DISCUSSION PAPERS

No 164

Income Shocks, Working Hours, and Mental Health During COVID-19.

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February 2026

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Income Shocks, Working Hours, and Mental Health During COVID-19.

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February 25, 2026

Abstract

This paper examines mental health patterns in Greece during the COVID-19 pandemic, focusing on labor-market disruptions, primarily income losses and changes in working hours. Using longitudinal EU-SILC data (2019–2024) and first-difference models with individual fixed effects, we estimate the within-person impact of economic shocks on self-reported mental health. Our findings indicate that income losses were significantly associated with an increased likelihood of mental health deterioration, while increases in working hours demonstrated a modest protective association. These associations exhibited strong heterogeneity across groups. Income shocks were more strongly linked to mental health changes for men, while adjustments in working hours showed a greater link for women. Mid- to late-career workers experienced the most pronounced mental health deterioration in association with income losses, possibly reflecting greater financial and family obligations, whereas younger adults also showed notable associations, consistent with greater economic uncertainty. Occupational characteristics further influenced these patterns: increased hours were a protective factor for private-sector workers and employees, while reduced hours were associated with improved mental health among the self-employed, suggesting workload flexibility may alleviate stress. Despite job-retention policies limiting layoffs, labor market adjustments in Greece primarily involved income reductions and changes in working hours, which were associated with substantial psychological burdens. These findings underscore the importance of income-stabilization measures and integrated labor market mental health support during economic crises.

JEL codes: I12, J21, J22
Keywords: COVID-19, mental health, income loss, working hours, labor market, Greece

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Εισοδηματικά σοκ, ώρες εργασίας και ψυχική υγεία κατά τη διάρκεια της πανδημίας COVID-19.

Περίληψη

Η παρούσα μελέτη διερευνά τις τάσεις της ψυχικής υγείας στην Ελλάδα κατά τη διάρκεια της πανδημίας COVID-19, εστιάζοντας στις επιπτώσεις των διαταραχών της αγοράς εργασίας, ειδικότερα στις απώλειες εισοδήματος και τις μεταβολές στις ώρες απασχόλησης. Χρησιμοποιώντας διαχρονικά δεδομένα EU-SILC για την περίοδο 2019–2024 και εφαρμόζοντας μοντέλα πρώτων διαφορών, εκτιμούμε τον αντίκτυπο των οικονομικών κραδασμών στην αυτοαναφερόμενη ψυχική υγεία. Τα ευρήματα καταδεικνύουν ότι οι μειώσεις εισοδήματος συσχετίζονται με αυξημένη πιθανότητα επιδείνωσης της ψυχικής υγείας, ενώ οι αυξήσεις στις ώρες εργασίας λειτουργούν προστατευτικά. Παρατηρείται σημαντική ετερογένεια αυτών των επιδράσεων μεταξύ κοινωνικοδημογραφικών ομάδων. Συγκεκριμένα, η μείωση των εισοδημάτων φαίνεται να επηρεάζει εντονότερα την ψυχική υγεία των ανδρών, ενώ οι μεταβολές στις ώρες εργασίας έχουν ισχυρότερη συσχέτιση με την ψυχική υγεία των γυναικών. Οι εργαζόμενοι σε προχωρημένη φάση της επαγγελματικής τους σταδιοδρομίας καταγράφουν τη μεγαλύτερη επιδείνωση της ψυχικής υγείας λόγω απωλειών εισοδήματος, πιθανόν εξαιτίας αυξημένων οικονομικών και οικογενειακών υποχρεώσεων. Ταυτόχρονα, οι νεότεροι ενήλικες παρουσιάζουν επίσης αξιοσημείωτες συσχετίσεις, εύρημα που είναι συνεπές με υψηλότερα επίπεδα οικονομικής επισφάλειας. Τα επαγγελματικά χαρακτηριστικά διαφοροποιούν περαιτέρω τα παρατηρούμενα πρότυπα: οι αυξημένες ώρες εργασίας λειτουργούν προστατευτικά για τους εργαζόμενους στον ιδιωτικό τομέα και τους μισθωτούς, ενώ οι μειωμένες ώρες συνδέονται με βελτίωση της ψυχικής υγείας μεταξύ των αυτοαπασχολούμενων, υποδεικνύοντας ότι η ευελιξία στον φόρτο εργασίας μπορεί να μετριάσει το άγχος. Παρόλο που οι πολιτικές διατήρησης της απασχόλησης συνέβαλαν στον περιορισμό των απολύσεων, οι προσαρμογές της αγοράς εργασίας στην Ελλάδα εκδηλώθηκαν κυρίως μέσω μειώσεων εισοδήματος και μεταβολών στις ώρες εργασίας. Αυτές οι προσαρμογές συσχετίστηκαν με σημαντικές ψυχολογικές επιβαρύνσεις. Συνολικά, τα ευρήματα υπογραμμίζουν τη σημασία αποτελεσματικών μηχανισμών σταθεροποίησης του εισοδήματος και ολοκληρωμένων παρεμβάσεων ψυχολογικής υποστήριξης κατά τη διάρκεια οικονομικών κρίσεων.

Λέξεις Κλειδιά: COVID-19, ψυχική υγεία, απώλεια εισοδήματος, ώρες εργασίας, αγορά εργασίας, Ελλάδα

1   Introduction

The COVID-19 pandemic has been one of the most severe crises in modern history, simultaneously threatening public health and destabilizing economic and social life worldwide. As of January 2023, more than 6.7 million people had lost their lives due to the SARS-CoV-2 virus (Johns Hopkins Coronavirus Resource Center). The restriction measures that were implemented to contain its spread, although necessary to slow contagion, had far-reaching effects on employment, work intensity and income security and affected household financial situation and everyday routines (Gupta et al., 2020; Botha et al., 2020; Baird et al., 2022). Labor market developments included involuntary disruptive life events such as the shutdown of businesses, workers being removed from their jobs, the halt in hiring activities and the reduction in total hours worked. In point of fact, global working hours fell by 8.8% in 2020 compared with the fourth quarter of 2019, equivalent to around 255 million full-time jobs (ILO, 2020).

In general, large-scale labour market shocks are likely to affect individual health and well-being. A broad literature shows that involuntary job loss and income decline is associated with worsening general health (Brand, 2015), and increased mental health problems and depression (Frasquilho et al., 2015) operating through the hardship of financial stress and lowered self-esteem (Schaller and Stevens, 2015; Gebel and Voßemer, 2014). However, COVID-19 represents a different type of shock compared to previous financial crises. The pandemic began as a public health emergency with non-economic origins but generated profound economic repercussions through mandatory lockdowns and mobility restrictions. Its nature as a health crisis created complex trade-offs between workplace exposure to the virus and the risks associated with job loss. For health and frontline workers, for instance, job separation could reduce virus exposure and thereby ease some mental health risks, though it still entailed significant financial costs. Unlike traditional crises, COVID-19 combined a direct health emergency with deep economic and social disruptions, shaping an environment where mental health was affected through multiple channels, including financial strain, pervasive uncertainty, social isolation, and pressures in balancing work and family life.

State interventions played a critical role. Following the outbreak of the pandemic, governments introduced fiscal measures to protect firms and employees, primarily through direct transfers, enhanced unemployment benefits, and job-retention schemes. In some cases, replacement rates were so generous that benefits temporarily exceeded pre-pandemic earnings, cushioning income losses and mitigating the mental health effects of sudden job disruption (Ganong, Noel and Vavra, 2020). Indeed, Ganong, Noel and Vavra (2020) found that almost two-thirds of unemployed workers eligible for benefits received more than their lost earnings, with a median replacement rate of 134 percent. Policy responses, however, varied across countries. In the United States, unemployment spiked due to the reliance on unemployment

insurance as the main support mechanism (Gros and Ounnas, 2021), whereas in Europe unemployment rose only modestly, despite sharp declines in working hours (Anderton et al., 2021).

Recent evidence documents sharp increases in depressive symptoms and psychological distress during the pandemic, with women, younger workers, part-time employees, and those in precarious jobs disproportionately affected (Adams-Prassl et al., 2020; Etheridge and Spantig, 2022; Foremny, Sorribas-Navarro and Castelló, 2024). However, relatively little is known about how institutional labour-market responses have shaped these outcomes. Understanding the intersection between labour-market shocks and mental health is crucial, as such insights can guide more targeted policy interventions aimed at mitigating long-term psychological and socio-economic costs.

This paper addresses this gap by examining the impact of COVID-19-related labour-market shocks on mental health in Greece, a country marked by pre-pandemic vulnerabilities and limited social protection. Using longitudinal microdata from the Greek Statistics on Income and Living Conditions Survey (EU-SILC), we analyze within-person changes in self-reported mental health outcomes attributable to COVID-19. We contribute by focusing on "stayers", that is, workers who remain in the same occupation (ISCO), which allows us to isolate the effects of income losses and changes in working hours from broader job displacement dynamics. We also contribute by employing a first-differences empirical design that accounts for unobserved individual heterogeneity and examines heterogeneous effects across different groups.

Our findings show that income loss is the main driver of deteriorating mental health, while changes in working hours also matter for specific groups. The effects are heterogeneous: income shocks weigh more heavily on men and mid- to late-career workers, whereas working-hours adjustments affect women more strongly. Occupational characteristics further shape responses, with increased hours protective for private-sector workers and employees, and reduced hours improving mental health among the self-employed, suggesting workload flexibility may alleviate stress. These results highlight that even when job-protection policies prevent layoffs, the psychological costs of income volatility and shifts in working time remain substantial. The rest of the paper proceeds as follows: Section 2 reviews the literature; Section 3 discusses the Greek context; Section 4 presents the data; Section 5 outlines the empirical strategy; Section 6 reports results; and Section 7 concludes.

2 Literature Review

The relationship between economic fluctuations and population health has long been a subject of study. Classical research has focused primarily on the link between business cycles, often proxied by the unemployment rate, and various health outcomes. Early contributions, such as Ruhm (2003), Ruhm (2000),

and Gebel and Voßemer (2014), document that recessions may paradoxically improve certain physical health outcomes, notably mortality, possibly through reductions in traffic accidents, and risky behaviours. However, these beneficial effects on physical health stand in contrast to a more consistent finding: recessions tend to deteriorate mental health. Bradford and Lastrapes (2014) emphasize that economic downturns heighten insecurity, financial strain, and psychosocial stress, contributing to higher rates of depression, anxiety, and other mental disorders. This divergence between physical and mental health responses to cyclical downturns and the mechanisms underlying these heterogeneous effects have attracted considerable attention (Margerison-Zilko et al., 2016).

One illustrative case is provided by Avdic, de New and Kamhöfer (2021), who, using German data, show that the Great Recession's adverse effects on mental health persisted long after macroeconomic recovery. Their findings suggest that fear of job loss and income uncertainty were detrimental, highlighting the psychological burden of economic volatility. Recent meta-analyses further confirm the robustness of the recession–mental health link and emphasize the moderating role of institutional contexts such as welfare regimes and social protection systems (Talamonti et al., 2024). In a comprehensive review, Talamonti et al. (2024) argue that financial crises and mental health problems may reinforce one another, as economic distress induces psychological disorders, which in turn hinder productivity and recovery. More recent work has turned to the role of economic uncertainty as a distinct stressor. Di Quirico (2023) examines the psychological effects of prolonged uncertainty in the post-pandemic period and argues that it can independently amplify anxiety and depression beyond the impact of realized income or job losses. This growing body of evidence underscores that the relationship between economic shocks and mental health is mediated through expectations, stress pathways, and coping mechanisms, highlighting the central role of institutional support in shaping resilience.

While recessions have long been studied in relation to health outcomes, the COVID-19 pandemic represents a fundamentally different type of crisis. It simultaneously triggered a public health emergency, widespread mobility restrictions, and an economic collapse, combining health, behavioural, and economic disruptions in an unprecedented way. This makes the pandemic a compelling case for analysing the multifaceted impact of economic shocks on mental health. Early evidence documented alarming increases in psychological distress across populations. Xiong et al. (2020) report that anxiety and depression symptoms reached 16 - 28% in several countries, while Rajkumar (2020) note widespread distress even among individuals not directly affected by infection. Asper et al. (2022) provide a comparative perspective, showing that mental health systems were largely unprepared for this surge in demand. Recent longitudinal studies indicate that these effects were not temporary. Using survey data, Essadek et al. (2025) find that disadvantaged young adults experienced persistent increases in depression and anxiety.

Further evidence reinforces the heterogeneity of pandemic effects. In developing-country contexts,

Feghali et al. (2025) highlight the interplay between financial hardship, social disruption, and limited service access in shaping mental health outcomes among youth. Omotayo and Ogunniyi (2024) show that the crisis extended beyond income shocks, encompassing school closures, care burdens, and informal-sector instability. Bogliacino et al. (2023), using panel data from Italy, Spain, and the UK, estimate that negative labour shocks increased stress, anxiety, and depressive symptoms by approximately 0.16 standard deviations, a substantial effect relative to baseline. In the United States, Adams-Prassl et al. (2022) find that lockdown measures reduced mental health by 0.083 standard deviations, entirely driven by women, resulting in a 61% widening of the gender gap in psychological well-being. Similarly, Bau et al. (2022) show, using extensive phone surveys in rural India, that confinement measures worsened food security and female mental health, particularly among vulnerable households. The consequences of uncertainty have also been explored in family contexts. Carias et al. (2024) show that perceived income risk and economic uncertainty significantly increased anxiety and depressive symptoms among mothers. At a macro level, the World Health Organization (WHO) estimates that over one billion people now live with mental health conditions, with depression and anxiety alone costing the global economy about $1 trillion annually in lost productivity (Organization et al., 2025). Sinyor et al. (2024) further note that employment and income stressors are key determinants of suicide risk and overall mental health deterioration following downturns.

A crucial strand of the literature investigates how economic shocks translate into psychological harm. Income losses reduce household savings and constrain the ability to sustain stable consumption over time, generating immediate financial stress and heightened economic insecurity. Husain et al. (2023) show that declines in per capita expenditure during the pandemic were strongly associated with worsening mental health outcomes in India. Beyond income, employment instability plays a critical role as well. Both Avdic, de New and Kamhöfer (2021) and Bogliacino et al. (2023) find that job insecurity exerts a stronger effect on mental health than actual job loss. Economic uncertainty itself acts as a stressor. Di Quirico (2023) conceptualize this as a "crisis of uncertainty," where expectations about the future amplify anxiety independently of realized shocks. Complementary evidence from Carias et al. (2024) confirms that anticipated financial risk contributes to psychological distress even when incomes remain stable.

The pandemic further introduced non-economic stressors such as social isolation, childcare burdens, and health anxieties. Omotayo and Ogunniyi (2024) emphasize the cumulative nature of these pressures, while Bau et al. (2022) document the link between food insecurity and female mental health. Equally important are the supply-side constraints on mental health care. The WHO reported service disruptions in over 90% of countries during 2020 (Suri, 2022), and Asper et al. (2022) argue that underinvestment in mental health infrastructure prior to the pandemic left systems unable to meet surging demand. Coping

mechanisms and social support also shape resilience. Lu and Lin (2021) develop a conceptual framework linking economic disturbance, coping behaviours, and mental health outcomes, emphasizing that the direction of behavioural responses (whether adaptive or maladaptive) determines long-term well-being trajectories. These mechanisms interact in complex ways, with social capital, welfare design, and prior mental health status moderating the overall impact.

The evidence reveals strong heterogeneity in mental health responses to economic shocks. Women consistently exhibit larger declines in psychological well-being during the pandemic, largely due to disproportionate caregiving burdens, higher rates of informal employment, and exposure to service-sector job losses (Adams-Prassl et al., 2022; Etheridge and Spantig, 2022). Youth and early-career adults also face heightened risks, as education and labour-market disruptions compound uncertainty about future prospects (Essadek et al., 2025; Rajkumar, 2020).

Low-income and financially fragile households are particularly vulnerable. Without access to savings or credit, even modest income shocks can trigger significant psychological distress (Husain et al., 2023). The effects are often more pronounced in low- and middle-income countries, where formal safety nets are limited. In the United States, Couch, Fairlie and Xu (2020) note that conventional unemployment statistics understate economic hardship among African Americans, suggesting that headline indicators may fail to capture the true extent of distress. Cross-country evidence also points to the protective role of welfare-state generosity: nations with stronger unemployment insurance and public health systems exhibit shallower declines in mental health during downturns (Asper et al., 2022).

The growing body of research highlights that mental health deterioration during economic crises is not merely a social concern but also an economic one. The persistence of psychological distress can reduce labour productivity, impair educational attainment, and slow recovery. The WHO estimates that mental illness imposes an annual economic burden exceeding 4% of global GDP (Organization et al., 2025). This study builds on and extends the existing literature in several ways. First, it explicitly distinguishes mental health from other health outcomes, acknowledging their distinct relationship with the business cycle. Second, it isolates the independent effects of income loss and change in working hours thereby providing a clearer understanding of the mechanisms driving psychological distress. Third, it examines heterogeneity across groups of individuals offering new evidence on which of them bear the greatest psychological burden during crises.

3 Institutional Context: The Case of Greece.

Greece broadly followed the euro-area pattern of cushioning employment during the COVID-19 pandemic but exhibited distinctive institutional features that shaped the form of labor market adjustment. Strict con-

finement measures in 2020 triggered one of the deepest economic contractions in the euro area, yet layoffs were legally prohibited, as job-retention schemes became the central policy instrument for preserving employment (Hijzen and Salvatori, 2020). Key measures included the temporary suspension of employment contracts, which entitled affected workers to a flat-rate state allowance while prohibiting dismissals, and the SYN-ERGASIA short-time work scheme, which subsidized earnings losses for employees working reduced hours. Firms operating in suspended sectors could only access public support if they maintained their pre-pandemic headcount (Hijzen and Salvatori, 2020). Consequently, labor market adjustment occurred primarily through reductions in income and working hours rather than outright job separations, with the most pronounced income losses concentrated in seasonal and service-oriented sectors.

Figure 1 illustrates how these institutional mechanisms translated into actual labor market outcomes between 2019 and 2024. The figure plots the annual mean change (by gender) in (a) personal income[1] and (b) weekly working hours among employed individuals who remained in the same occupation (stayers) across consecutive waves. This restriction ensures that the observed changes reflect within-job dynamics rather than shifts arising from job transitions. For each respondent, year-to-year differences in personal income and working hours were computed relative to the previous year[2].

In Panel (a), the vertical axis represents the mean annual change in personal income (in euros). [3] The economic impact of the pandemic is primarily captured in survey year 2021 (reporting income changes between 2019 and 2020). Here, we observe a sharp reversal: men experienced a significant negative income shock (dropping below zero), while the positive income growth trend for women effectively stalled. These losses were amplified by Greece's strong reliance on seasonal employment in tourism: the nationwide lockdown coincided with the onset of the tourism season, a period that normally brings a surge in hiring across many regions. Instead, hiring froze, and although unemployment rose only slightly—driven by the absence of new contracts rather than mass dismissals. The temporary suspension of employment contracts and the widespread use of short-time work schemes preserved jobs but reduced effective earnings. From 2022 onward, incomes rebounded as restrictions eased and labor demand strengthened, though the recovery remained incomplete. Men's income path exhibits stronger volatility, while women's trajectory appears smoother, likely reflecting a higher share of employment in the public sector and essential services.

Panel (b) shows the corresponding year-on-year change in average weekly working hours, where the vertical axis measures deviations from the previous year[4]. Unlike income, working hours are reported

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[1]Personal income changes were winsorized at the 1st and 99th percentiles to limit the influence of outliers.

[2]Weighted means were then calculated by sex and survey year using individual cross-sectional weights.

[3]It is important to note that the income reference period is the previous calendar year ($t-1$). Thus, the data point for survey year 2020 reflects the change in income between 2018 and 2019, showing a positive trend consistent with pre-pandemic growth.

[4]A value of 0.4 corresponds to an increase of roughly 24 minutes per week.

6

at the time of the survey. As a result, the immediate shock is visible in survey year 2020: men's working hours fell sharply, while women's hours rose slightly. Both groups experienced strong rebounds in 2021 as the economy reopened and short-time work schemes supported the return to normal operations. Smaller gains in 2022 indicate a stabilization phase, followed by a pronounced decline in 2023, particularly for men. While the withdrawal of pandemic-related support alone cannot fully explain this pattern, the downturn may also reflect broader post-pandemic adjustments, such as the uneven recovery of certain service and transport-related sectors that affected hours rather than employment. By 2024, working hours partially recovered, suggesting a gradual normalization of labor input.

Taken together, these patterns confirm that labor market adjustment in Greece during the pandemic was channeled primarily through changes in hours and income rather than job losses. Adjustments were characterized by pronounced year-to-year volatility and notable gender asymmetries: men experienced sharper contractions and rebounds in both income and working hours, whereas women's adjustments were smaller. The combination of layoff prohibitions, reliance on job-retention schemes, and disrupted seasonal labor demand frames the interpretation of these results: what appears as a modest rise in unemployment actually masks deeper income and hours compression and a missed hiring cycle. The Greek case thus offers a particularly valuable setting for comparative studies, illustrating how the economic and psychological costs of crises may be concentrated in earnings and labor input rather than employment levels.

Figure 1: Annual change in weekly working hours and personal income in Greece, 2019–2024.

| (a) Personal Income | (b) Weekly Working Hours |
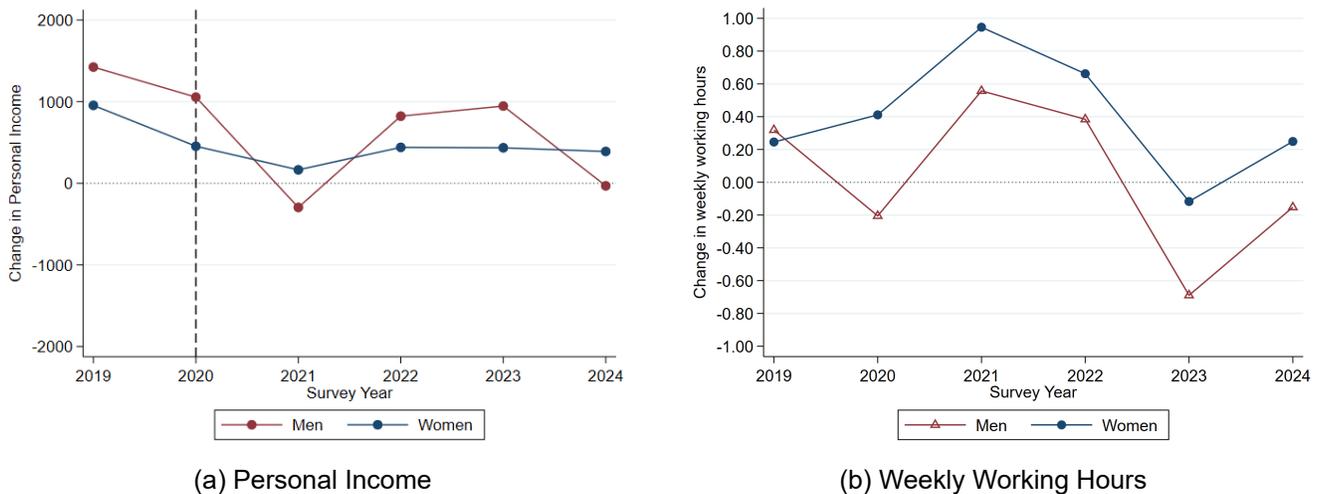
Note: Changes are computed relative to the previous survey wave. Weighted sample restricted to stayers. Source: EU-SILC (ELSTAT).

4   Data Sources and Descriptives

Our analysis is based on the Greek version of the European Union Statistics on Income and Living Conditions (EU-SILC), an harmonized longitudinal survey that tracks individuals and households for up to four years. We exploit the panel dimension of the data and follow individuals in four consecutive waves spanning 2019–-2024. Although detailed information on individual and household characteristics is available throughout this period, information on mental health is collected only in three waves. In particular, the 2021, 2022, and 2023 surveys each ask respondents whether their mental health was affected due to COVID-19 compared to the preceding year (2020, 2021, and 2022, respectively). The question is formulated as: *"Was your mental health affected by the COVID-19 crisis in [year]?"*, with three possible answers: 'yes, negatively affected', 'yes, positively affected' and 'not affected'. Based on this, we construct our main outcome variable: a categorical indicator of self-reported change in mental health relative to the previous year, coded as $+1$ if improved, 0 if unchanged, and -1 if worsened. This measure provides a subjective assessment of year-on-year changes in mental well-being. The information from 2019 and 2024 is used to capture pre-pandemic and post-pandemic characteristics in descriptive analyses, but these years do not include direct measures of mental health change.

To examine how labor market disruptions during the pandemic affected mental health outcomes, we incorporate three sets of mediating variables.The first concerns we focus on *income dynamics* changes in *working hours*. We capture income loss in two complementary ways: (i) a measured indicator based on year-on-year changes in household income using the longitudinal structure of EU-SILC, and (ii) a self-reported indicator derived from direct survey questions. Specifically, respondents are first asked: "Compared to the previous year, has your household income increased, remained more or less the same, or decreased?" Respondents are further asked whether the observed decrease in household income was a direct outcome of COVID-19. Using this information, we construct a categorical variable with three categories: (a) no change in income or income increase, (b) income loss due to COVID-19, and (c) income loss due to other reasons. In sum, our analysis employs both a binary measured income loss variable and a categorical self-reported income loss variable. We measure changes in usual weekly working hours by computing the difference between the current and previous year's hours. Based on this, we constructed change in working hours distinguishing whether an individual's usual hours decreased, increased, or remained unchanged relative to the previous year. We construct a categorical variable accordingly, with no change as the reference category. Other variables used include marital status (unmarried), age group (1: 17-29, 2: 30-39, 3: 40-49, 4: 50-64, 5:65+), participation in leisure activities (regular participation: yes/no), meeting friends/relatives at least once per month (1: yes, 2: no due to financila reasons, 3: no due to other reasons), public sector (yes/no), self-employment(yes/no). Also we include a telework-

ability variable which captures work conditions, operationalized as teleworkability during the COVID-19 restrictions. Measurement is based on respondents' answers to a question on working from home, which records six ordered responses ranging from fully working from home and partially working from home, to various reasons preventing telework. To obtain a person-level, time-invariant proxy for the capacity to telework, we construct a variable of teleworkability using reported ability to work from home, assigning a value of 1 to individuals whose occupation could accommodate remote work in some form and 0 if their job could not be performed remotely.

Even though our main interest lies in explaining how COVID-19 affected mental health through its associated factors, it is important to first provide a broader perspective on the pandemic's impact on overall perception of health. To have an idea on general health perceptions during the pandemic, and before focusing on the COVID-19 effects on mental health, we observe the evolution of self-assessed health (Sah), a generic measure of overall health status widely used in population surveys. In EU-SILC, Sah is measured on a five-point Likert scale where respondents rate their health as 'very good', 'good', 'fair', 'bad' or 'very bad.' Figure 2 shows changes in self-assessed health (SAH) over time by gender. For both men and women, the shares reporting "bad" or "very bad" health rose sharply in 2020–2022, reflecting early pandemic disruptions. Men saw a further increase in "very bad" health in 2023–2024, while women's "bad" health rose more in 2022, indicating gender-specific effects. In contrast, "good" or "very good" health remained stable, suggesting that declines were concentrated among those already in poorer health.

Figure 2: Evolution of the share of population across SAH categories over time and gender.
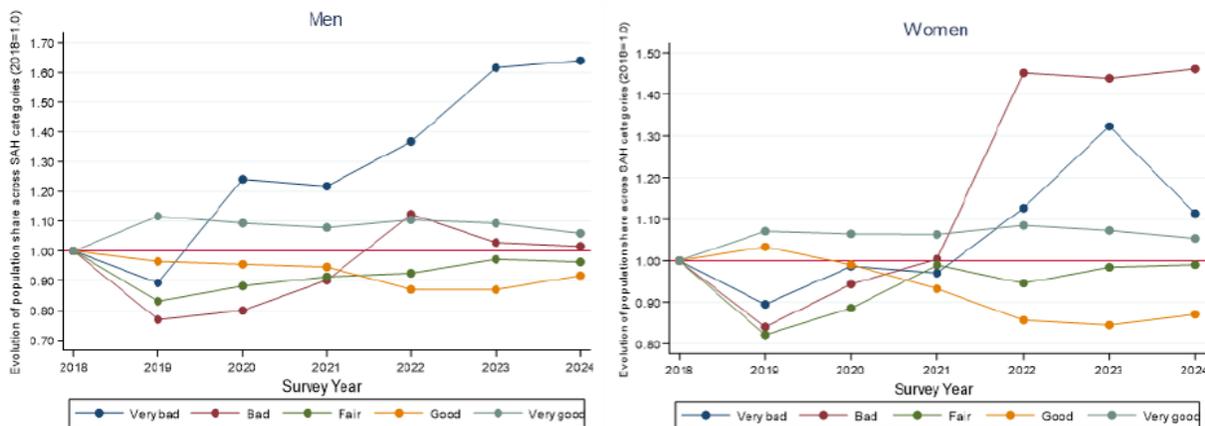
We further rescale this variable into a binary index, with 1 indicating very bad health and 0 very good health, and exploit the panel structure of EU-SILC to construct a within-person change in Sah (*dSah*), defined as the difference between an individual's response in the current year and the previous year, so

that negative values indicate deterioration. We then contrast these patterns with self-reported mental health changes separately for men and women in Figure 3. Both outcomes exhibit declines during the pandemic followed by partial recovery, but the magnitude of deterioration differs substantially. Sah shows a gradual and relatively modest decline around 2020–-2022, with some signs of adjustment thereafter. In contrast, mental health displays a much sharper drop in 2020, reaching its lowest point in 2021, before rebounding somewhat in subsequent years. The comparison underscores that while COVID-19 affected health in general, the deterioration in mental health was far more severe.

Figure 3: Sah vs Mental Health

Sah

Mental Health
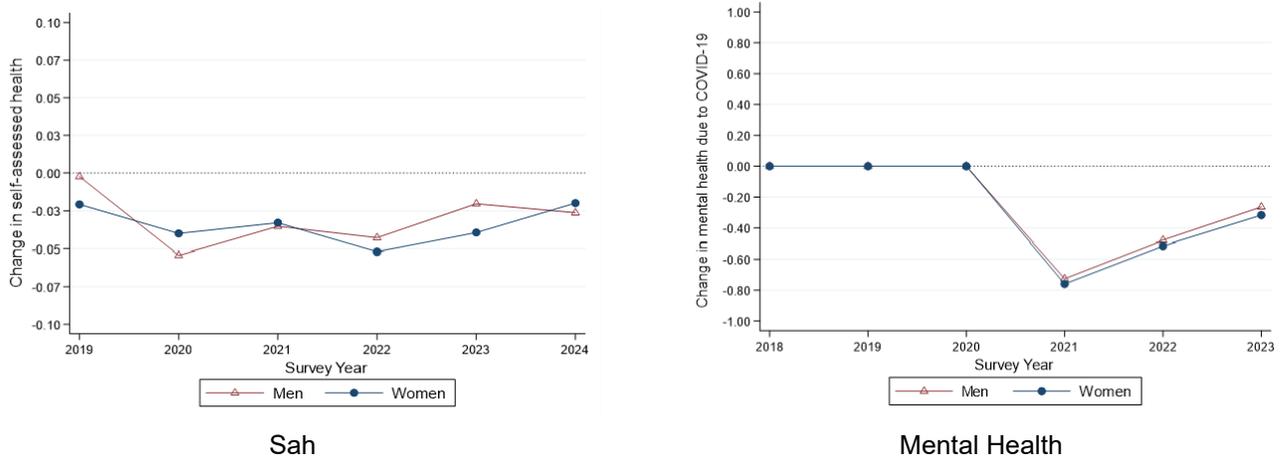
Note: Changes are computed relative to the previous survey wave. Weighted sample. Source: EU-SILC (ELSTAT).

5 Empirical Model

The empirical strategy follows the methodology proposed by Belloni, Carrino and Meschi (2022), which addresses the challenge of endogenous sorting of individuals into occupations by removing time-invariant unobserved heterogeneity. The goal of the empirical strategy is to estimate the impact of income and working hours dynamics on individual mental health outcomes. Establishing causality is empirically challenging due to two main concerns: (i) *endogenous sorting* of individuals into specific jobs based on unobserved, time-invariant personal traits, and (ii) the *endogeneity of occupational change*. These challenges are addressed by adopting a robust panel data methodology that incorporates individual fixed effects (FE), consistent with the literature. Conceptually, individual mental health ($H_{i,t}$) at time t is modeled as a function of key explanatory variables, time-varying controls, and a fixed effect for each individual:

$$H_{i,t} = \boldsymbol{\beta}' \boldsymbol{I}_{i,t} + \boldsymbol{\gamma}' \boldsymbol{W}_{i,t}^{\text{Hours}} + \boldsymbol{\delta}' \boldsymbol{X}_{i,t}^{\text{Controls}} + \boldsymbol{\alpha}_i + \lambda_t + \epsilon_{i,t} \tag{1}$$

where $H_{i,t}$ is the individual mental health outcome variable (in levels). The vector $\boldsymbol{I}_{i,t}$ represents the income variable, $\boldsymbol{W}_{i,t}^{\text{Hours}}$ represents the weekly working hours variable, and $\boldsymbol{X}_{i,t}^{\text{Controls}}$ includes other time-varying controls (e.g., age). The term α_i denotes the *individual fixed effect* capturing all unobserved, time-invariant characteristics such personality traits that influence both job choice and mental health. This component accounts for selection bias arising from sorting into occupations. The term λ_t denotes time fixed effects capturing aggregate shocks common to all individuals. To eliminate the unobserved time-invariant heterogeneity (α_i), the model is estimated using the First-Differences (FD) transformation. The FD transformation removes α_i by modeling only within-individual changes over time, such that ($\alpha_i -$ $\alpha_i) = 0$. Since the dependent variable, mental_health (denoted $M_{i,t}$), is already constructed as the first difference of mental health ($\Delta H_{i,t}$), the estimated model is:

$$M_{i,t} = \beta_1 \Delta \boldsymbol{I}_{i,t} + \beta_2 \Delta \boldsymbol{W}_{i,t}^{\text{Hours}} + \boldsymbol{\delta}' \Delta \boldsymbol{X}_{i,t}^{\text{Controls}} + \Lambda_t + \eta_{i,t} \qquad (2)$$

where $M_{i,t} = \Delta H_{i,t}$ represents the change in mental health between t and $t-1$. The term $\Delta \boldsymbol{I}_{i,t}$ captures income changes, the term $\Delta \boldsymbol{W}_{i,t}^{\text{Hours}}$ captures changes in weekly working hours, and the term $\Delta \boldsymbol{X}_{i,t}^{\text{Controls}}$ includes time-varying covariates, namely age (quadratic), participation in leisure activities (dummy), and frequency of meeting friends (categorical) [5]. Finally, Λ_t denotes the set of time fixed effects (i.year) remaining after differencing. By applying the First-Differences transformation, the model removes any time-invariant unobserved heterogeneity (a_i), thereby addressing potential sorting bias based on stable personality traits.To appropriately account for potential serial correlation in the error term within individuals and across time, standard errors are clustered at the individual level. To mitigate the potential endogeneity of occupational change, the estimation sample is restricted to 'stayers'—individuals who remain in the same occupation across survey waves, consistent with Belloni, Carrino and Meschi (2022). This approach allows us to isolate within-job dynamics and the effects of income and hours changes from broader job displacement dynamics. However, we acknowledge that this restriction might introduce some sample-selection bias, as 'stayers' could represent a more resilient or protected segment of the workforce. To address this, we perform several robustness checks. First, we compare our main findings using the 'stayers' sample with results from the full sample (including both 'stayers' and 'non-stayers'), as shown in Table 3. To address this, we perform several robustness checks. First, we compare our main findings using the 'stayers' sample with results from the full sample (including both 'stayers' and 'non-stayers'), as shown in Table 3.[6]

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[5]Social participation is captured through indicators of leisure activities (cultural, sports, or organized events) and frequency of social contact (meeting friends at least once per month), both associated with protective effects on mental well-being.

[6]An additional robustness test, performed at the suggestion of a referee, involved estimating models on the full sample that allow for differential effects between 'stayers' and 'non-stayers' (i.e., separate coefficients for each group or interaction terms). The findings were consistent with our main conclusions, and detailed results are available upon request.

The model is estimated using OLS on the differenced data. Although the outcome variable takes discrete values (e.g., $-1, 0, 1$), OLS remains a consistent estimator for the average marginal effect within this framework, and its use is well established in the panel data literature [7]. However, results from the ordered probit specification are reported in the Appendix (Tables 5 & 6) as a sensitivity check.

Building on existing evidence that individual characteristics shape both exposure and vulnerability to mental health shocks, we next investigate potential heterogeneity in the observed effects across various population subgroups. Prior theoretical and empirical work shows that the relationship between job-related shocks and mental health is not uniform but varies across demographic and socioeconomic groups. Gender differences are well-documented, with women consistently reporting higher levels of psychological distress during the pandemic. Differences in coping strategies, socioeconomic status, and life-cycle stage also suggest that income and working-hours shocks may have heterogeneous effects by gender and educational attainment (Etheridge and Spantig, 2022; Foremny, Sorribas-Navarro and Castelló, 2024). Educational attainment captures cognitive and socioeconomic resources that may enhance resilience during crises. Age is another important factor shaping individuals' capacity to cope with external stressors such as the COVID-19 crisis (Mendez-Lopez et al., 2022). Pre-existing occupational characteristics also condition mental health responses to labor market shocks. To capture this dimension, we differentiate individuals by employment type—public sector employment, self-employment—and by teleworkability, which reflects the potential to continue working remotely. Teleworkability relates to mechanisms such as continuity of income and hours, changes in social isolation, exposure to infection risk, and shifts in work–life balance, all of which may shape mental health during the pandemic.These dimensions (gender, education, age, family structure, employment type, and teleworkability) form the basis of our heterogeneity analysis. Descriptive statistics for these variables and the distribution of mental health outcomes are presented in Table 1.

–Table 1 around here–

6   Estimation Results

Table 2 reports the OLS estimates for the determinants of changes in mental health among stayers, that is, individuals who remained in the same occupation during the period under consideration. In the stayers sample, income loss is significantly associated with a deterioration in mental health (Model A). Individuals who experienced income loss report mental health scores that are on average lower than those without

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[7]Linear estimation is preferred to nonlinear fixed-effects models such as the ordered probit or logit, which are prone to the incidental parameters problem in short panels and complicate the interpretation of coefficients. In contrast, the OLS estimator directly captures the average within-person effect of a change in a covariate on the expected change in mental health, offering a robust and transparent approach to causal inference.

income loss (-0.029, $p < 0.05$). Given the outcome scale, this effect represents a modest yet statistically meaningful shift toward worse mental health among financially affected workers. By contrast, Model B, which relies on self-reported COVID-related and other income-loss categories, does not yield statistically significant coefficients for either type of loss. The divergence between the significance of the effect in Model A and Model B may reflect differences in measurement precision or reporting biases. These variables capture related but not identical groups: measured income drops reflect measured earnings declines, whereas COVID-related losses depend on workers' own interpretation of the shock. Moving to the third model (C), changes in working hours show no significant association with mental health.

Results for the full sample (Table 3) confirm the negative relationship between income loss and mental health deterioration. The estimated coefficient on measured income loss (-0.028, $p < 0.01$) is roughly the same to that observed for stayers, reinforcing the robustness of the effect across the broader population. Reported income loss by cause again show no significant differences, and changes in working hours remain statistically insignificant.

Across both samples, age follows an inverted-U pattern: mental health improves modestly with age but declines at older ages. Engagement in leisure activities is positively and significantly related to mental health, while meeting friends does not seem to be a protective factor. Finally, the year dummies show a clear time pattern. Specifically, mental health worsened sharply in 2021 and remained substantially below pre-pandemic levels in 2022 and 2023. While the overall patterns point to income-related shocks as a central factor in the sustained deterioration of mental health, it is important to recognize that the drivers of mental health are unlikely to be uniform across all individuals. People differ in terms of their labor market status, role within the household, family responsibilities, and other circumstances that may vary across demographic, occupational, and social groups. Exploring these differences can shed light on the nuanced ways in which the COVID-19 crisis affected mental health and help identify which factors were most salient for which groups of the individuals.

[Tables 2 and 3 around here]

Table 4 presents estimates of heterogeneous effects of the COVID-19 crisis on mental health across gender, age, education, teleworkability, employment sector, and occupation groups. The results reveal important gender differences in the impact of income and work-related shocks. Among men, measured income loss is associated with a statistically significant decline in mental health (-0.040, $p < 0.05$), whereas for women the coefficient is smaller and not significant. Conversely, women appear more affected by reductions in working hours, with a positive and significant coefficient (0.058, $p < 0.10$). These patterns may reflect underlying differences in family roles and responsibilities: women often bear a larger share of household and caregiving duties, so decreasing working hours could have a greater impact on their

well-being. Overall, income shocks weigh more heavily on men, whereas adjustments in working hours appear to affect women more strongly.

Turning to age groups, the results indicate that the mental-health associations of income loss tend to be more concentrated among the youngest age group (17 - 29) (-0.082, $p < 0.10$) and older working-age individuals (50 - 64) (-0.049, $p < 0.05$). For older individuals (65+), point estimates remain negative but are not statistically significant. These findings suggest that mid- to late-career workers experienced the strongest deterioration in mental health in response to income losses, potentially reflecting higher financial obligations and family responsibilities. For younger adults, the pronounced patterns may be linked to greater economic uncertainty.

Differences by education are also evident. Individuals with secondary education display the strongest and most consistent negative associations: both measured (-0.033) and COVID-related income losses (-0.049) are associated with significant declines in mental health. By contrast, tertiary-educated respondents appear more resilient to general measured income losses, which are either small or insignificant, but show a positive and significant response to income losses subjectively attributed to COVID-19 (0.125, $p < 0.01$). This contradicting finding may reflect several factors. First, COVID-specific losses may be perceived as temporary, lessening their psychological implications. Second, the subgroup experiencing COVID-related losses may differ in composition from those experiencing general income shocks. For this group, increases in working hours also appear to be a protective factor (0.07, $p < 0.01$), suggesting that engagement in more tasks may help alleviate the psychological associations of earnings fluctuations. Taken together, these patterns highlight that the mental-health associations of income shocks are influenced not only on objective earnings changes but also on perceptions, context, and subgroup characteristics.

Among those in non-teleworkable occupations, measured income loss has a significant negative effect on mental health (-0.027, $p < 0.10$). By contrast, for individuals in teleworkable occupations, COVID-related income losses are associated with improved mental health (0.093, $p < 0.05$), with a similar positive effect observed for increases in working hours (0.078, $p < 0.05$). This pattern may indicate that flexibility in work arrangements or the ability to remain productive during the pandemic could mitigate the negative effects of income shocks.

The results by employment sector reveal contrasting patterns in how income and work-related characteristics affected mental health. Private-sector workers experienced significant declines in mental health following non-COVID income losses (-0.087, $p < 0.05$), whereas public-sector employees show a positive association between COVID-related income losses and mental health (0.056, $p < 0.10$), possibly reflecting greater job security or perceptions that pandemic-related reductions were temporary. For private-sector workers, increasing working hours appears protective against deteriorating mental health (0.047,

$p < 0.10$), suggesting that continued engagement in work may help offset the stress of income losses. Among the self-employed, reductions in working hours are associated with improved mental health (0.064, $p < 0.05$), consistent with the idea that workload flexibility can relieve stress for those managing their own businesses. In contrast, for employees, increasing working hours is protective (0.041, $p < 0.05$), while income loss has a modest negative effect (-0.028, $p < 0.10$). These patterns suggest that sector-specific conditions, job security, and autonomy may shape how workers respond to economic disruptions.

Taken together, these results reveal substantial heterogeneity in the mental-health effects of the COVID-19 crisis. Income shocks have the most pronounced adverse effects among men, mid-aged, and those employed in the private sector or in low skilled occupations, highlighting the intersection of economic vulnerability and occupational exposure. In contrast, some groups, particularly highly educated and workers in teleworkable positions, seem to be better off, possibly due to greater job flexibility, perceptions of temporary income losses, or continued engagement in meaningful work tasks. The patterns across age, gender, education, occupation, and sector suggest that likely both objective conditions (e.g., earnings reductions, work hours, sectoral stability) and subjective perceptions (e.g., framing of income losses, workload control) shape mental-health outcomes during periods of economic stress. Overall, these findings underscore the unequal distribution of mental-health risks during the pandemic and highlight the importance of socioeconomic position, employment context, and labor-market characteristics in determining vulnerability to economic shocks. They also point to the need for targeted policy interventions and workplace strategies that consider the specific circumstances of different groups, addressing both financial security and work-related conditions to mitigate the psychological impact of future crises.

[Table 4 around here]

7   Conclusions and Discussion

Greece's pandemic response combined strict lockdowns with extensive employment protection measures, which limited mass layoffs but shifted the main margin of adjustment to income dynamics. This distinctive institutional setting provides a valuable case study for understanding how labour-market shocks influence psychological well-being. Our analysis yields three key findings.

First, results indicate that measured income loss significantly worsened mental health, confirming that financial insecurity was a central driver of psychological distress during the pandemic. Reductions in working hours tended to increase distress in some specifications, suggesting that stable labour-market attachment and income continuity offered protective effects against pandemic-related stress.

Second, the heterogeneity analysis reveals that these effects were not uniformly distributed across population groups. In terms of gender, income loss adversely affected men more strongly, whereas

15

women's mental health appeared more sensitive to reductions in working hours. This pattern aligns with international evidence that the pandemic intensified gendered burdens, such as unpaid care responsibilities and concentration in more precarious employment sectors. By contrast, male respondents, often primary earners, were more affected by direct income losses.

Age-based heterogeneity was also notable. The mental health of younger individuals (17-29) appeared highly sensitive to income changes, though estimates were imprecise due to smaller sample sizes. The most statistically robust effects emerged among individuals aged 50-64, for whom income losses significantly reduced psychological well-being. These results may reflect both heightened financial vulnerability among working-age adults nearing retirement and greater resilience among older cohorts (65+) due to stable pension income or reduced labour-market exposure.

Educational differences reveal a clear gradient: individuals with secondary education experienced the largest and most consistent mental health deterioration from income losses, while tertiary-educated individuals showed a positive response to COVID-specific income shocks. This could suggest that higher-educated respondents, more likely in teleworkable or professional roles, interpreted such shocks as temporary and less threatening to long-term security. Supporting this view, teleworkable workers experienced smaller or even reversed mental health effects from income changes, perhaps due to greater job flexibility and perceived safety.

Sectoral and occupational results further underscore this heterogeneity. Private-sector employees and service/sales workers faced pronounced negative impacts from income losses, reflecting their greater exposure to pandemic disruptions. In contrast, public-sector employees and professionals often experienced positive or insignificant effects from COVID-related income changes, consistent with stronger job protection and lower uncertainty. Self-employed workers, conversely, reported improved well-being following increases in working hours, potentially reflecting recovery in business activity after initial lockdowns.

Taken together, these results highlight the uneven distribution of mental health risks during the pandemic and the importance of considering labour-market characteristics such as teleworkability, sector, and education in understanding psychological vulnerability. They also illustrate that even when formal employment is preserved, shocks to income and working time can substantially affect well-being.

From a theoretical perspective, these findings contribute to broader debates in labour and health economics, particularly within the framework of Grossman's health capital model (Grossman, 1972). Income and job instability reduced households' capacity to invest in mental health and accelerated the depreciation of existing health capital by heightening stress and uncertainty. The Greek case underscores that financial and psychological insecurity can arise even in the absence of widespread unemployment, emphasizing the need to account for non-traditional labour-market shocks in health capital accumulation

16

dynamics.

Policy implications follow directly. Measures that stabilise household income, such as targeted transfers, wage subsidies, and job-retention schemes are essential to mitigate the psychological costs of economic crises. Equally, stabilising working hours and providing flexible work arrangements can help sustain well-being, particularly for women balancing paid and unpaid care work. Given the observed heterogeneity across gender, education, and sector, interventions should be both gender-sensitive and occupation-specific. Moreover, economic support policies must be integrated with mental-health services, ensuring access to counselling, telehealth, and community networks when in-person care is disrupted.

Recent research further suggests that economic uncertainty itself can trigger mental distress (Carias et al., 2024; Di Quirico, 2023). Thus, beyond direct financial support, policies that stabilise expectations through credible social insurance systems and clear communication may yield both economic and psychological benefits. Finally, future research should examine whether the mental health consequences of temporary income and hours shocks persist over time. Longitudinal approaches could clarify whether such disruptions leave lasting scars on well-being, labour productivity, or broader measures of social participation. By linking short-term shocks to long-run health and economic outcomes, future work can deepen our understanding of the cumulative effects of crises on human capital and resilience.

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Tables

Table 1: Mental-health change distribution by subgroup.

Group	Decreased (%)	Same (%)	Increased (%)	Obs.
Main Mediators				
No change/increase in Income (measured)	36.13	63.32	0.55	15,167
Loss of Income (measured)	50.74	48.75	0.50	12,887
No change/increase in Income (reported)	52.41	47.01	0.58	23,752
Loss of Income due to COVID-19 (reported)	63.47	36.03	0.50	2,395
Loss of Income due to other reasons (reported)	55.56	43.62	0.82	1,951
Decrease in working hours	39.37	59.83	0.80	2,116
No Change in working hours	43.31	56.21	0.48	23,989
Increase in working hours	33.72	65.98	0.30	11,359
Age indicators				
age: 17-29	32.08	67.59	0.33	3,604
age: 30-39	32.88	66.47	0.64	3,266
age: 40-49	35.90	63.43	0.67	5,707
age: 50-64	42.93	56.61	0.45	10,572
age: 65+	43.56	56.12	0.33	14,315
Demographics / social				
Males	38.14	61.39	0.47	17,908
Females	42.04	57.54	0.42	19,556
Unmarried	33.19	66.46	0.34	7,559
Primary Education	41.22	58.42	0.36	28,768
Secondary Education	36.36	62.92	0.72	4,329
Tertiary Education	36.94	62.25	0.81	3,460
Meet friends*: Yes	38.92	60.57	0.51	28,052
Meet friends: No (financial reason)	41.60	58.11	0.29	3,769
Meet friends: No (other reason)	45.49	54.28	0.23	5,643
Regular Leisure activities = 1	36.50	62.87	0.64	12,048
Self-employed	38.86	60.59	0.55	4,918
Teleworkable Occupation	38.80	60.51	0.69	2,892
Public sector	36.76	62.74	0.50	4,576
Total sample	40.18	59.38	0.44	37,464

Source: EUSILC (Hellenic Statistical Authority, ELSTAT). Notes: Mental-health coding: -1 = decreased, 0 = same, +1 = increased. *: at least once per month.

Table 2: The COVID-19 Effect on Mental Health: OLS Estimates (Stayers Sample)

	Model A	**Model B**	**Model C**
Variables	Income Loss (measured)	Income Loss (reported)	Hours Change
Loss of Income	-0.029**		
	(0.013)		
Income loss (COVID-19)		0.011	
		(0.017)	
Income loss (other)		0.001	
		(0.025)	
Hours reduced			0.014
			(0.020)
Hours increased			-0.000
			(0.021)
Age	0.014***	0.009**	0.014***
	(0.004)	(0.004)	(0.004)
Age^2	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Leisure activities	0.015	0.035***	0.016
	(0.014)	(0.013)	(0.014)
Friends: No—financial reason	-0.024	-0.025	-0.024
	(0.031)	(0.027)	(0.031)
Friends: No—other reason	-0.002	0.017	-0.001
	(0.028)	(0.024)	(0.028)
Year 2021	-0.899***	-0.811***	-0.914***
	(0.093)	(0.084)	(0.093)
Year 2022	-0.556***	-0.502***	-0.572***
	(0.093)	(0.084)	(0.093)
Year 2023	-0.391***	-0.330***	-0.401***
	(0.093)	(0.084)	(0.093)
Observations	7,207	8,867	7,221
R^2	0.507	0.544	0.507

Notes: Weighted OLS regressions for stayers (same ISCO across waves). Dependent variable: mental health index. Robust standard errors in parentheses. Controls include only time varying characteristics: quadratic age term, leisure activity, and frequency of meeting friends and year dummies (base year 2020 omitted). Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 3: The COVID-19 Effect on Mental Health: OLS Estimates (Full Sample)

	Model A	Model B	Model C
Variables	Income Loss (measured)	Income Loss (reported)	Hours Change
Loss of Income	-0.028***		
	(0.009)		
Income loss (COVID-19)		-0.005	
		(0.014)	
Income loss (other)		-0.016	
		(0.016)	
Hours reduced			0.009
			(0.015)
Hours increased			-0.011
			(0.016)
Age	0.015***	0.011***	0.015***
	(0.002)	(0.002)	(0.002)
Age^2	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Leisure activities	0.019*	0.031***	0.020*
	(0.010)	(0.010)	(0.010)
Friends: No—financial reason	0.012	0.009	0.011
	(0.018)	(0.016)	(0.018)
Friends: No—other reason	-0.024	-0.004	-0.023
	(0.020)	(0.017)	(0.020)
Year 2021	-0.908***	-0.819***	-0.922***
	(0.048)	(0.046)	(0.048)
Year 2022	-0.550***	-0.504***	-0.565***
	(0.048)	(0.046)	(0.048)
Year 2023	-0.418***	-0.366***	-0.428***
	(0.047)	(0.045)	(0.047)
Observations	14,129	16,645	14,158
R^2	0.504	0.535	0.504

Notes: Weighted OLS regressions for full working-age sample (18–64). Dependent variable: mental health index. Robust standard errors in parentheses. Controls include only time varying characteristics: quadratic age term, leisure activity, and frequency of meeting friends and year dummies (base year 2020 omitted). Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4: Mental Health Change due to COVID-19: Heterogeneous Effects.

	Income Loss (measured)	Income Loss (COVID-19)	Income Loss (other)	Hours Drop	Hours Increase	Obs.
Gender						
Males	-0.040**	0.004	-0.019	-0.016	0.023	4,197
	(0.017)	(0.022)	(0.031)	(0.025)	(0.019)	
Females	-0.013	0.023	0.029	0.054**	0.047***	3,010
	(0.021)	(0.027)	(0.039)	(0.031)	(0.023)	
Age Groups						
17–29	-0.082*	0.086	0.055	-0.036	0.052	442
	(0.048)	(0.055)	(0.095)	(0.089)	(0.033)	
30–39	0.006	0.036	0.018	0.007	-0.011	1,071
	(0.031)	(0.046)	(0.065)	(0.048)	(0.020)	
40–49	-0.008	-0.016	0.030	0.034	0.015	2,155
	(0.024)	(0.030)	(0.047)	(0.036)	(0.014)	
50–64	-0.049**	0.011	-0.025	0.006	0.007	3,210
	(0.020)	(0.026)	(0.034)	(0.028)	(0.012)	
65+	-0.060	-0.039	-0.149*	-0.102	-0.016	329
	(0.067)	(0.082)	(0.083)	(0.099)	(0.041)	
Education						
Primary	-0.053	-0.004	0.075	0.010	-0.047	856
	(0.041)	(0.042)	(0.074)	(0.062)	(0.043)	
Secondary	-0.033**	-0.049**	-0.002	0.025	0.019	3,786
	(0.017)	(0.021)	(0.032)	(0.027)	(0.020)	
Tertiary	-0.008	0.125***	-0.026	-0.005	0.070	2,565
	(0.022)	(0.035)	(0.043)	(0.034)	(0.007)	
Teleworkability						
Teleworkable	-0.022	0.093**	0.012	-0.036	0.077**	1,753
	(0.026)	(0.045)	(0.058)	(0.041)	(0.031)	
Non-teleworkable	-0.027*	-0.005	-0.004	0.022	0.011	5,256
	(0.015)	(0.019)	(0.027)	(0.022)	(0.017)	
Sector / Employment						
Public sector	-0.003	0.056*	0.052	-0.038	-0.042	2,340
	(0.022)	(0.032)	(0.045)	(0.040)	(0.030)	
Private sector	-0.037	-0.019	-0.087**	-0.012	0.047**	2,338
	(0.023)	(0.030)	(0.041)	(0.037)	(0.025)	
Self-employed	-0.029	-0.033	-0.014	0.064**	0.031	2,528
	(0.023)	(0.028)	(0.038)	(0.029)	(0.023)	
Employee	-0.028*	0.026	0.006	-0.020	0.041***	4,679
	(0.016)	(0.022)	(0.032)	(0.027)	(0.019)	

Notes: Coefficients with robust standard errors in parentheses. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Regressions include only time varying characteristics: age (quadratic), leisure activities, meeting friends, and year dummies (base year 2020 omitted). Numbers rounded to three decimals. Sample: Stayers.

Appendix

Table 5: The COVID-19 Effect on Mental Health: Ordered Probit Marginal Effects (Stayers Sample)

Variable	Model A: Income Loss (measured)			Model B: Reported Income Loss			Model C: Hours Change		
	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better
Loss of income	0.027**	-0.026**	-0.002**						
	(0.012)	(0.012)	(0.001)						
Income loss (COVID-19)				-0.011	0.010	0.001			
				(0.017)	(0.016)	(0.001)			
Income loss (other)				-0.004	0.004	0.000			
				(0.024)	(0.022)	(0.002)			
Hours drop							-0.015	0.014	0.001
							(0.018)	(0.017)	(0.001)
Hours increase							-0.001	0.001	0.000
							(0.020)	(0.018)	(0.001)
Observations		7,207			8,867			7,221	

Notes: Average marginal effects (AMEs) from ordered probit regressions with robust standard errors in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Dependent variable: mental health. Controls include quadratic age, leisure activities, and meeting friends. Sample: stayers (individuals with the same job).

Table 6: The COVID-19 Effect on Mental Health: Ordered Probit Marginal Effects (Full Sample)

Variable	Model A: Income Loss (measured)			Model B: Reported Income Loss			Model C: Hours Change		
	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better
Loss of income	0.025***	-0.024***	-0.001***						
	(0.009)	(0.009)	(0.001)						
Income loss (COVID-19)				0.005	-0.005	0.000			
				(0.014)	(0.013)	(0.001)			
Income loss (other)				0.013	-0.013	-0.001			
				(0.015)	(0.014)	(0.001)			
Hours drop							-0.010	0.009	0.001
							(0.014)	(0.014)	(0.001)
Hours increase							0.008	-0.008	0.000
							(0.015)	(0.014)	(0.001)
Observations		14,129			16,645			14,158	

Notes: Average marginal effects (AMEs) from ordered probit regressions with robust standard errors in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Dependent variable: mental health. Controls include quadratic age, leisure activities, and meeting friends. Sample: working-age individuals (full sample).

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