

Does paying your debt make you happy during the pandemic?

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This study investigates the relationship between happiness and household debt repayments during the COVID-19 pandemic in the UK. Utilizing a Bayesian Vector Autoregressive (VAR) model with time-varying conditional mean equations, we treat our n-dimensional model as a collection of n univariate estimation problems. Cross-dependence is addressed using a student-t skewed distribution with latent autoregressive factors. Our findings suggest that the pandemic has led to a decline in happiness, but an increase in household debt repayments appears to have a positive effect on happiness. Interestingly, various government interventions, including lockdown measures, pharmaceutical interventions such as vaccination policies, and financial support measures like income support and debt relief, are associated with increased happiness and life satisfaction. However, stay-at-home policies are linked to heightened anxiety.

Keywords: Happiness; household debt repayments; COVID-19; Bayesian VAR.

JEL Codes: C11, I3, D1.

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1. Introduction

The COVID-19 pandemic profoundly impacted various facets of economic and social life, both domestically in the UK and globally. Reports from reputable sources such as the OECD (2021) highlighted a surge in anxiety levels, a sentiment echoed by studies like Wang et al. (2020). Additionally, data from the Office of National Statistics (ONS, 2022) underscored a significant decline in individual wellbeing across the UK during the pandemic period.

Furthermore, insights from the Bank of England (Money and Credit, May 2020) revealed a noteworthy trend: in April 2020, households in the UK repaid a staggering £7.4 billion in consumer credit. This marked the largest monthly net repayment recorded since the inception of the series, occurring just one month into the onset of the pandemic. As the pandemic persisted and stringent lockdown measures endured throughout 2021 and early 2022, household debt repayments witnessed a sharp decline.

Indeed, the impact of the COVID-19 pandemic on household finances and debt repayment, as highlighted by the initial report from the Bank of England in April 2020, reveals a profound shift in consumer behaviour and financial dynamics. The onset of the pandemic thrust many individuals into a state of uncertainty regarding employment prospects and income stability. Faced with this uncertainty, households may have opted to prioritize debt repayment to fortify their financial resilience and alleviate future financial burdens. Simultaneously, the implementation of lockdown measures and restrictions on non-essential activities resulted in diminished opportunities for discretionary spending. Consequently, households may have redirected funds that would typically be allocated to non-essential expenses towards debt repayment. The economic uncertainty precipitated by the pandemic likely prompted many individuals to reassess their financial priorities and adopt more cautious financial practices. From a broader perspective, increased household debt repayments contribute to financial

stability by mitigating systemic risks associated with excessive consumer indebtedness. However, it remains crucial to monitor the ramifications of debt repayments on overall wellbeing. While reducing debt can alleviate financial strain and enhance financial security, the psychological impact of debt repayment on individual and household wellbeing warrants careful consideration and analysis.

Muresan et al. (2023) showed that COVID-19 pandemic has led to a notable decline in overall wellbeing compared to the preceding period while individuals express expectations of improved happiness in the future (see also Canto et al. 2022). Muresan et al. (2023) also argued that the financial strain and the imposition of restrictive measures has exacerbated the negative effects on wellbeing. Consequently, people exhibit greater pessimism regarding both their future happiness and financial stability. Santo et al. (2022) examines the COVID-19 pandemic's effects on household earnings and the policy responses of the governments of four EU countries - Belgium, Italy, Spain, and the UK. Using the European tax-benefit model EUROMOD in conjunction with COVID-19-related household surveys and timely labour market data, they create counterfactual scenarios to give comparative evidence on the degree of relative and absolute welfare resilience at the start of the pandemic. They discover that while inequality essentially stayed the same, income poverty rose as a result of the epidemic in every country. There are four key reasons why policies differ in their effects between countries: the asymmetric nature of the shock in each nation, the various protections provided by each tax-benefit system, and the variations in the design of discretionary

Building on the insights from Muresan et al. (2023) and Canto et al. (2022), our study examines the potential correlation between household debt repayments and individual wellbeing, particularly focusing on happiness during the COVID-19 pandemic. Inspired by the framework proposed by Kahneman and Krueger (2006), which emphasizes the importance

of assessing wellbeing through happiness as a lens to unveil household financial preferences, our analysis delves into the intricate interplay between individual happiness, household debt repayments, and the dynamics of the pandemic. In addition, recent literature on psychological and behavioural economics has been focusing on the connection between financial conduct and mental health, wellbeing. Barrafreem et al. (2020) challenge that while the (inter)national economic conditions are not linked to a decline in financial well-being, pessimism, during COVID-19, about the future family economic status and financial ignorance are detrimental for wellbeing. A survey of 1222 Brazilians was conducted by Kelmara et al. (2021) using multi-group invariance testing and structural equation modelling. Their findings show that financial risk and anxiety levels have an impact on poorer financial well-being during COVID-19. According to Kleimeier et al. (2023), the COVID-19 pandemic caused a rise in subjective financial fragility.

Acknowledging the complex and evolving dynamics among these variables, we adopt a unique Bayesian Vector Autoregressive (VAR) model, incorporating a student-t, time-varying, skewed copula. This modelling approach offers the necessary flexibility to accurately capture the dynamics of diverse data series, while its estimation techniques remain accessible. The novelty of this methodology is that it takes advantage of the Bayesian framework, which enables the incorporation of prior information and probabilistic reasoning to improve the estimation of complex relationships between variables. This modelling approach offers both flexibility and accessibility, making it a powerful tool for analysing the intricate, dynamic interrelations among happiness, financial behaviour, and pandemic outcomes. Happiness and debt repayments, for instance, could be affected by changing economic conditions during the pandemic, while infections and deaths might impact individual well-being and financial priorities. The time-varying copula allows for capturing these shifting dynamics in a coherent

and statistically robust manner. This combination of time-varying and Bayesian techniques makes the approach highly adaptable to real-world situations where data and relationships are constantly evolving, ensuring accurate modelling of these complex interactions.

Given the dynamic nature of happiness, debt repayments, and COVID-19 infections and deaths, the incorporation of a time-varying copula within the Bayesian VAR framework is deemed appropriate, treating these variables as endogenous. The subsequent section details our methodology in Section 2. Section 3 presents the data, while section 4 showcases the results, and Section 5 concludes with insights and policy implications.

2. Methodology: Bayesian Vector Autoregressive (VAR)

In this study, we employ a Bayesian Vector Autoregressive (BVAR) modeling to reveal the dynamic interactions among our endogenous variables. It extends the classical Vector Autoregressive (VAR) model by incorporating Bayesian inference methods for parameter estimation and uncertainty quantification. Moreover, our Bayesian VAR models would rely on Markov Chain Monte Carlo (MCMC) sampling methods to draw samples from the posterior distribution of model parameters. There are multiple advantages for using Bayesian VAR: this modeling provides a flexible and powerful framework for analysing multivariate time series like in this case, incorporating uncertainty estimation, and capturing complex dynamic relationships among endogenous variables.

We start by defining those endogenous variables as $y_t = [y_{it}]$, $i = 1, \dots, n$; $t = 1, \dots, T$, be a vector of endogenous variables. In our case we have six, i.e., life satisfaction, happiness, anxiety, confirmed cases (infections), confirmed deaths and total household debt repayments.

We assume the marginal distributions are student-t with stochastic volatility.¹ Our model for each equation of the VAR is, thus, as follows.

$$y_{it} = W_{it}\beta_{y,i} + \gamma_{y,i}\delta_{it} + \delta_{it}^{1/2}e^{h_{it}/2}\varepsilon_{y,it}, \varepsilon_{y,it} \sim N(0,1).$$

$$h_{i,t+1} = \mu_{h,i} + \phi_{h,i} + (h_{i,t} - \mu_{h,i}) + \sigma_{h,i}\varepsilon_{h,it}, \varepsilon_{h,it} \sim N(0,1). \quad (1)$$

$$\delta_{it} \sim \text{Inv - Gamma} \left(\frac{\nu_{y,i}}{2}, \frac{\nu_{y,i}}{2} \right), \text{corr}(\varepsilon_{y,it}, \varepsilon_{h,it}) = \rho_i.$$

where W_{it} is the matrix of regressors, that includes lags of y_{it} and exogenous variables which are government interventions to combat the pandemic (i.e., workplace closing and debt contract relief) with coefficients $\beta_{y,i}$, h_{it} is log-volatility, $\nu_{y,i}$ denote the degrees of freedom, $\gamma_{y,i}$ denotes the skewness, and ρ_i is a leverage parameter. Lastly $\mu_{h,i}$, $\phi_{h,i}$, $\sigma_{h,i}$ are unknown parameters.

The copula realizations are denoted $u = (u_{it}, i = 1, \dots, n)$ and are represented as

$$u_t \sim p(u_t | \Lambda_t, X_t, \theta) \quad (2)$$

¹ We opt for student-t priors because it has heavier tails compared to the normal distribution, making it more robust to outliers. This fits our data set of Covid 19 that contains extreme values and uncertainties. In addition, the student-t distribution controls for the degrees of freedom, which allows for flexibility in modelling. When the degrees of freedom are low, the distribution resembles a heavy-tailed distribution, and as the degrees of freedom increase, it approaches a normal distribution. In some detail, the student-t priors are robust to outliers because it has heavier tails compared to the normal distribution, which makes it more robust to outliers. In situations where extreme values or outliers are present in the data, like in the case of Covid 19 period, using Student's t-distribution as priors can help prevent these outliers from unduly influencing parameter estimates. In addition, the Student's t-distribution is characterised by a parameter known as the degrees of freedom (ν). As the degrees of freedom increase, the distribution approaches a normal distribution. This flexibility enables the model to capture different levels of tail thickness and adapt to the data's characteristics. By adjusting the degrees of freedom parameter, practitioners can strike a balance between flexibility and parsimony in the model. Lower degrees of freedom allow for more flexibility, accommodating heavy-tailed distributions and outliers, while higher degrees of freedom provide a smoother approximation to a normal distribution, promoting parsimony and simplicity in the model.

$$\Lambda_{t+1} = \mu + \Phi_\lambda + (\Lambda_t - \mu) + \eta_t, \eta_t \sim N(0, \Sigma)$$

where $p(\cdot)$ is a given density (a skewed student- t in our case), Λ_t is an unobserved state-variable vector, $X_t = (X_{it}, i = 1, \dots, n)$ is a vector of observed data (as defined below), and θ contains all unknown parameters in $\mu, \Phi_\lambda, \Sigma, \eta_t$ is the error term.

Unlike Creal and Tsay (2015) we do not assume that Σ is diagonal. In this model, the dependence structure of the conditional copula is time varying as it depends on the state variables Λ_t . The parameters of the model are $\psi_i = (\beta_{y,i}, \gamma_{y,i}, \phi_{h,i}, \mu_{h,i}, \sigma_{h,i}^2, \rho_i, \nu_{y,i})$. Priors for the parameters of the model are in the online appendix of Creal and Tsay (2015).

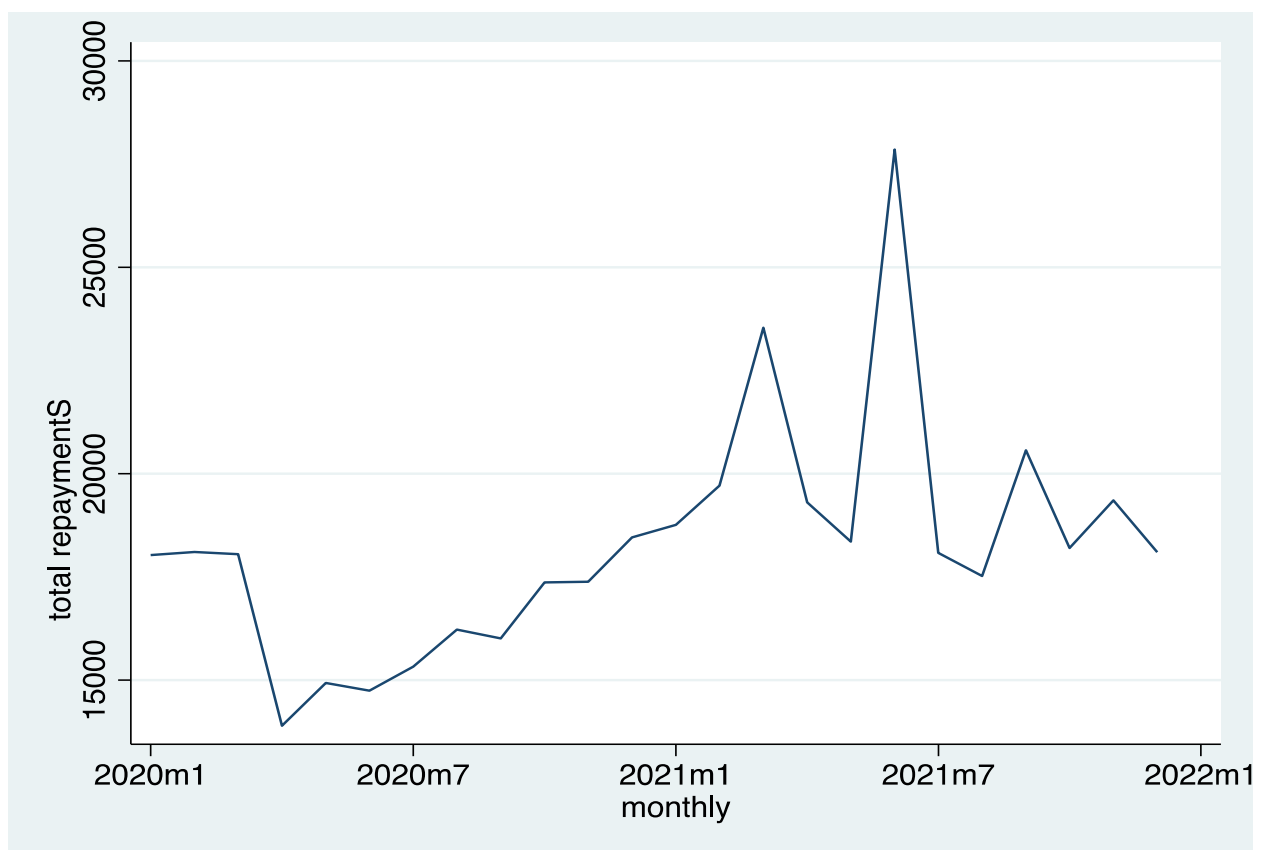
3. The Data Set

The COVID-19 confirmed cases of infections and deaths are from the Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et al. 2021). Household debt repayments come from the Money and Credit statistics of the Bank of England and the Business Impact of COVID-19 Survey (Business insights and impact on the UK economy, BICS) of the Office of National Statistics. The wellbeing data come from Office of National Statistics (2022) that reports personal well-being in the UK.

It is clear from Figure 1 that the total debt repayments of secured lending by individuals in the UK have exhibited significant fluctuations since the onset of the COVID-19 pandemic in January 2020. The observed patterns reflect the dynamic impact of the pandemic on household finances and consumer behavior. There was an initial spike during the first lockdown in April 2020. The hike in household debt repayments during the first lockdown in April 2020 likely reflects a combination of factors. Economic uncertainty and concerns about job security may have prompted individuals to prioritize debt repayment as a means of enhancing financial stability during a period of heightened uncertainty. There is a subsequent decline and rebound

with third lockdown in June 2021. This drop in household debt repayments following the initial spike suggests a potential easing of financial pressures as government support measures and economic stimulus efforts took effect. However, with the onset of the third lockdown in June 2021, there appears to be a renewed increase in debt repayments, possibly driven by renewed economic uncertainty and caution among consumers. Since July 2021, there were notable drop and fluctuations. The notable drop in household debt repayments in July 2021 followed by fluctuations around £18,400 million thereafter indicate a period of relative stability but with ongoing volatility. These fluctuations may reflect changing economic conditions, shifts in consumer confidence, and the evolving impact of pandemic-related restrictions and policy interventions.

Figure 1: Household total repayments in the UK.



Source: Total repayments of secured lending by individuals (in sterling millions), Bank of England (Money and Credit).

This roller coaster-type movement observed in household debt repayments emphasizes the high volatility and uncertainty surrounding financial decisions during the pandemic. The unpredictable nature of the pandemic, coupled with varying degrees of government interventions and economic stimuli, has likely contributed to the observed fluctuations in debt repayment patterns. Overall, Figure 1 highlights the complex interplay between the COVID-19 pandemic, household finances, and consumer behavior, with household debt repayments serving as a key indicator of economic resilience and financial well-being amidst unprecedented uncertainty.

Figure 2 presents the answers to the survey questions of the Office of National Statistics on wellbeing variables in Great Britain. The survey questions refer to life satisfaction, happiness, worthwhileness, and anxiety. There was a drop in wellbeing, both in terms of life satisfaction and happiness, during the first lockdown in spring 2020. This decline reflected the widespread disruption, uncertainty, and challenges brought about by the pandemic and associated lockdown measures. The negative impact on wellbeing underscores the significant psychological and emotional toll of the pandemic during its early stages. There was a continued negative trend until in January 2021. This sustained period of decline suggests persistent challenges and stressors affecting individuals' overall sense of satisfaction and happiness amidst ongoing uncertainty and disruptions to daily life. There appears to be a correction or improvement in wellbeing indicators after January 2021, signaling a potential shift in the trajectory of wellbeing trends. This improvement may reflect various factors, including the rollout of vaccination campaigns, easing of restrictions, and gradual recovery of economic and social activities, which may have contributed to a sense of optimism and hope among the population. Despite the observed correction in wellbeing indicators, it's noteworthy that they have not yet returned to pre-pandemic levels. This suggests that while there may be signs of

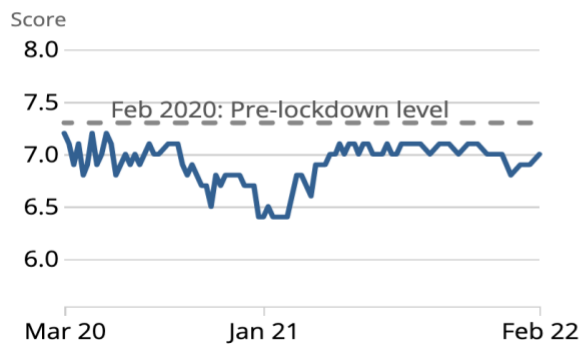
improvement, the overall wellbeing of individuals in the UK has not fully recovered from the adverse effects of the pandemic. Lingering concerns, ongoing challenges, and the long-term repercussions of the pandemic may continue to impact individuals' subjective wellbeing in the foreseeable future.

Figure 2 provides insights into the complex dynamics of subjective wellbeing in the UK amid the COVID-19 pandemic, highlighting both the resilience and vulnerabilities of individuals' mental and emotional health in the face of unprecedented challenges. The source of the data is Office of National Statistics (2022) that reports personal well-being in the UK: from March 2020 to February 2022.

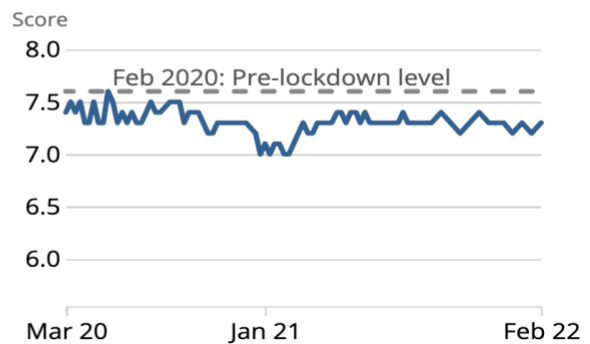
Figure 2: Wellbeing in Great Britain.

Adults in Great Britain, March 2020 to February 2022

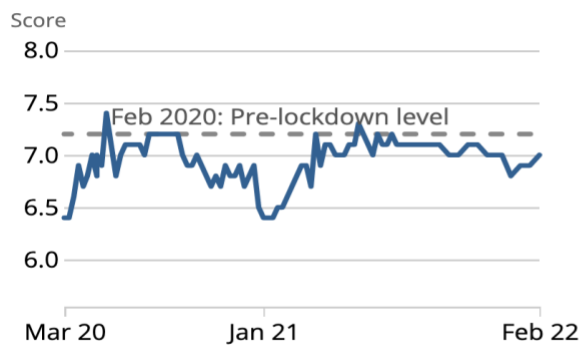
Overall, how **satisfied** are you with your life nowadays?



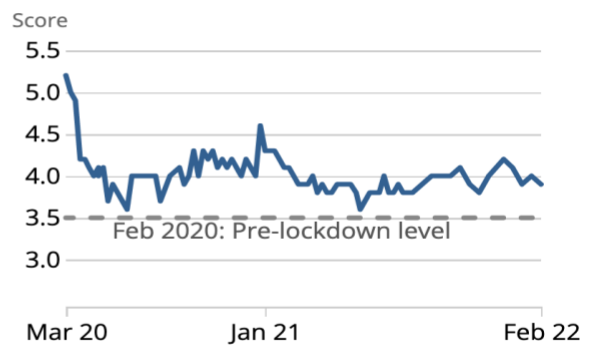
Overall, to what extent do you feel that the things you do in your life are **worthwhile**?



Overall, how **happy** did you feel yesterday?



Overall, how **anxious** did you feel yesterday?



Source: Office for National Statistics – Opinions and Lifestyle Survey

Regarding the exogenous variables, we consider government interventions in three main areas of interventions (from Hale et al. 2021): i) containment and closure, ii) health system, and iii) economic stimulus. The containment and closure interventions include: i) school closing, ii) workplace closing, iii) cancellation of public events, iv) restrictions on gatherings size, v) public transport closed, vi) stay at home requirements, vii) restrictions on internal movement, and viii) restrictions on international travel.

Table 1: Descriptive statistics of COVID-19 related data.

	Mean	Std. Dev	Min.	Max
<i>Endogenous Variables</i>				
Life Satisfaction	6.901	0.2078	6.4	7.2
Happiness	6.934	0.2275	6.4	7.4
Anxious	4.022	0.2656	3.6	5.2
Confirmed Cases (infections)	17305	323540	0	1.83E+07
Confirmed Deaths	36487	49725.7	0	15957
Total Repayments	18246	2892.2	13898	27851
<i>Exogenous Variables (government interventions)</i>				
Vaccination Policy	2.4331	2.2511	0	5
School Closing	1.4935	0.9952	0	3
Workplace Closing	1.8709	0.9473	0	3
Close Public Transport	0.7517	0.4320	0	1
Stay Home Requirements	0.6505	0.8107	0	2
International Restrictions	2.0492	1.1329	0	3
Stringency Index	55.368	23.0523	0	87.96
Income Support	1.4363	0.90388	0	2
Debt Contract Relief	1.6181	0.66335	0	2

Note: COVID-19 data, like infections and deaths, from Hale et al. (2021) are of daily frequency, and we convert to weekly for this study.

The health system interventions include: i) public information campaigns, ii) testing policy, and iii) contact tracing. The third area includes economic stimulus packages such as: income support, and debt or contract relief for households. The frequency of our data set is weekly, and in Table 1 we report descriptive statistics. The period is from the beginning of the pandemic January 2020 to February 2022; this results in 118 observations.

We also employ the overall Stringency Index by Hale et al. (2021) that provides a synthetic measure of the intensity of different non-medical government interventions during the pandemic. The scale of the Stringency Index by Hale typically ranges from 0 to 100. A higher value on the index indicates more stringent measures implemented by a government in response to the COVID-19 pandemic.

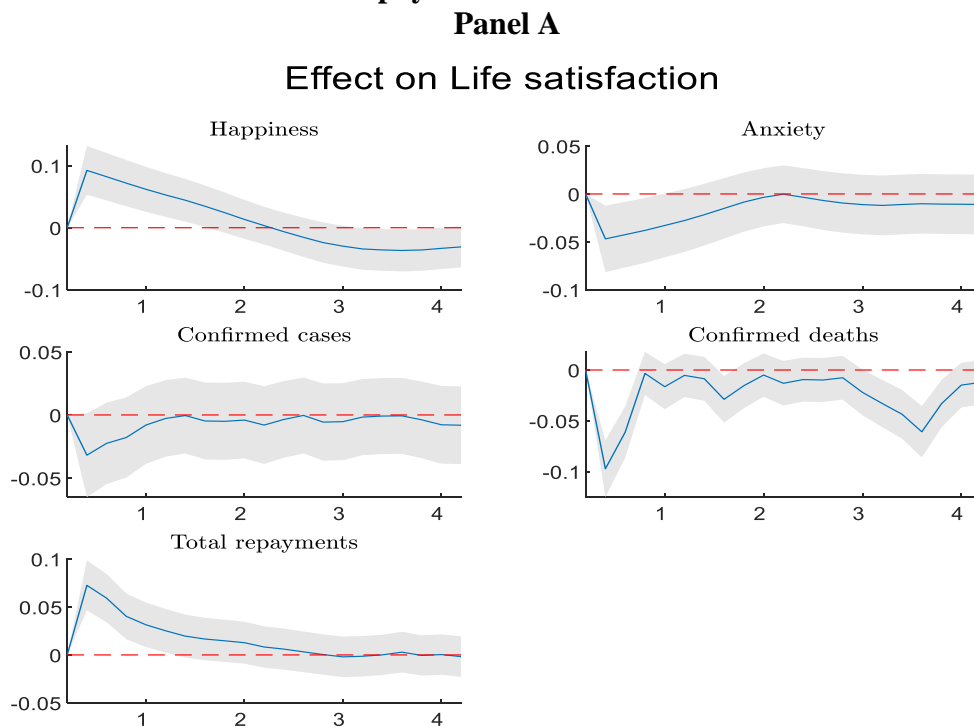
4. The dynamic copula VAR model

We estimate the stochastic volatility models of Equation (1) by extending Markov chain Monte Carlo (MCMC) as in Omori et al. (2007). In each MCMC algorithm, we use 25,000 draws and discard the first 5,000 draws as a burn-in. The cumulative distribution functions (CDFs) are not available in closed form but can be evaluated by simulation using the particle filter method. We compute the posterior means $\bar{\psi}_i$ and $\bar{u}_{it} = 1 - F(Y_{it} \leq y_{it} | y_{i,1:t-1}, \bar{\psi}_i)$ where $F(\cdot)$ denotes the CDF using 100,000 particles. In turn, we take $\bar{u}_t = (\bar{u}_{it}, i = 1, \dots, n)$ as data to estimate a skewed Student- t copula. Define $\bar{x}_{it} = \Phi^{-1}(\bar{u}_{it})$ and we test for normality using the Anderson-Darling statistic. Normality is found to hold. Additionally, as n is small we use the particle Metropolis–Hastings sampler, see Andrieu et al. (2010). All results are available on request but here we focus on reporting generalized impulse response functions (GIRFs) in the final week of the data.

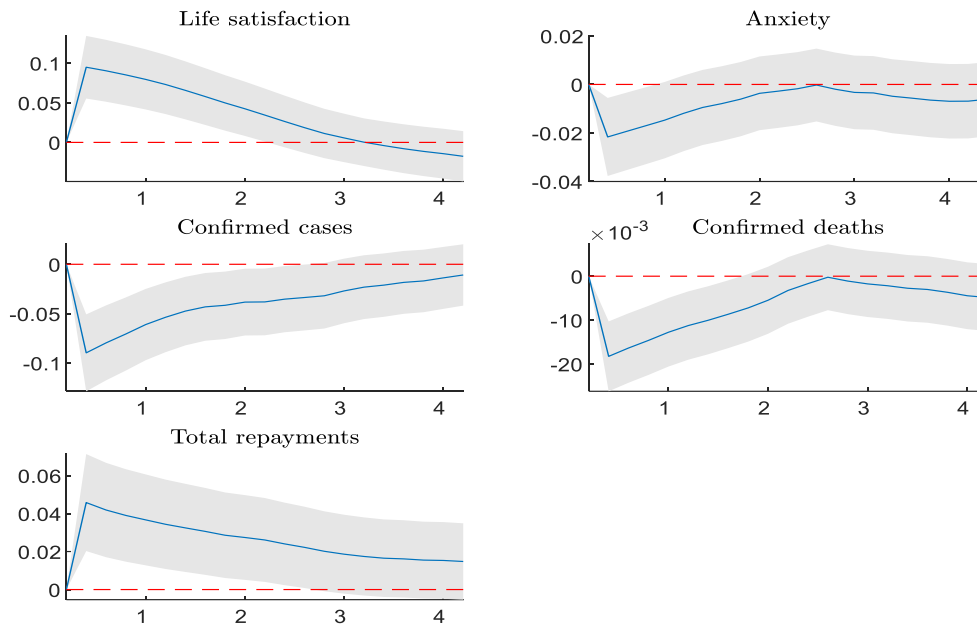
4.1 The Generalised Impulse Response Functions (GIRFs)

On the x-axis, we report months, and on the y-axis, we report GIRFs with 95% highest posterior density intervals. Figure 3 reports two sets of GIRFs: the effects on life satisfaction (top figures) and the effects on happiness (low figures). These effects show the responses of life satisfaction and happiness to shocks in confirmed cases, deaths, and total household debt repayments as well as anxiety. Clearly, COVID-19 shocks as measured by confirmed infection cases and deaths assert a negative impact on both happiness and life satisfaction. On the other hand, the effect of total debt repayments on both happiness and life satisfaction is positive. The impact of anxiety on happiness and life satisfaction is also negative and lasts for two months.

Figure 3: Response of life satisfaction, Panel A, (happiness, Panel B) in UK to shocks in debt repayments and COVID-19.



Panel B
Effect on Happiness



Source: Authors' estimations.

These results confirm the descriptive, survey-type, statistical analysis of OECD (2021) that argue that the pandemic could reduce happiness across OECD countries (see also Kelmara et al. 2021; Kleimeier et al. 2023). However, paying household debts improves happiness and life satisfaction during the pandemic. This finding of GIRFs aligns with economic and psychological research showing that financial burdens, particularly debt, are significant stressors that worsen anxiety (Kleimeier et al. 2023). By alleviating such financial obligations, individuals can experience a sense of relief and greater emotional stability, which contributes to improved well-being. This is particularly important in times of economic uncertainty, such as during a pandemic, where reducing debt can provide much-needed financial security, thus mitigating some of the negative psychological impacts.

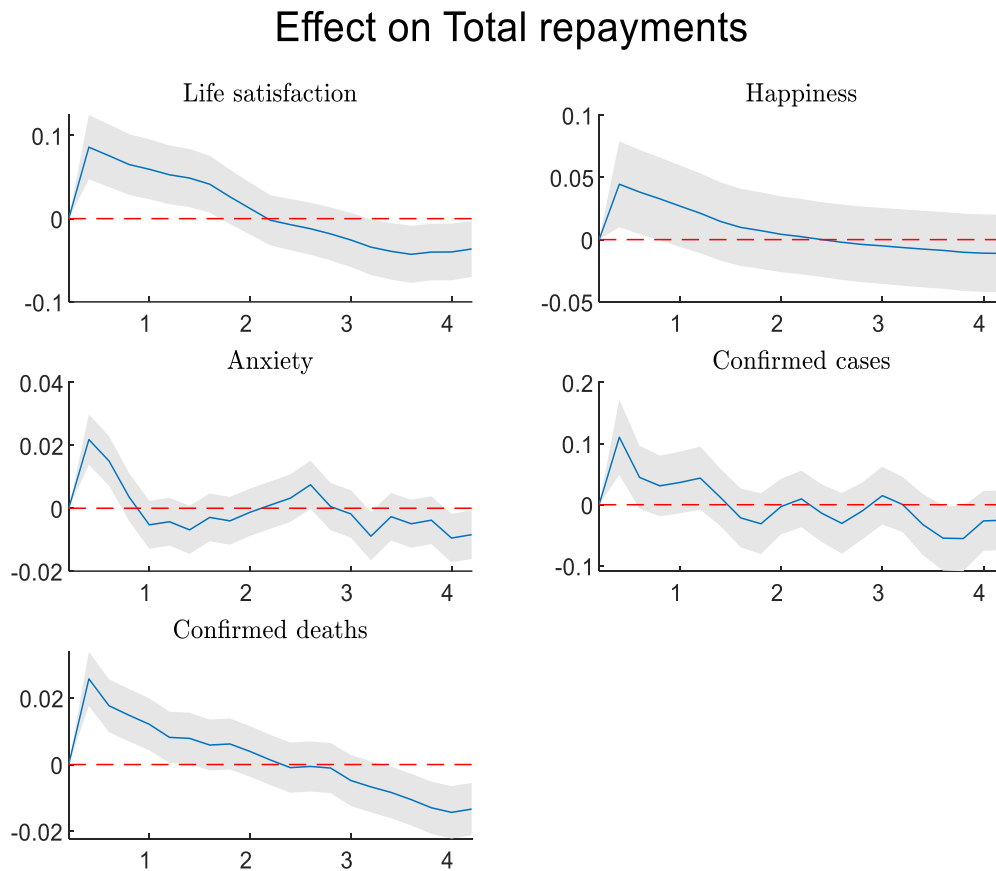
The findings presented in Figure 4 regarding the responses of household debt repayments to shocks in life satisfaction, happiness, anxiety, and COVID-19 variables provide valuable

insights into the dynamic interactions between subjective wellbeing and financial behaviour during the COVID-19 pandemic. Both life satisfaction and happiness unveil a positive impact on household debt repayments, with this effect lasting for two months. This suggests that higher levels of life satisfaction and happiness are associated with increased willingness or ability to prioritize debt repayment, reflecting a sense of financial stability and confidence. Anxiety also exerts a positive impact on debt repayments, albeit with a shorter duration and lower magnitude compared to life satisfaction and happiness. The shorter-lived effect of anxiety on debt repayments may reflect temporary responses to heightened financial concerns or stressors associated with anxiety. Both infections (confirmed cases) and deaths due to COVID-19 are associated with an increase in total debt repayments, although this effect lasts for less than a month.

It is interesting to note that our results point to a complex relationship between financial conduct, like paying your debt, and well-being, with short-term financial actions being triggered by negative emotions like anxiety and longer-term financial responsibility being led by positive emotions like happiness and life satisfaction. Furthermore, external negative shocks like the COVID-19 pandemic can exacerbate in the short run debt-reduction-focused financial behaviour.

The short-lived nature of the impact suggests that while COVID-19-related factors may influence debt repayment behaviour, their effects are transitory and may reflect immediate responses to changes in the pandemic's severity or perceived risks. The findings suggest the presence of feedback loops between subjective wellbeing (life satisfaction, happiness, anxiety) and household debt repayments, indicating bidirectional causal relationships between these variables. While happiness and life satisfaction exert a stronger and longer-lasting influence on debt repayments, anxiety also plays a role, albeit with a shorter duration and lower magnitude.

Figure 4: Response of total debt repayments in UK to shocks in life satisfaction, happiness, anxiety, and COVID-19 related variables.



Source: Authors' estimations.

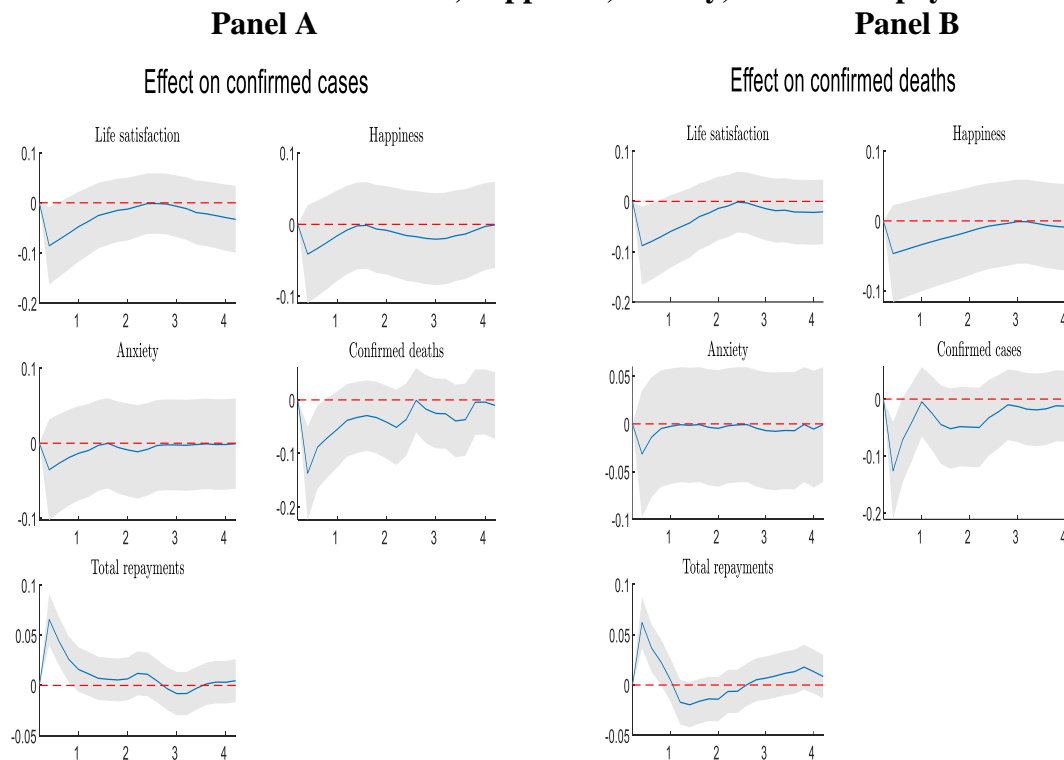
The dominant time-varying causal association in Table 2 is inferred to be from household debt repayments to subjective wellbeing (life satisfaction, happiness, anxiety). This suggests that changes in financial behaviours, such as debt repayment patterns, have a significant impact on individuals' subjective wellbeing, highlighting the importance of financial stability and management for mental and emotional health. These findings contribute to our understanding of the complex interplay between financial behaviour and subjective wellbeing during times of crisis, such as the COVID-19 pandemic, and underscore the importance of addressing both financial and psychological aspects of individuals' lives for promoting overall wellbeing and resilience.

The findings presented in Figure 5 regarding the responses of infections (confirmed cases) and deaths to shocks in life satisfaction, happiness, anxiety, and total household debt repayments provide valuable insights into the complex relationship between subjective wellbeing, financial behaviour, and the spread of COVID-19. Shocks in life satisfaction and happiness exert a negative impact on infections and deaths related to COVID-19. This finding is consistent with recent research by Krekel et al. (2023), which suggests that individuals with higher levels of happiness are more likely to adhere to preventive measures during lockdowns, thus contributing to a reduction in infections and deaths. The negative impact of life satisfaction and happiness on infections and deaths highlights the importance of psychological factors in shaping behaviours that mitigate the spread of the virus. The impact of anxiety on infections and deaths is negative but of low statistical significance. While anxiety may influence individuals' behaviours and perceptions related to COVID-19, its effect on the spread of the virus appears to be less pronounced compared to life satisfaction and happiness.

In more detail, the Findings in Figure 5 highlight that shocks in life satisfaction and happiness have a negative impact on infections and deaths related to COVID-19. This indicates that higher levels of happiness and life satisfaction contribute to behaviours that reduce the spread of the virus. The most important lesson to be learned from this is that psychological wellbeing, particularly pleasure and life satisfaction, is essential for encouraging health-conscious behaviour in times of crisis like the pandemic. On a larger social level, these feelings show how mental health can influence physical health outcomes by motivating people to take actions that safeguard both themselves and others. In contrast, while anxiety also has a negative impact on infections and deaths, the effect is less significant. Although anxiety may affect people's actions, such as increasing vigilance or worry about potential health hazards, its overall statistical influence on lowering infection rates is less noticeable. In contrast to enjoyment and

life satisfaction, which tend to sustain more favourable health behaviours over time, anxiety may not have the same long-lasting or consistent effects on behaviour, even while it may motivate short-term preventive efforts. This highlights how crucial good psychological states are in influencing public health outcomes, especially when there are widespread health hazards, such as the COVID-19 epidemic.

Figure 5: Response of confirmed cases (Panel A) and confirmed deaths (Panel B) in UK to shock in life satisfaction, happiness, anxiety, and total repayments.



Source: Authors' estimations.

Surprisingly, shocks in debt repayments increase infections and deaths related to COVID-19 in the very short run. This finding suggests that prioritizing household debt repayment may not directly contribute to efforts to combat the spread of the virus, at least in the short term. The increase in infections and deaths following shocks in debt repayments underscores the complex interplay between financial behaviours and public health outcomes during the pandemic.

Figure 5 provides evidence of the multifaceted relationship between subjective wellbeing, financial behaviour, and public health outcomes during the COVID-19 pandemic, emphasizing the need for integrated approaches that consider both psychological and economic factors in addressing the crisis.

Our model in Equation (1) also includes exogenous control variables that refer to government interventions. Table 2 reports the effects of these exogenous variables on happiness, infections, deaths, and total repayments from the Bayesian VAR. To facilitate the interpretation of the parameters all variables are in logs. To this end, the parameters show elasticities.

Remarkably all governments interventions whether these refer to lock down measures, such as workplace closing, pharmaceutical interventions, like vaccination policy, or other financial interventions, such as income support and debt contract relief, positively impact upon happiness and life satisfaction. The analysis reveals a positive association between the stringency index of COVID-19 preventive measures and happiness. Specifically, a 10% increase in the stringency index is associated with a 0.32% increase in happiness. While the effect size may not be large, the positive association is noteworthy and suggests that individuals may derive some level of satisfaction or wellbeing from the implementation of stricter preventive measures during the pandemic.

This finding is consistent with research (Krekel et al. 2023) showing that people were more likely to report higher levels of well-being when they thought that the measures were successful in lowering risk and protecting public health, even in the face of discomfort caused by lockdowns and other restrictions. Moreover, financial measures such as debt relief and income

support probably lessened worries about losing one's job or facing financial instability, which increased life happiness during the pandemic.

Building on insights from Krekel et al. (2023), which establish a positive link between happiness and compliance with COVID-19 preventive measures, the findings in Table 2 suggest a potential reciprocal relationship between these measures and happiness. Individuals who adhere to preventive measures may experience a sense of accomplishment or social cohesion, contributing to increased happiness. Conversely, the implementation of effective preventive measures may also lead to improved public health outcomes, which in turn could positively influence individuals' wellbeing and happiness.

Table 2: Effects of Exogenous Variables on Happiness, COVID-19 and Debt Repayments.

	Happiness	Life Satisfaction	Anxiety	Infections	Deaths	Total Repayments
Stringency Index	0.032*** (3.717)	0.005** (2.132)	0.012 (1.320)	-0.0035*** (3.470)	-0.051*** (2.818)	0.035*** (2.442)
Vaccination Policy	0.015*** (2.671)	0.0032 (1.788)	0.015 (0.552)	-0.0022*** (4.719)	-0.072*** (3.455)	0.082*** (2.655)
School Closing	0.071*** (2.552)	0.0044 (1.825)	-0.034 (1.505)	-0.015*** (2.851)	-0.055*** (2.913)	0.054** (2.165)
Work Place Closing	0.032 (0.015)	0.0031** (2.166)	-0.012 (1.673)	-0.047*** (2.780)	-0.177*** (2.941)	0.030*** (2.365)
Close Public Transport	0.005** (2.141)	0.004 (0.166)	0.005 (1.128)	-0.056 (3.781)	-0.059*** (2.621)	0.0071*** (3.793)
Stay at Home Requirements	0.002*** (2.772)	0.003 (1.232)	0.004*** (2.352)	-0.14*** (5.322)	-0.166*** (3.012)	0.055 (1.336)
International Travel Controls	0.0024*** (4.761)	0.001 (0.043)	0.035 (1.892)	-0.071*** (5.215)	-0.072*** (2.555)	-0.0052 (0.0820)
Income Support	0.056*** (3.782)	0.005 (0.717)	-0.025 (1.787)	0.045 (0.0321)	-0.033 (0.457)	0.235*** (5.882)
Debt Contract Relief	0.0015 (1.423)	0.002 (0.474)	-0.0044 (0.785)	0.017 (0.022)	0.0045 (0.775)	0.351*** (4.558)

Notes: Posterior z-statistics in parentheses (viz. posterior means divided by posterior standard deviations).

However, caution is warranted when interpreting the relationship between COVID-19 preventive measures and mental health outcomes, particularly in the context of lockdowns. Studies such as Adams-Prassi et al. (2022) demonstrate that lockdowns can adversely impact mental health, especially among specific demographic groups such as women. The findings in Table 2 also indicate that stay-at-home restrictions may heighten anxiety, aligning with previous research. Further research across countries is needed to comprehensively understand these interlinkages and assess the nuanced effects of preventive measures on mental health outcomes.

Thus, lockdowns and extended limitations can cause social isolation, decreased mobility, and financial difficulty, all of which have a detrimental impact on mental health, even though preventive actions might promote a sense of security and wellbeing. This intricate relationship implies that whereas preventative actions can occasionally increase happiness, they can also result in mental health issues that need to be carefully managed. In summary, there is a reciprocal association between happiness and COVID-19 prevention strategies. Although compliance and positive emotions are mutually reinforcing, authorities should combine public health initiatives with tactics to reduce adverse mental health consequences, particularly during extended limitations.

5. Conclusion

The paper enquires into the impact of rising household debt repayments during the initial COVID-19 lockdowns on life satisfaction in the UK, shedding light on the intricate relationship between financial behaviours, subjective wellbeing, and public health outcomes. The findings reveal that an uptick in household debt repayments could potentially bolster happiness among individuals. This discovery underscores the pivotal role of financial stability and management in influencing subjective wellbeing, indicating that reduced debt burdens may lead to heightened happiness and overall life satisfaction.

Higher levels of happiness appear to serve as a protective factor against COVID-19 infections, suggesting that positive emotions and attitudes may influence behaviors that reduce the spread of the virus. Lockdown measures are associated with increased happiness and life satisfaction, possibly due to factors such as enhanced family time and a newfound appreciation for a slower pace of life. However, these measures also contribute to heightened anxiety, highlighting the trade-offs between public health interventions and individual mental wellbeing. Income support and debt relief initiatives lead to higher household debt repayments, offering immediate financial relief but raising concerns about long-term financial stability and subjective wellbeing.

Our findings underscore the intricate dynamics of the COVID-19 pandemic's impact on wellbeing. Policymakers can leverage this understanding to design tailored interventions that effectively support individuals and communities navigating the challenges posed by the pandemic and its aftermath. It is crucial for policymakers to strike a balance between curbing the spread of the virus and addressing potential adverse effects on mental wellbeing. This may entail implementing targeted support initiatives for vulnerable groups and promoting resilience-building strategies within communities. Moving forward, further research should continue to explore the multifaceted interactions between preventive measures, mental health outcomes, and subjective wellbeing across diverse populations and settings. Such research efforts will be invaluable in informing evidence-based policy responses and interventions.

Data availability statement and conflict of interest statement

The data that support the findings of this study are available in Hale, et al. (2021) “A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)” *Nature Human Behaviour* at <https://doi.org/10.1038/s41562-021-01079-8>. Also, the study uses data from Bank of England, Money, and Credit Statistics, May (2020), at <https://www.bankofengland.co.uk/statistics/money-and-credit/2020/may-2020>. Lastly, the study employs data from Office of National Statistics (2022) “Personal well-being in the UK: April 2020 to March 2022” at <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/bulletins/measuringnationalwellbeing/april2022tomarch2023>.

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