow get revenge on the Philistines for my two eyes’. Then

Samson reached toward the two central pillars on which the temple stood. Bracing himself against them, his right hand on the one and his left hand on the other, Samson said, 'Let me die with the Philistines!' Then he pushed with all his might, and down came the temple on the rulers and all the people in it. Thus he killed many more when he died than while he lived"<sup>1</sup>.

From this passage, it becomes evident that Delilah possesses a highly seductive, ambitious, and determined nature, coupled with a lack of benevolence towards her lover. Conversely, Samson appears entirely captivated and dominated by her, going so far as to entrust her with the genuine secret of his strength, despite her prior attempts to betray him to the Philistines by exploiting the confidences—albeit misleading—he had shared with her under her persistent prodding.

In the Caucasian realm, particularly in Georgia, a character bearing significant similarities to Delilah can be identified. This character is found within the folklore and ancient traditions of Georgia, a culture that has preserved its heritage to an exceptional degree, possibly dating back over 3,000 years (Virsaladze 2017, p. 13). In the Svaneti region of Georgia, the Svan people continue to reside, and within their mythology, a prominent figure emerges: the hunting goddess Dali, also known as Daal or Dæl.

Dali, known as “the Lady of the wild animals” (Virsaladze 2017, p. 106), is depicted as a stunning woman adorned with long, braided, golden hair (Davidson, 2002, p. 15), and her complexion is described as luminous, so white that it almost emits light (Tuite 2006, p. 2), as evidenced by one of her epithets: “Radiant” (Rova 2016, p. 522). She is often portrayed unclothed (Tuite, 2006, p. 16), but if garments adorn her, they are consistently white attire (Berman et al. 2011, p. 105).

Dali's beauty was both mesmerizing and terrifying; it possessed the power to drive men to madness merely by conversing with her. Contrary to traditional gender norms, it was often Dali who selected the hunter and initiated the affair (Tuite 1997, p. 6). Indeed, in many tales, Dali is depicted as taking a hunter as her lover, a circumstance that could bring him benefits but also expose him to significant risks. Out of jealousy or other motivations, Dali was capable of causing harm to her chosen companion, and in extreme cases, even causing his demise (Chaudhri 2002, p. 170).

A crucial aspect of Dali's persona was her lengthy, golden-hued hair, which “shone like the sun” (Charachidzé 1993, p. 260). In some tales, she employs her exceptionally strong hair to bind hunters who have wronged her or even to strangle a hunter who had stolen one of her hairs to string his hunting bow (Davidson and Chaudhri 1993, p. 159).

Moreover, a recurring motif involves the utilization of Dali's hair as a means to threaten, harm, or even kill her. Many narratives depict hunters who seize her or sever her locks in attempts to subdue and assault her, with some variations suggesting that cutting her hair results in her demise (Chirikba 2015, p. 178). However, such actions fail to deter her from seeking retribution. In a tale featuring Dali's Mingrelian counterpart, Tkashi-Mapa, the goddess reluctantly agrees to wed

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<sup>1</sup>Jdg. 16:4-30.



a hunter after he menaces to shear her hair. Yet, ultimately, she retaliates by annihilating his entire lineage (Virsaladze 2017, p. 231).

Indeed, from these observations, Dali's resonance with the Greek goddess Artemis becomes evident (see Figure 1), whom Homer refers to as “πότνια θηρῶν Ἄρτεμις ἀγροτέρη”<sup>2</sup> (“the Lady of animals Artemis the huntress”). Furthermore, both the Iliad and the Odyssey emphatically highlight Artemis's beauty, her proficiency with the bow, and her lethal aspect.

**Figure 1.** Detail of a Fresco from Pompeii Depicting a Statue of Artemis with the Radiate Crown



Furthermore, the association of Dali's luminous and radiant appearance with the color white strongly indicates her connection to lunar symbolism, akin to both Artemis—who, as the twin sister of Apollo, the Sun god, embodies lunar attributes—and particularly her Roman counterpart, Diana. Diana's multifaceted nature as both a lunar and hunting deity aligns closely with Dali's typical attributes.

Surprising parallels also emerge between Dali and Dalila, such as their seductive but aggressive and even malevolent attitudes towards their lovers, as well as the significant emphasis placed on hair, even if in Dali's case it is hers, while the biblical story refers to Samson's hair—this is a significant discrepancy, which we will have the opportunity to return to later. It is also interesting to note that Delilah weaves Samson's braids on her loom<sup>3</sup>, as if to indicate the overlap of the two characters. Furthermore, as we have seen, Dali's extraordinary hair can be used to make bows, a not insignificant detail considering that the shape of the crescent Moon resembles a hunter's bow. Notably, the bow is mentioned twice in the Delilah episode and then no longer in the Book of Judges.

Considering the similarity between the names Dali and Delilah within the broader context of their shared characteristics, it seems reasonable to infer that this resemblance is not merely coincidental. When we juxtapose this with Dali's lunar

<sup>2</sup>Il. XXI, 470.

<sup>3</sup>Jdg. 16:13.



attributes, which align her closely with her classic counterpart Artemis-Diana—both associated with hunting and lunar symbolism—we can speculate that Delilah, with her enchanting beauty capable of ensnaring Samson entirely, may have originally possessed a lunar dimension that was later obscured over time.

This proposed association of Delilah with the Moon offers a coherent interpretation of her three unsuccessful attempts to get Samson to reveal the secret of his strength. They align neatly with the three primary phases of the lunar cycle: waxing moon, full moon, and waning moon. Additionally, the recurrence of the number seven, traditionally linked to the days of the lunar phases, in both the first and third attempts reinforces this perspective. Furthermore, the mention of the bow in Delilah's initial attempt, emblematic of the hunter goddesses due to its resemblance to the crescent Moon, further supports this lunar interpretation.

Moreover, the tripartite nature of the Moon as reflected in the biblical story of Delilah could also shed light on the original significance of the Latin adjective “triformis”, meaning “with three aspects”, attributed to Diana: “diva triformis”<sup>4</sup>, “conceived as a threefold unity of the divine huntress, the Moon goddess and the goddess of the nether world” (Alföldi 1960, p. 141). Diana Nemorensis, revered as such since the 6th century BCE, was worshipped as a triple goddess in her sacred grove on the shores of Lake Nemi, 20 km from Rome—a site that Virgil refers to as “Triviae lacus”<sup>5</sup>.

The worship of Diana at Nemi offers another intriguing connection. According to Servius<sup>6</sup>, this cult was established by Orestes, brother of Iphigenia, who fled to Italy with his sister after killing Thoas, the king of the Tauric Chersonese (Crimea), and brought along the image of the Tauric Diana (Frazer 1996, p. 3). Considering that Crimea is situated along the Black Sea coast, in close proximity to the Caucasus region associated with Dali, this geographical connection adds depth to the narrative. Furthermore, the significant role of Artemis in the dramatic events recounted by Euripides in the tragedies “Iphigenia in Aulis” and “Iphigenia in Tauris”<sup>7</sup> underscores the interconnectedness between Artemis, Iphigenia, and the Tauric Diana. These narratives seem to highlight a shared cultural and mythological heritage spanning different regions and civilizations.

Here, however, it is worth underlining that the events of Iphigenia told by Euripides, in particular her sacrifice in Aulis, are absolutely contradictory to what Homer says about her. In fact, according to the *Iliad*, Iphigenia lived peacefully with her family, including her brother Orestes and her sisters Chrysothemis and Laodice, during the Trojan War<sup>8</sup>. This indicates that the story of her sacrifice belongs to a tradition completely foreign to the Homeric world.

It is also noteworthy that during the Renaissance scholars drew comparisons between the sacrifice of Iphigenia and the biblical story of Jephthah, who offers

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<sup>4</sup>Ov., *Carm.* 3, 22, 4.

<sup>5</sup>Verg., *Aen.* VII, 516.

<sup>6</sup>Servius, on *Aen.* VI, 136.

<sup>7</sup>The eventful story of Iphigenia in Tauris—including her daring escape from the temple of Diana-Artemis together with Orestes and his friend Pylades (who were about to be sacrificed by her on the goddess' altar)—is also told by Ovid (*Ov.*, *Ex P.*, III, 2, 45-96).

<sup>8</sup>Il. IX, 142-145.

his daughter as a sacrifice to defeat the Ammonites<sup>9</sup>, to the point that “The first Renaissance biblical drama modeled on Greek tragedy: George Buchanan’s *Jephthes sive votum tragoedia* (...) transposes Euripides’ *Iphigenia in Aulis* into the story of Jephthah and his daughter” (Shuger 1998, p. 134-135). Furthermore, the story of Jephthah is recounted in the Book of Judges, where the chapters dedicated to Jephthah are precisely those that precede those featuring Samson. Thus it might be appropriate to conduct further investigations to ascertain whether these connections are mere coincidences or indicative of deeper intertextual and cultural influences.

Another significant convergence between the biblical narrative of Samson and the Caucasian myth of Dali further bolsters the coherence of the connections being drawn. This convergence involves Dali’s son, conceived when a hunter cut off her braids while she slept, raped her, and thus impregnated her (Berman et al. 2011, p. 84). However, the son who was born following the rape, named Amirani, emerges as a remarkable figure in Georgian epic tradition, bearing striking similarities to Prometheus from classical mythology (Charachidzé 1986).

Much like Prometheus, Amirani defies the gods by giving mankind the knowledge of metalworking. Consequently, he is punished and chained to the Caucasus Mountains, where an eagle devours his liver during the day, only for it to regenerate each night—a parallel to Prometheus’s torment in Greek mythology. Interestingly, Amirani’s connection to fire has left a lasting impact, extending beyond mythology. Astronomers have paid homage to him by naming an active extraterrestrial volcano on Io, one of Jupiter’s moons, after him (Smith 1979).

After noting that Prometheus, with his Caucasian dimension, is never mentioned in the Homeric poems—reflecting the earlier observation regarding the events of Iphigenia in Aulis and Tauris, recounted in the tragedies of Euripides but ignored by Homer—it’s worth highlighting the igneous-metallurgical dimension of Amirani. This aspect aligns perfectly with the fact that Svaneti, the homeland of the Svans who handed down to us the myth of Dali, has been exploited as a source of high-quality copper since the Bronze Age (Tuite 2006, p. 2). Moreover, it is noteworthy that Dali and Artemis, her Greek counterpart, are the mother of a character (Amirani) closely linked to fire and the twin sister of the sun god (Apollo) respectively. Considering the connections between each of them and the Roman Diana, in addition to their shared lunar dimension, a complex web of relationships emerges, of which another example is that of Tityos, the Homeric counterpart of Amirani and Prometheus since he shares their torment<sup>10</sup>. Furthermore, Tityos shares with Amirani the connection with a rape: Amirani is the result of the rape of Dali-Artemis, and Tityos attempts to rape Leto, Artemis’ mother.

Still on Dali’s son, his intimate connection with fire is a significant point of convergence with Samson. In a previous article (Vinci and Maiuri 2023), which we will briefly summarize here, we analyzed the biblical hero’s relationship with fire and metalworking, beginning with the circumstances surrounding his miraculous birth. Samson’s mother, previously barren, received news of his impending birth from an angel of the Lord, who subsequently ascended in the flame rising from an

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<sup>9</sup>Jdg. 11:30-40.

<sup>10</sup>Hom., *Od.* XI, 576-581.

altar after a sacrifice<sup>11</sup>. This association with fire intertwines with the metallurgical dimension that unlocks the meaning of Samson's famous riddle: "Out of the eater came something to eat, and out of the strong came something sweet"<sup>12</sup>, which refers to a swarm of bees and honey in the carcass of a roaring lion that he had killed in Timnah. This ancient riddle, contextualized against recent archaeological findings in the Timna Valley—a region home to ancient copper mines and metallurgical activities (Ben-Yosef 2018)—reveals a metaphorical link to the world of metalworking. The smelting furnace, akin to the "eater" in Samson's riddle, consumes minerals with fire, emitting a noise that recalls the roar of a lion and the buzz of bees swarming around a hive, then copper emerges, whose hue bears a resemblance to wild honey.

Furthermore, in that article we demonstrated that the solution to Samson's riddle finds parallels in myths and stories from various civilizations. For instance, we referenced the tale of the Nemean lion slain by Heracles and the Japanese myth in which Susanoo, brother of the sun goddess, defeats a dragon (as does Amirani) from whose tail he retrieves a sword considered one of the treasures of the Japanese imperial dynasty. Susanoo has been likened to "the Japanese Samson" (de Santillana and von Dechend 2003, p. 205). Additionally, we explored the legend of the sword in the stone from the myth of King Arthur (Vinci and Maiuri 2023a), decodable through a metallurgical metaphor, reflecting the ability of ancient blacksmiths to "extract" swords from iron ore. A compelling example is the sword stuck up to the hilt in a rock at the Montesiepi hermitage in the Metalliferous Hills of Tuscany. This legend is associated with San Galgano, a 12th-century knight after whom the adjacent Abbey is named. During the Middle Ages, this Abbey was a significant center for the production of weapons and tools crafted from iron obtained by smelting pyrite abundant in the region. These examples highlight the igneous-metallurgical dimension of Samson's character, directly connecting him to Dali's son, who, in turn, bears resemblance to the Greek Prometheus.

Perfectly consistent with this framework is the fact that in Samson's name, שמשן, which in Hebrew means "man of the sun" (van der Toorn et al. 1999, p. 404), the Hebrew word for the sun (שמש) is embedded. This even led in the past to the hypothesis that Samson's hair represented the rays of the sun (Mobley 2006, p. 7). Moreover, further confirmation of the intimate relationship between the solar and metallurgical dimensions can be found in the mythology of the Dogon people of Mali. According to their beliefs, the Sun was depicted as a large molten copper vessel (Griaule 1968, p. 25), which suggests the image of a small incandescent sun forming within the crucible at the culmination of the metal fusion process.

After delving into the relationship between the character of Samson with the Sun and fire, paralleled with that of Delilah with the Moon, it is time to draw conclusions. Based on our analysis, it becomes evident that behind the image of Samson being "weakened" by Delilah's cutting of his hair lies an extraordinary metaphor depicting the meeting of the Sun and the Moon during a total solar eclipse. During this event, the sky darkens, a cold darkness envelops the Earth, and the Sun appears as a "blinded" black disk, surrounded by the radiant Sun's corona

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<sup>11</sup>Jdg. 13:20

<sup>12</sup>Jdg. 14:14.

(Figure 2). The Sun's corona resembles bright hair, manifesting only at the climax of the eclipse—as if the Moon had detached it from the Sun's head, which at that moment seems to lose its light and its heat, just like Samson who lost his strength when he was shaved by Delilah.

**Figure 2.** *The Solar Corona Appears as a Glowing Head of Hair at the Height of Total Solar Eclipses*



From this powerful image an arcane feeling of enigmatic beauty and superhuman strength arises, which presumably inspired the metaphor of "Samson's hair", as well as Dali's hair, which, as we have noted, "shined like the sun". Furthermore, at this point the contradiction between the biblical story, which attributes the strength to Samson's hair, and the Caucasian myth, which instead attributes it to Dali's, is easily explained, considering that the uncertainty whether the corona belongs to the Sun or to the Moon lasted until the modern age! In fact, it was only in 1724 that the astronomer Giacomo Filippo Maraldi resolved the doubt, when he managed to demonstrate that the corona that appears during the total eclipse belongs to the Sun.

In summary, during the climax of a total eclipse the Sun appears to be "weakened" (as it ceases to emit light and heat) and "blinded", mirroring Samson's condition when he was captured and blinded by the Philistines after Delilah cut him hair. The term "eclipse" itself derives from the ancient Greek *ἔκλειψις*, which means "absence, abandonment". Interestingly, a similar association between blindness and fire appears in Roman mythology, particularly in the tale of Caeculus, the mythical founder of Praeneste and son of Vulcan. In fact, its name means "little blind man" and at the same time its story is closely linked to fire (Bremmer and Horsfall 1987).

Furthermore, another remarkable feat of Samson involves fire: "He went out and caught three hundred foxes and tied them tail to tail in pairs. He then fastened a torch to every pair of tails, lit the torches and let the foxes loose in the standing grain of the Philistines. He burned up the shocks and standing grain, together with the vineyards and olive groves"<sup>13</sup>. This strange tale finds a remarkable parallel in a peculiar Roman custom: "When the third day has dawned after the departure of

<sup>13</sup>Jdg. 15:4-5.

the Hyades, the Circus will keep the horses separated in their starting-stalls. So I must explain the reason why foxes are released bearing blazing torches on their backs”<sup>14</sup>. At first glance, making sense of these bizarre tales of fiery foxes seems impossible. But perhaps the key to the riddle can be found in Finnish folklore, where a mythical fox called *Tulikettu*, meaning “Fire Fox”, is known. This fox’s tail twinkles with fire, lending its name to the Northern Lights, known as *Revontulet*, or “Fox Fires”, in Finnish. According to legend, the Northern Lights are caused by the tail of the Fire Fox (Ojanen and Linnea 2019, p. 44), which throws sparks when it runs and touches the snowy ground, branches, or bushes (Figure 3).

**Figure 3.** *An Artistic Image of the Mythical Fire Fox*



In essence, the fiery foxes in Samson’s tale and the Roman Circus appear to be an extraordinary metaphor for the Northern Lights, one of the most fantastical celestial spectacles. Additionally, the elongated shape of fox tails, particularly those of red foxes, aptly represents the bright plumes of fire exhibited by the Northern Lights—or rather, the Nordic “Fox Fires”.

Interestingly, a passage from the *Iliad* might also allude to the Northern Lights: “As Zeus spreads a waving halo from out of heaven for mortals, as an omen of war or a chill winter”<sup>15</sup>. The adjective *porphyreos*, meaning “waving, floating”, is well-suited to describe the fluctuations of the Northern Lights. Additionally, the association of these lights with war is apparent in Agamemnon’s cuirass, which depicted “serpents of cyanus facing the neck, three on each side, similar to the “halos” (*irissin*) that the son of Cronus places in a cloud as an omen for mortals”<sup>16</sup>. These “snake-like halos” vividly express the impressive mobility of the Northern Lights<sup>17</sup>. Moreover, the term *iris* is also the name of Iris, the messenger of the gods in the *Iliad*. This suggests that ancient peoples may have interpreted the Northern

<sup>14</sup>Ov. *Fast.* IV, 679-682: “Tertia post Hyadas cum lux erit orta remotas/ carcere partitos Circus habebit equos,/ cur igitur missae vinctis ardentia taedis/ terga ferant volpes causa docenda mihi est”.

<sup>15</sup>ἥν τε πορφυρέην ἶριν θνητοῖσι τανύσση/ Ζεὺς ἐξ οὐρανόθεν τέρας ἔμμεναι ἢ πολέμοιο/ ἢ καὶ χειμῶνος δυσθαπέος (Hom. *Il.* XVII, 547-549).

<sup>16</sup>κούανει δὲ δράκοντες ὀρωρέχατο προτὶ δειρὴν/ τρεῖς ἐκάτερθ’ ἶρισσιν εὐικότες, ἅς τε Κρονίων/ ἐν νέφεϊ στήριξε, τέρας μερόπων ἀνθρώπων (Hom. *Il.* XI, 26-28).

<sup>17</sup>Instead, the usual interpretation of ἶρις as “rainbow” leaves us perplexed, since the rainbow, unlike the Northern Lights, is an absolutely static phenomenon.



Lights as omens, possibly viewing them as expressions of divine will, also considering that their glowing apparitions are always different from each other. One might even speculate on a connection between the “waving halo” in the Iliad and the biblical “sign of the covenant” that God placed on the clouds after the Flood<sup>18</sup>.

Returning to Samson, the relationship between his character and some impressive celestial phenomena such as the solar eclipse and the aurora borealis (which is not surprising if we consider that the Sun is in the root of his name) could reflect a *Weltanschauung* that is often found in the mythologies of the ancient world, which can be summarized with the famous phrase, attributed to Hermes Trismegistus, “what is below corresponds to what is above”. Here another example is given by the correspondence between the seven Pleiades and the Seven Hills of Rome (Vinci and Maiuri 2017), corroborated by the traditional date of the foundation of Rome, April 21st, which is also directly linked to the Pleiades because that day, the first of the zodiacal month of Taurus, according to the Mesopotamian calendar was dedicated to them (Vinci and Maiuri 2019). One should also consider that there are other ancient cities, such as Jerusalem, Byzantium, Mecca, Armagh, Tehran, Bamberg, Besançon, Moscow, even Macau in China, and so on, whose location on seven hills could be also linked to this idea (Nissan et al. 2019).

All of these elements could also provide a new interpretation of Samson's final exploit, wherein the Philistines, exploiting his weakness after Delilah's cutting of his hair, force him to turn a millstone<sup>19</sup>. However, he ultimately causes their temple to collapse on both his and their heads: “He pushed with all his might, and down came the temple on the rulers and all the people in it”<sup>20</sup>. In our view, considering the cosmic dimension of Samson's character, evident in the metaphor of his hair and the symbolism of the foxes, that millstone may symbolize the mythical “mill of the sky”. It represents the celestial vault with its perpetual rotation, visible during the night, which “is an image itself of time that incessantly grinds the eras, completing the measure assigned to them (...) The mill par excellence of the Nordic myth is *Grotti*, who grinds the prosperity and abundance of the god of fertility. After the progressive decadence of the eras the mill of the sky will be swallowed and will disappear into the depths of the celestial ocean, when the old cycle must be replaced by the new one” (Chiesa Isnardi 1996, p. 183). According to *Gróttasongr*, an Old Norse poem, the Grotti mill was operated by two giantesses who, being prisoners of an evil king, ultimately destroyed it through their superhuman strength until “the structure collapsed, and the sturdy stone split in two”<sup>21</sup>. This cataclysmic event, which marked the end of an era, seems to be comparable to Samson's final undertaking.

Interestingly, a millstone, comparable to both the Norse and the biblical one, is also mentioned by Homer. We are referring to the millstone in which the woman works who prophesies to Odysseus the defeat of the suitors<sup>22</sup>.

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<sup>18</sup>Gen. 9:12-16.

<sup>19</sup>Jdg. 16:21.

<sup>20</sup>Jdg. 16:30.

<sup>21</sup>*Gróttasongr*, 88-89.

<sup>22</sup>Hom. *Od.* XX, 105-121.

Returning now to Samson's hair, its identification with the solar corona on the one hand further reinforces the idea that Dalila's three failed attempts to steal the secret of his strength correspond to the waxing, full and waning phases of the Moon, on the other it aligns perfectly with the logic of her fourth, successful attempt, corresponding to the new moon phase, when the moon is invisible (being on the same side of the sun with respect to the Earth). In fact, a total solar eclipse, with the consequent appearance of the corona, can only occur in this phase.

It is also reasonable to assume that the myth of Samson's hair originated in a very ancient era. At the beginning it might have been inspired by the awe and fear evoked by total solar eclipses, which together with the Northern Lights are the most extraordinary celestial phenomenon. However, over the centuries, this myth has probably undergone progressive distortions and corruptions, obscuring its original features to the point of making them almost unrecognizable behind the metaphor in which it has remained hidden until now.

However, as often happens in these cases, when one comes across an unexpected solution, new questions arise from it. Remembering, for example, the fact that Ra, the Egyptian sun god, was considered both a king and the father of Pharaoh, and that in the iconography of ancient Egypt the solar crown, i.e., a disc framed by the horns of a ram or a cow, was worn by divinities such as Horus in his solar aspect, Hathor and Isis, as well as by the pharaohs themselves (Teissier 1996, p. 122), a question that immediately arises concerns the crown that has encircled the heads of kings since time immemorial: does it have its distant origin precisely from the Sun's corona? One might in fact suppose that the sacred aura that has always surrounded the figure of the king could have arisen from his identification with the Sun itself. But let's also think about the tips that characterize the traditional appearance of royal crowns and radiate crowns, as well as the feather headdresses of Native Americans (Figure 4).

**Figure 4.** *The Idea of Radiate Crowns, Headdresses and Regal Crowns Indicating the Wearer's Power Might Have Been Inspired by the Sun's Corona*



The radiate crown indeed holds significant symbolic value, representing the Sun and its radiance. It was prominently worn by Roman emperors in connection with the worship of Sol Invictus. Furthermore, depictions of the radiate crown with seven rays can be found in various ancient artifacts, such as the bust of Helios<sup>23</sup> from the 1st century AD and the statue of Artemis from Pompeii. Even in

<sup>23</sup>[https://en.m.wikipedia.org/wiki/File:Helios\\_with\\_chlamys\\_Louvre\\_AO7530.jpg](https://en.m.wikipedia.org/wiki/File:Helios_with_chlamys_Louvre_AO7530.jpg)

modern times, this symbolism persists, as evidenced by its presence in the Statue of Liberty<sup>24</sup> in New York.

The presence of seven rays in radiate crowns, including those seen in the artifacts mentioned earlier, could indeed reflect a vestige of a much older tradition, probably reminiscent of the “seven braids”<sup>25</sup> that Delilah severed from Samson when she sheared his hair.

In conclusion, without prejudice to the fact that this fascinating topic will require further in-depth analysis and investigation, there are good reasons to believe that the story of Samson's hair is actually a metaphor behind which hides the last memory of an ancient myth, inspired by the extraordinary spectacle of the Sun's corona in the culminating moment of a total solar eclipse. We arrived at this result after proving the identification of Delilah with the Moon and Samson with the Sun, and then verifying that his hair represents a surprising, bright (we can say so) metaphor of the Sun's corona. In fact, the corona appears at the moment in which the Sun, separated from its “hair” by the interposition of the Moon, finds itself weakened and “blinded”.

Even if with the passage of time this original meaning had been forgotten, on the one hand the permanence of the multiple links of the character of Samson with the sun and fire, and on the other the lunar dimension of Dalila-Dali, allowed us to reconstruct its original astronomical meaning. On the other hand, Samson's celestial dimension seems to be the key to deciphering the meaning of some of his other exploits, that of the foxes with their tails on fire and the final one, in which he sacrifices himself by causing the temple of the Philistines to collapse on his and their heads. However, these are topics, as well as that of the hypothesized origin of royal crowns and radiate crowns from the Sun's corona, which deserve further investigation.

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<sup>24</sup>The strong resemblance of the Statue of Liberty to the statue of Artemis portrayed in the Pompeii fresco (Figure 2) leads us to suspect that the its creator, Auguste Bartholdi, drew inspiration from it.

<sup>25</sup>Jdg. 16:19.



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