

## THE EFFECTS OF EDUCATIONAL STRUCTURE ON TEACHERS' WORKING CONDITIONS: EMPIRICAL EVIDENCE FROM GREECE

Maria Papadima<sup>1</sup>

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### *Abstract*

*The paper aims to examine the impact of educational structure on the working conditions of educators in Greece by utilizing qualitative time-series data over the period 1999-2021. Employing both bivariate tools and the Instrumental Variable Two-Stage Least Squares (IV-2SLS) technique, the study reveals diverse outcomes associated with teachers' job satisfaction, appraisal at work and attrition risks. Results indicate no direct impact of education spending on teachers' satisfaction rates, while, on the contrary, it becomes evident that the allocation of government funds to education, enrollment rates in primary and secondary schools, and the wider economic employment situation significantly affect teachers' appraisal value in regard to key education stakeholders. Enrolling more students in secondary schools significantly lowers the chance of teachers leaving their jobs, suggesting stability and possibly greater job satisfaction at this level. Lastly, higher enrollment in tertiary education increases attrition risk, possibly due to alternative opportunities available in the private sector.*

**Keywords:** Education; Working Conditions; Job Satisfaction; IV-2SLS Method; Education Spending; School Enrollment; Empirical Analysis

**JEL Codes:** A14, I21

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### **Introduction**

Education is the cornerstone of any society, serving not only as a means of transmitting knowledge but also as a vehicle for fostering innovation, critical thinking, and the social and economic development. It plays a pivotal role in shaping the future of nations, driving economic growth, and promoting social welfare. This essential function of education is globally recognized, yet the conditions under which educators operate vary significantly from one country to another, influenced by cultural, economic, and political factors. Gary Becker's (1964) groundbreaking research established the fundamental relationship between education and economic growth. He

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<sup>1</sup> PhD Student at the Faculty of Economics, South-West University "Neofit Rilski", Blagoevgrad, E-mail: [papadimam@piraeusbank.gr](mailto:papadimam@piraeusbank.gr), ORCID ID: 0000-0001-6132-4760

proposed that investing in education enhances human capital—including specialized knowledge, language proficiency, labor skills, and social goodwill—which consequently fosters innovation, technological advancement, and economic prosperity.

In Greece, a country with a rich historical legacy of schooling and learning, education continues to be a central pillar of society. The Greek education system, like many around the world, has undergone numerous reforms aimed at improving quality and accessibility. Despite these efforts, educators in Greece confront several issues daily, which include, but are not limited to, job satisfaction, the perception of being valued by education and societal stakeholders, and a low willingness to leave their jobs despite these challenges. These factors are crucial in understanding the broader context of education in Greece and the resilience and dedication of its educators.

Job satisfaction among educators is a complex qualitative variable, deeply intertwined with working conditions, salaries, professional development opportunities, and the educational environment in general. In Greece, teachers often have to navigate large class sizes, limited resources, and the pressure of high-stakes exams that dictate students' future educational opportunities. Despite these challenges, many educators exhibit a remarkable commitment to their profession, driven by a passion for teaching and a deep sense of responsibility towards their students' learning and well-being.

The perception of being valued by education stakeholders—ranging from parents and students to policymakers and the broader community—is another critical factor that influences educators' morale and effectiveness. In Greece, teachers often feel underappreciated and undervalued by society, despite the essential role they play in preparing our next generation. This lack of recognition can impact their motivation and satisfaction, yet many continue to strive for excellence often going above and beyond their official duties.

The structure of this paper is as follows: The first part will provide an overview of the existing literature, while the second part will offer a comprehensive analysis of the research methodology applied. Subsequently, part three will delve into the findings of the study. Finally, part four will conclude the paper by summarizing the results and offering useful recommendations for future reference. This study attempts to contribute to the ongoing international conversation on how education shapes educators' behavior, ultimately fostering broader societal and economic benefits.

## **1. Literature review**

Existing literature regarding the effects of education system on teachers' working conditions encompasses a broad spectrum of studies, from global analyses to more localized inquiries in the context of Greece. According to Yuleva-Chuchulayna in the modern conditions, learning and teaching are open to innovation and new ideas. Especially after the sharp digitization of the educational process due to the pandemic situation related to Covid-19 (Yuleva-Chuchulayna, 2022). Globally, the research

highlights a multifaceted picture of how educational policies, teacher preparation, and professional development directly influence teachers' working conditions and, consequently, their job satisfaction, retention, and effectiveness in the classroom. For instance, several scholars suggest that investment in education directly contributes to economic expansion, though some debate this connection as uncertain or potentially adverse. According to Ivanov (2021) motivation is a highly complexed process within the work place. A study by Hanushek and Wößmann (2012) revealed a beneficial link between spending on education and economic growth among various nations.

A study of Johnson, Kraft & Papay (2012) found that the working conditions of teachers significantly impact their job satisfaction and retention. Thus, in the context of public education, in order to ensure that all students have access to quality teaching, it is imperative that schools are environments that foster and support effective teaching and learning in every classroom. Michaelowa (2002) discusses the link between teacher job satisfaction and student's achievement, suggesting that improved working conditions for teachers can lead to better educational outcomes. Moreover, a study by McWherter (2012) from Gardner-Webb University explores how teachersatisfaction impacts student's achievement, highlighting the importance of addressing teachers' needs for the benefit of students. Interestingly, in another research study conducted by Toropova, Myrberg & Johansson (2019) regarding the attributes of educators, it was observed that women teachers, those who had more opportunities for professional development, and teachers with a greater sense of efficacy often reported higher job satisfaction levels. Furthermore, the study revealed that the correlation between teachers' collaboration and job satisfaction was stronger among male teachers. Conversely, effective student discipline played a more significant role in the job satisfaction of teachers who held lower beliefs in their own efficacy. The policy implications of these findings are also explored further. Moreover, Filipova and Yuleva-Chuchulayna write that in the process of digitization and the change of education to almost digital, the professional training of teachers in higher schools is of particular relevance, conditioned by social and pedagogical importance. This includes a set of a number of individual competencies that teachers need to possess and develop (Filipova & Yuleva-Chuchulayna, 2021).

In the case of Greece, existing literature also attempts to assess to what extend external education factors interact with teachers' working conditions. A survey conducted by Anastasiou & Papakonstantinou (2014) reveals that teachers expressed greater satisfaction with the intrinsic aspects of their job, such as the essence of the work and the opportunity to assist and interact with their students, but showed less contentment with their working conditions. Additionally, it was noted that younger teachers and female teachers experienced higher stress levels. Meanwhile, Polychroni, Kotroni & Antoniou (2009) suggest that there are five main stress factors among school teachers associated with working conditions, heavy workload and organizational changes that occur very frequently. A study by Kakana, Roussi,

Garagouni & Mavidou (2017) found that educators adopted several coping strategies during the economic crisis, such as reducing student stationery and materials, implementing programs for emotional support, collaborating with local organizations like municipalities, churches, and social groceries, and enhancing communication with parents' associations. A paper by Lykopoulou (2020) explores how university culture in Greece affects academic beliefs and performance, focusing on three levels: the enterprise, the profession, and the cognate area. A questionnaire survey of 471 teachers across Greece revealed that higher innovation in educational services correlates with higher innovation in educational processes. A study by Agiannidou and Bozhkova (2021) observes the stress level of teachers that are involved in the intercultural educational process in Greece. Last but not least, another recent study by Anastasiou & Belios (2020) sheds light on the emotional exhaustion of primary school teachers due to aging. Teachers experienced lower satisfaction and higher stress due to external aspects of their job, including working conditions and hours. Female teachers tended to derive more satisfaction from the internal aspects of their job, while male teachers were more prone to feelings of emotional burnout and a diminished sense of personal achievement.

## **2. Research Methodology**

In order to investigate the influence of the Greek educational system's structure on teachers' working conditions, it is essential first to clarify what constitutes the educational structure. Key components such as financial funding for education, student attendance rates, the overall number of active teachers, and teachers' salaries form the basis of the educational structure and will be considered as independent variables in this analysis.

The assessment of satisfaction metrics and the development of an associated dataset necessitate a quantification process due to their reliance on qualitative factors. Hence, the OECD's Teaching and Learning International Survey (TALIS) offers a way to transform this relevant information into quantifiable data, enabling the creation of so-called score datasets suitable for both linear and non-linear regression analyses. The data from TALIS are derived solely from the self-reports of teachers and school principals, reflecting their personal views, perceptions, beliefs, and self-described activities. We focus on three key variables: teacher's satisfaction score (the proportion of teachers who are overall satisfied with their job), attrition risk (the proportion of teachers considering leaving or changing schools), and teacher's appraisal (the proportion of teachers who feel their work is valued by their principal and the society).

The present research study utilizes the Instrumental Variable Two-Stage Least Squares (IV-2SLS) method. This approach is a statistical tool applied in research and econometrics for tackling problems of endogeneity, especially in situations where a causal link is hypothesized but direct observation is complicated by the presence of unseen (exogenous) variables. Therefore, in the present analysis, the endogenous variables consist of the ratio of education spending to GDP and the overall government

spending, in addition to the gross enrollment rates across all education levels (primary, secondary, and tertiary). On the flip side, exogenous variables include the percentage of wage and salaried workers in the total workforce, the proportion of industrial employment in total employment, and the unemployment rate among those with higher education as a fraction of the total labor force with equivalent advanced education. The timeframe under consideration extends from 1999 to 2021, covering the necessary data to investigate trends, relationships, and causal effects before, throughout, and following the onset of the Greek debt crisis in 2010.

Assuming limited heteroskedasticity and non-fixed yearly effects the model equations are defined as follows:

$$SCORE_{y,t} = \alpha + \gamma_1 * EXP_t + \gamma_2 * GOV_t + \sum \rho_i * SET_{i,t} + \sum \psi_i * X_{j,t} + u + z$$

where:

*SCORE<sub>i,t</sub>*: A vector of endogenous dependent variables y consisting of the following variables of interest for each year t: teacher satisfaction (TS), attrition risk (AR), teacher appraisal (TA).

*EXP<sub>t</sub>*: The total expenditure on education is as a ratio GDP in year t

*GOV<sub>t</sub>*: Expenditure on education as a percentage of total government expenses in year t

$\sum SET_{i,t}$ : A vector of endogenous explanatory variables i for year t consisting of school enrollment gross ratios for all educational stages

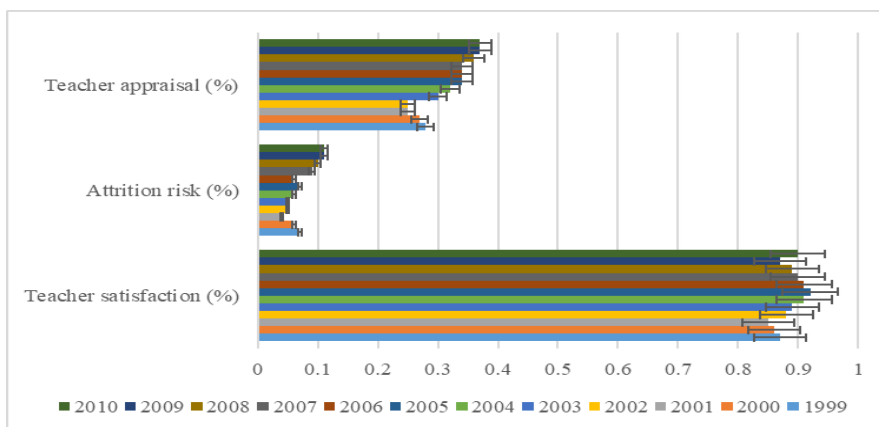
$\sum X_{j,t}$  : A vector of exogenous explanatory variables j consisting of the following independent variables for each year t: waged and salaried workers (% total employment) denoted as WAGE, employment in industry (% total employment) denoted as EMP and lastly unemployment with advanced training (% of total labor force with advanced training) denoted as UEMP.

*u, z* : Error terms

### 3. Analysis

Before delving into the core analysis of the research, it's crucial to offer some perspective on teachers' job satisfaction levels, appraisal scores, and the risk of attrition in the context of the Greek debt crisis in 2010. This is significant because the education sector was profoundly affected by this financial turmoil, permanently altering the economic outlook of the educational framework in Greece. Figures 1 and 2 show educators' perspective prior and after the outbreak of the crisis. Notably, teachers' average satisfaction scores rose in the post-crisis period, from 0.88 to 0.94. Simultaneously, the risk of attrition (which has a detrimental impact) nearly doubled from one timeframe to the next (from 0.07 to 0.16), indicating that the likelihood of educators resigning from their jobs or moving to different schools increased by 9% after the economic crisis compared to the same timeframe prior to the Greek financial turmoil.

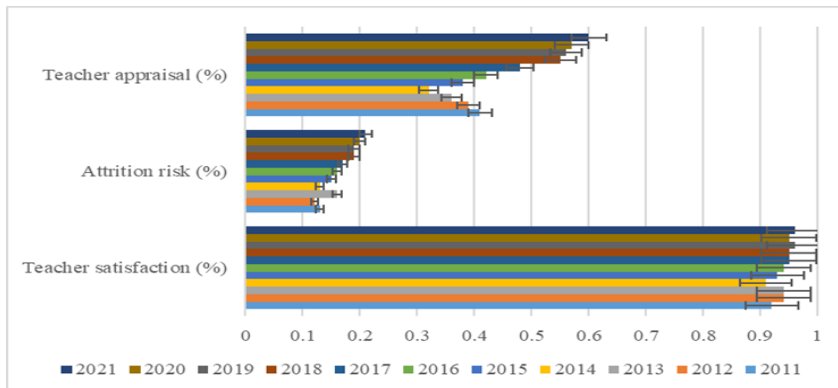
Figure 1. Quantification of teacher's working conditions ex-ante the crisis



Source: OECD (TALIS Survey)

Concerning the rate at which teachers feel valued, it is noted that, on average, 45% of teachers feel recognized and valuable to their principals and society at large. This percentage is 14% higher than what was observed for the same period before the economic crisis. Overall, the evidence indicates that working conditions have somewhat improved over the past decade. However, it is troubling that there has also been an increase in teachers' desire to leave their positions.

Figure 2. Quantification of teacher's working conditions ex-post the crisis



Source: OECD (TALIS Survey)

In the initial stage of the model, it's essential to tackle the potential endogeneity issue of the endogenous variables. Thus, we perform a regression of each endogenous variable (EXP, GOV, and SETs) against all exogenous variables and the instrumental variables (WAGE, EMP, and UEMP). During the model's second phase, we conduct a regression of the dependent variables (SCORE) on the predicted values obtained from the first stage (serving as substitutes for the endogenous variables), together with any remaining exogenous variables.

As a result, table 1 presents the empirical outcomes focusing on teachers' satisfaction scores. Regarding education expenditure, the findings show no statistical

significance, suggesting that the allocation of education spending as a percentage of GDP or government budgets does not correlate with a notable shift in job satisfaction among teachers. Same applies for secondary and tertiary attendance levels. On the contrary, satisfaction slightly increases the greater the primary school participation, yielding however, statistical significance at the 10% level. Regarding the exogenous variables, the EMP coefficient shows a value of -0.50, which is statistically significant at the 5% level. The negative value of this coefficient suggests that a rise in the share of industrial employment compared to total employment correlates with a decline in teachers' job satisfaction. This could be due to a resource or focus competition between the industrial sectors and the educational sector. Intriguingly, the WAGE result indicates that higher ratios of waged and salaried workers correlate with improved job satisfaction among teachers. This might reflect broader economic conditions, where job stability and quality outside the teaching profession could make teaching roles more appealing

*Table no. 1. Stage 2 coefficients with Job Satisfaction as dependent variable*

<b>Model</b>	<b>IV-2SLS</b>	
<b>Independent Variables</b>	<b>Dependent Variable: Job Satisfaction</b>	
	<b>Coefficients</b>	<b>Standard Errors</b>
GOV	- 0.03	0.05
EXP	0.05	0.06
SET1	0.01***	0.009
SET2	0.002	0.009
SET3	0.001	0.001
EMP	- 0.50**	0.21
WAGE	0.51*	0.18
UEMP	- 0.01	0.12
Observations	23	
Multiple R	0.87	
R-Square	0.76	

*Source:* Author's calculations with IBM SPSS

*Note* \*, \*\* and \*\*\* implies that the value is significant at the 1%, 5% and 10% levels

Table 2 displays the empirical outcomes directly related to teachers' appraisal scores. The findings indicate that the government's emphasis on education funding, enrollments in primary and secondary schools, and the general economic employment situation significantly affect teachers' feelings of acknowledgment and value by important stakeholders (such as principals, colleagues, students, and society at large). Regarding the relationship with WAGE, an increased ratio of waged and salaried employees in the overall labor market is linked positively to higher teachers' appraisal scores. This might reflect the broader economic conditions, suggesting that the quality of employment across the board can influence how teaching is viewed by society. This observation aligns with the coefficient result observed when job

satisfaction was the variable under consideration, hinting at a general trend towards the influence of the economy's average wage levels.

*Table 2. Stage 2 coefficients with Appraisal Score as dependent variable*

<b>Model</b>	<b>IV-2SLS</b>	
Independent Variables	Dependent Variable: <b>Appraisal Score</b>	
	<b>Coefficients</b>	<b>Standard Errors</b>
GOV	0.27**	0.13
EXP	- 0.28***	0.14
SET1	0.12*	0.02
SET2	0.01***	0.006
SET3	0.005**	0.002
EMP	- 0.78*	0.51
WAGE	0.45*	0.45
UEMP	0.44*	0.30
Observations	23	
Multiple R	0.92	
R-Square	0.85	

*Note* \*, \*\* and \*\*\* implies that the value is significant at the 1%, 5% and 10% levels

*Source:* Author's calculations with IBM SPSS

Last but certainly not least, Table 3 provides the empirical findings focusing on the risk of teacher attrition. It presents the highest multiple R value found in the study (94%), indicating that the independent variables accounted for a significant portion (89%) of the variation in teachers' risk of leaving their jobs. This high correlation suggests that the model is well-suited to the data, demonstrating that the selected variables are effectively relevant in explaining the risk of attrition.

*Table 3. Stage 2 coefficients with Job Satisfaction as dependent variables*

<b>Model</b>	<b>IV-2SLS</b>	
Independent Variables	Dependent Variable: <b>Attrition risk</b>	
	<b>Coefficients</b>	<b>Standard Errors</b>
GOV	-0.14	0.20
EXP	0.16	0.22
SET1	0.02	0.03
SET2	- 0.004***	0.003
SET3	0.003**	0.001
EMP	- 0.74*	0.22
WAGE	0.29*	0.20
UEMP	-0.03	0.13
Observations	23	
Multiple R	0.94	
R-Square	0.89	

*Source:* Author's calculations with IBM SPSS

*Note* \*, \*\* and \*\*\* implies that the value is significant at the 1%, 5% and 10% levels

The findings underscore the significance of boosting secondary school attendance as a strategy to diminish the risk of teachers leaving their jobs. Conversely,



an increase in tertiary education enrollment rates is linked with a higher risk of attrition, possibly due to the challenges or expectations associated with higher-level teaching or the allure of opportunities outside the teaching field. The influence of industrial wages on attrition risk is also notable. With a coefficient of 0.29, which is positive and statistically significant at the 1% level, the data suggests that a higher ratio of waged and salaried workers in the economy increases the likelihood of teachers considering leaving, possibly due to competition for skilled individuals in the broader labor market. Nonetheless, the non-significant results for government spending (GOV) and education expenditure (EXP) imply that the amount of money spent may not be as crucial as the manner in which it is utilized. Finally, the model hints at the idea that as employment in the industrial sector grows, possibly indicating a stronger economy, there may be a reduced tendency among teachers to exit their profession.

#### **4. Conclusions and Recommendations**

This paper examines the effects of Greece's educational structure on teachers' working conditions using qualitative time series data over the period 1999-2021. The time frame itself is characterized by diverse challenges, including the 2010 financial crisis (the subsequent austerity measures that hit education sector) and the 2020 coronavirus pandemic (classes conducted via internet). Despite these difficulties, the study effectively revealed several impacts that education funding, school enrollment and a series of exogenous variables have on how educators perceive their working conditions.

Based on the empirical findings, the dynamics of the Greek labor market significantly influence teacher satisfaction, with an increase in industrial employment negatively impacting it, suggesting a shift in emphasis or resources away from the education sector. Furthermore, the structure of wages in the wider economy, as indicated by the ratio of waged and salaried workers, is associated with teachers' perceptions of value and acknowledgment by their community. This association is evident in both teacher satisfaction and appraisal scores, suggesting that broader economic conditions may affect how teachers perceive their societal value.

The increase in secondary school attendance notably diminishes the risk of teacher attrition, underscoring the stability and possibly greater satisfaction linked to teaching at this level. On the contrary, higher rates of tertiary education attendance heighten this risk, potentially due to the increased pressures or alternative opportunities available in the private education sector. This research lays the groundwork for further academic exploration in this field, aiming to develop a detailed understanding of how public expenditure on education and school/university participation correlate with teachers' working conditions. Policy makers in Greece could also find the empirical findings of this study particularly valuable, as education stands as a crucial pillar for promoting societal and economic growth.

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