Quantifying Mental Health[†]

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March 2025

PRELIMINARY

Abstract

We document the global rise of mental health risk over the past decade using medical data from 26 advanced economies, as well as text data from major news outlets in 39 countries, quarterly earnings calls of U.S. listed firms, and U.S. congressional hearings. To understand the consequences of this broad trend, we incorporate uninsured idiosyncratic mental health risk into a workhorse macroeconomic model with incomplete markets. Individuals can enter a negative mental health state, such as depression or anxiety, which we formalize as the sudden onset of hyperbolic discounting in the spirit of Harris and Laibson (2001). Individuals with ill mental health fail to internalize the general-equilibrium effects of overspending on aggregate savings. As a result, the rise in ill mental health is characterized by low demand, a compressed wealth distribution, and elevated interest rates. Policies such as targeted disability benefits and preferential saving rates can boost demand. However, if financed with labor income taxes, the multiplier from these government expenditures is small.

[†]We thank Giancarlo Corsetti, Zhen Huo, Matan Mazor, and Kurt Mitman for useful feedback. Jamilov acknowledges funding by the John Fell Fund (CUD00490). First draft: March, 2025.

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1 Introduction

In 2019, nearly a billion people lived with a mental disorder, and suicide accounted for more than 1 in 100 deaths worldwide (WHO, 2022). Stigmas against individuals with mental health conditions are prevalent in many societies, suggesting that even these recorded numbers greatly underestimate the true share of people suffering from mental ill-health. Despite the high societal and medical importance of mental health, there is surprisingly little academic work on its macroeconomic implications. This is unexpected as mental health has first-order impacts on rationality (McGorry et al., 2024) and, consequently, on consumption and saving decisions, as well as productivity. In this paper, we attempt to fill this gap. We measure mental health risk with new data and a develop a structural economic model to quantify its general-equilibrium consequences.

We begin by systematically measuring mental ill-health using newly compiled medical data from the Global Burden of Disease (GBD) and national sources for 26 advanced economies. Our analysis shows that, on average, approximately 20% of the population has been diagnosed with a mental health condition. This figure has risen significantly over the past decade, particularly in the U.S. and the U.K. The prevalence of mental ill-health is especially high among individuals aged 10 to 24, indicating a likely continuation of this trend in the short to medium term.

In the labor market, mental health status is strongly associated with employment outcomes. In the United States, employment rates are negatively correlated with the severity of mental health conditions. Individuals identified as having "serious" mental ill-health have employment rates close to 50% lower than those with "good mental health", whose employment rate exceeds 75%. In the United Kingdom, poor mental health is consistently ranked among the main causes of work absences.

A significant concern in the mental health debate is its financial strain on government budgets. The growing prevalence of mental health conditions has driven up public spending on related social programs, such as disability benefits, while also increasing the tax burden on the working population. Real government spending on mental health services grew by 37.5% in the U.S. and 52.1% in the U.K. between 2017 and 2024. By 2024, mental health expenditures made up 3.4% of total government spending in the U.S. and 1.5% in the U.K. These rising costs are substantial and are expected to increase further in the coming years. Implementing effective mental health policies can have significant socio-economic benefits, but their funding and potential labor market distortions create a trade-off that requires a general-equilibrium analysis to evaluate.

While analyzing medical data is crucial, one limitation of this approach is the low

frequency and slow pace of updates. An alternative, more real-time approach involves using text as data (Gentzkow et al., 2019). Various textual sources—such as news outlets and political or commercial discussions—contain valuable information on risk factors, which can be extracted using natural language processing techniques. Text-based measures typically offer higher frequency updates and can be attributed to different economic agents, making them a useful proxy for tracking mental health trends.

We construct a novel news-based measure of mental health risk using textual analysis tools and data on 67 major news outlets from 39 countries, including such outlets as CNN, The Guardian, Fox News, and The Economist. The share of all worldwide news transcripts that discus mental health has gone up significantly over the past decade, with an exponential rise during the Covid-19 pandemic years, pointing to the exacerbated negative effects of the loneliness epidemic. The geography of mental health risk reveals that the trend is driven primarily by the advanced economies such as U.S., Canada, and the U.K., with a close correlation over the sample-period with the medical health data.

The largest share of news articles with mental health related discussions is in the United States. The share was around 6% in 2023 and just below 2% in 2013, suggesting a close to four-fold increase in mental health coverage and awareness. To better understand this stark finding, we document outlet-specific measures of mental health risk for the five major U.S. media outlets: CNN, ABC, Washington Post, New York Times, and Fox News. The result is highly robust across the outlets, suggesting that it is not driven by social or political preferences of any particular institution.

Does mental health also receive attention from "Wall Street" and "Capitol Hill"? We now measure mental health risk exposure in transcripts of quarterly earnings calls of U.S. listed firms as well as U.S. congressional hearings. First, the fraction of earnings calls that discuss mental health has risen considerably over the past 7 years with a global peak around the Covid-19 pandemic. Second, there is a three-fold rise in the share of congressional hearings that discuss mental health over the past decade. While the pattern is similar across the two bodies of the U.S. Congress (House and Senate), the rise is starker in the case of the House due to a lower base effect.

Overall, our empirical analysis paints a compelling picture—there is a global rise in mental health risk, as evidenced by medical data, major international newspapers, discussions among firms and politicians, as well as fiscal figures and forecasts. To understand the implications of this trend, we embed mental health risk into a workhorse macroeconomic model with capital accumulation, incomplete markets, and uninsured idiosyncratic income risk. Our framework centers on temporary, within-individual deviations from rationality formalized as sudden onsets of hyperbolic discounting and over-weighting of

the present. A significant body of work in psychology has documented that excessive discounting is a common feature of many of the most common mental health problems—from depression to anxiety, anhedonia, PTSD, impulsivity, ADHD, and OCD. Indeed, through this lens, addiction is also commonly viewed as another mental health issue (e.g., MacKillop et al., 2011).

Our main quantitative exercise involves simulating the empirically observed rise in the share of individuals with ill mental health. Hyperbolic discounters under-weight future income and do not internalize the general-equilibrium effects of private over-spending on aggregate wealth and the real interest rate. As a result, as the share of agents with poor mental health increases, the distributions of wealth and consumption compress and every agent in the economy becomes worse off.

What can the government do to offset the mental health crisis? We consider two alternative programmes that aim to improve on the market outcome with quantity or price based regulations. We show that policies such as targeted disability benefits and preferential saving rates can alleviate the macroeconomic detriments of rising ill-mental health. Both instruments begin to raise equilibrium wealth and consumption as demand goes up. However, when either policy is funded by labor income taxes, the burden on the working taxpayer becomes significant. As a result, the net impact on the economy is ambiguous and the multipliers from these expenditures are small.

Literature. Our paper contributes to the theoretical literature on hyperbolic discounting and the influential $(\beta - \delta)$ class of economic models (Laibson, 1997; Harris and Laibson, 2001, 2002, 2012; Krusell and Smith, 2003; Cao and Werning, 2018; Laibson and Maxted, 2023; Maxted et al., 2024; Maxted, 2025). We embed mental health risk, represented as a sudden and temporary onset of extreme discounting, into the standard macroeconomic model of household heterogeneity (Bewley, 1977; Huggett, 1993; Aiyagari, 1994). We particularly emphasize *mental* health as opposed to *physical* health (De Nardi et al., 2024).

The paper that is thematically closest to ours is Abramson et al. (2024), who develop a macroeconomic model of depression. The advantage of our framework is that it builds upon a general feature of ill mental health that is common across a variety of illnesses as shown extensively in the psychology literature (Demurie et al., 2012; Johnson et al., 2014; Keidel et al., 2024; Amlung et al., 2017; Hu et al., 2024; Verfaellie et al., 2024, among others).

Empirically, we use standard natural language processing methods, specifically keyword counting tools that were used in, among many others, Baker et al. (2016), Hassan et al. (2019), and Jamilov et al. (2024).

2 Data and empirical analysis

2.1 Medical data

The state of global mental health is difficult to measure due to variations in definitions, cultural stigmas, and symptoms associated with mental health, making it challenging to assess mental illness across countries (e.g., McGorry et al., 2024). To date, the most comprehensive dataset on global mental health is provided by the Global Burden of Disease (GBD) database from the Institute for Health Metrics and Evaluation (IHME).

Figure 1a presents estimates of the prevalence rate—the proportion of the population affected by mental illness—across all OECD economies. In these economies, mental illness is defined as having a clinical diagnosis for one of the more than 50 recognized mental health conditions listed in the International Classification of Diseases. The figure provides these estimates for 2013 and the most recent available year (predominantly 2021). As shown in the figure, global mental health has deteriorated over time. In 2013, fewer than 15% of the population had a clinically diagnosed mental health condition. By 2021, this share had risen to over 20% in most countries. Notably, several Anglo-Saxon economies (e.g., the U.S., the U.K., and Australia) have experienced larger-than-average increases in the prevalence of mental illness.

Clearly, the estimates in Figure 1a underestimate the long-run rise in mental health risks. As is commonly known, mental health eventually becomes fairly constant with age, exhibiting more variation only among the younger part of the population (e.g., McGorry et al., 2024). Figure 1b provides the prevalence rate for the same set of countries but for the 10-24 year old subset of the population. Compared to the overall population, worryingly, both the level and the increase over time are substantially more dramatic. In several countries, more than 30% of the 10-24 year olds suffer from ill-mental health. Indeed, in the U.K., this increase has been so large as to warrant a "mental-health crisis" task force (McGorry et al., 2024). All else equal, Figures 1a and 1b suggest that the worsening of overall mental health is likely to continue going forward.

Mental health in the U.K. The mental health challenge is a particularly intensely debated issue in the U.K. As can be seen from Figure 2, according to the NHS, the number of people diagnosed with either clinical depression or ADHD in the U.K. has been rising steadily over the past decade. As of 2024, there were almost 10 million individuals diagnosed with either of the two illnesses. Some policymakers have voiced concerns that mental health conditions are over-diagnosed.[1] Others have stipulated that the stigma associated with

[1] See, for example, this BBC article.

mental wellness has eroded over time, freeing up more people to seek medical advice and treatment now than in the past. The root cause of the ongoing mental health crisis, whether in the U.K. or worldwide, remain incompletely understood.

2.2 Mental health and the labor market

Although important, age is, however, not the only source of heterogeneity. Panel (a) in Figure 3 shows employment rates as a function of mental health in the U.S. using data from Luciano and Meara (2015). Unsurprisingly, as mental health worsens, employment rates fall. But the decline is, nevertheless, striking: people that are scored to have a "stable" mental health have employment rates close to 80%; yet, people who only have "moderately" stable mental health have employment rates substantially closer to 60%. All else equal, this suggests large extensive margin (labor supply) effects from variations in mental health. Panel (b) in Figure 3, instead, focuses on the intensive margin using data from ONS (2022). It shows that, in the U.K. around 10% of absences from work are due to "poor mental health".

2.3 Fiscal implications

A critical aspect of the ongoing mental health debate is pressure on the government budget. The rising prevalence of mental health conditions increases fiscal spending on the associated social programs (such as disability benefits) and, indirectly, the tax burden on the working population. Table 1 shows that government expenditure on mental health related causes has increased, in real terms, by 37.5% in the US and 52.1% in the UK over 2017-2024. As of 2024, mental health expenses, as a share of total government spending, amounted to 3.4% in the US and 1.5%. These numbers are large and are very likely to grow in the future.

The algebra above suggests that implementing the right policies to address the mental health crisis can have significant fiscal and macroeconomic implications. Moreover, how these policies are funded is crucial. The trade-off for the government is clear: addressing mental ill-health can yield a double dividend of greater private wealth accumulation and consumption. However, any social program introduces moral hazard-like frictions that may distort labor market allocations and, in the worst case, cancel out the intended policy effects. Determining which arm of the trade-off dominates is a quantitative question that requires a general-equilibrium model incorporating both supply and demand. We revisit this issue when we introduce our model in Section 3.

2.4 News outlets

To complement our empirical analysis using medical data, we now proceed by measuring mental health risk with text. First, the news data comes from the Factiva database, which provides access to digitized international news sources. Our first dataset is an annual panel covering 39 advanced and emerging economies from 2013 to 2023.[2] This dataset comprises 67 major nationwide media outlets, including leading newspapers and TV networks from these countries. If there are multiple sources per country, we will take the within-country-year average of exposures.

To quantify news-based mental health risk, we employ simple tools from computational linguistics. Specifically, we conduct full-text searches for the keyword "mental health" in news outlets of countries where English is the dominant language. For all other countries, we search for equivalent keywords in the local language. For each country and year, we compute the total number of articles that mention "mental health" at least once. Finally, we measure exposure to mental health risk as the ratio of mental health-related news articles to the total number of news articles published each year.

Our second dataset includes quarterly news data from five major nationwide news outlets in the United States: ABC, CNN, Fox News, The New York Times, and The Washington Post. For each outlet, we extract the publication date and time, news source, title, and byline of all news articles. We then apply free-text searches to identify news articles containing the term "mental health" and measure mental health risk by calculating the quarterly share of news articles discussing mental health.

Global results. To analyze the international trend in news-based mental health risk, we construct a global mental health index using a size-weighted average of country-level mental health risk. Each country's contribution to the global index is also weighted by its GDP. These data are from the World Bank's World Development Indicators database and are valued in constant 2015 United States dollars.

Figure 4 presents the GDP-weighted and unweighted global mental health index from 2013 to 2023, based on news coverage from 67 national media outlets across 39 countries. The index shows a general upward trend, with a significant surge beginning in 2019 and peaking in 2022. The rise suggests a significant global shift in media attention to mental health, particularly in the developed countries. This trend highlights the growing

[2]The advanced economies include Austria, Australia, Belgium, Canada, Finland, France, Germany, Italy, Japan, Norway, Portugal, Spain, Switzerland, the United Kingdom, and the United States. Emerging market economies include Argentina, Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Saudi Arabia, South Africa, South Korea, Thailand, Tunisia, Turkey, Ukraine, and Venezuela.

coverage of mental health in international media over time.

To identify which countries have contributed to the rise in news coverage the most, we analyze trends at the country level. Figure 5 shows changes in news-based mental health risk for each country within four regional groups: America, Europe, Middle East and Africa, and Asia and Oceania. Across all regions, there is a clear upward trend in media attention to mental health, particularly after 2017. In America, U.S. shows the most significant increase, particularly from 2018 onward, followed by Canada. In Europe, the UK experiences a sharp rise in coverage, peaking in 2021, while Germany and Spain also display steady growth. The trends in the the Middle East and Africa are more moderate, with South Africa and Israel leading the rise. Finally, in Asia and Oceania, Australia exhibits the steepest rise, particularly in 2019 and 2020. These patterns indicate a growing media focus on mental health globally, with regional variations in the intensity and timing of increased coverage. The intensity of the rising awareness about mental health seems to be concentrated in the developed countries.

Finally, Figure 6 compares the news-based mental health risk measure across countries as a snapshot in just two years: 2013 and 2023. The U.S. shows the most significant increase, reaching a level of media attention of 6% in 2023. In other words, 6% of all news articles and programs discuss mental health related issues at least once. Australia, the UK, Canada, and Portugal also exhibit substantial growth numbers. While most countries follow an upward trend, some, such as Saudi Arabia and Russia, show minimal to no change.

U.S. results. We now analyze news-based mental health risk in the United States. Figure 7 reports the mental health risk measure at quarterly frequency from 2013 to 2023 for three major U.S. television networks (CNN, ABC, and Fox News) and two newspapers (The New York Times and The Washington Post). We observe a persistent, roughly three-fold increase in the measure over the past decade with additional acceleration since around 2018. The trend is highly robust across the five major outlets, suggesting that the result is not driven by social or political preferences of any one particular outlet.

Our mental health risk exposure measure reached its historical high during the COVID-19 pandemic. This reflects the increasing public and policy focus on mental health challenges (the loneliness epidemic) exacerbated by the pandemic and the ensuing lockdowns. However, observe that the trends did not revert to normality after the effects of the Pandemic subsided, suggesting that the mental health crisis is likely here to stay.

The Economist. To complement the news-based analysis above, we now compute a similar measure of mental health risk for The Economist magazine, which is a leading "global" as opposed to national news and information outlet. Using the universe of The Economist's articles over 2010-2020, we calculate the yearly share of all articles that mention "mental health" at least once.

Figure 9a presents the result. Consistently with our prior findings for the major U.S. and international newspapers, there has been a steady increase in mental health awareness and coverage in The Economist. As of 2020, that share was at its global peak level of around 1.1%, likely influenced by the pandemic.

2.5 Quarterly earnings calls

Does mental health risk get covered by firms? To address this question, we obtain transcripts of quarterly earnings calls of U.S. listed firms from LSEG. For each transcript over 2013-2023, we run the similar word counting algorithm and compute the share of all calls, in each year, that mention "mental health" at least once.

Figure 9b shows the result. From virtually no discussions in 2016, the fraction of calls that mention mental health has risen to around 1.5% in just 7 years. The global peak of this trend was around 1.7% around the Covid-19 pandemic. The share has declined somewhat since then and was 1.3% as of the end of 2023. Overall, this finding shows that mental health is more prevalent in the discussions of firm managers and financial analysts.

2.6 U.S. Congress hearings

We now measure mental health related discussions in the texts of U.S. congressional hearings. The data is obtained from Congress.gov, a publicly available resource. Our sample includes approximately 5,815 Senate hearing transcripts and 10,729 House hearing transcripts from the 111th to the 118th Congress. The time span is from 2009-q1 to 2024-q4. We restrict our analysis to non-trivial hearings with at least 100 words. For each transcript, we conduct a keyword search for the bigram "mental health" and compute the share of total transcripts, in each quarter, that mention "mental health" at least once.

Figure 8 reports results for the two bodies of the federal government. We observe a steady, roughly three-fold, rise in the share of congressional hearings that discuss mental health over the past decade. While the pattern is similar across the two bodies, the rise is starker in the case of the House due to a lower base effect. This result shows that mental health, at least in passing, is starting to receive more attention from U.S. policy-makers.

In summary, we have documented a robust, persistent, upward trend in mental health risk using numerous data sources. There is a three-fold global rise in mental health coverage of media outlets of 39 countries. The issue is not isolated to the "main street" as mental health risk is being increasingly more prevalent on both "Wall Street"—as evidenced from the earnings calls of listed firms—and "Capitol Hill"—as seen from the texts of U.S. congressional hearings. The rise in mental health awareness or coverage is grounded in fundamentals as seen in actual medical data on rising mental health diagnoses and prescriptions around the world. Many of our measures peaked around the Covid-19 pandemic, suggesting the amplifying force from the ongoing loneliness epidemic. The measures have not, however, reverted back to normality, implying instead that the mental health crisis is a permanent shock affecting the global economy.

To understand the potential aggregate implications of our empirical findings, we now integrate mental health risk into a standard macroeconomic model with incomplete markets and employment risk.

3 A model of mental health risk

Time is discrete. The environment consists of heterogeneous households, a representative firm, and a government that maintains a balanced budget. There is no aggregate uncertainty.

3.1 Preferences

There is a unit mass of infinitely-lived households $j \in [0,1]$ who derive utility from consumption, are subject to uninsured idiosyncratic employment risk, and can save in a non zero-net-supply asset. Each agent is endowed with one unit of time, which yields $\epsilon\tilde{l}$ units of the labor input. There are two possible labor market states. The agent is either employed, in which case $\epsilon = 1$, or unemployed, in which case $\epsilon = u$ and u is unemployment insurance that is funded by the employed through a proportional labor income tax τ.

In addition, each agent is in either a "regular" or "depressed" mental health state, denoted by s. We refer to these two states, for ease of interpretation, as δ and $\beta\delta$ agents. δ agents discount the future exponentially with a subjective discount factor $\delta \geq 0$. $\beta\delta$ agents, on the other hand, discount the future following a quasi-hyperbolic discount function à la Laibson (1997) $\{1, \beta\delta, \beta\delta^2, \beta\delta^3, \dots\}$ with $\beta \in [0,1]$. For values $\beta = 1$, our setup nests the standard model with only exponential discounters. For any $\beta < 1$, a fraction of the agents

will underweight the future. Preferences for the δ agent at time t can be written as follows: $\mathbb{E}_t\Big[u(c_t)+\sum_{k=1}^{\infty}\delta^k u(c_{t+k})\Big]$. Preferences for the $\beta\delta$ agent at time t are: $\mathbb{E}_t\Big[u(c_t)+\beta\sum_{k=1}^{\infty}\delta^k u(c_{t+k})\Big]$.

The exogenous change of *employment* state follows a Markov process: $\pi_\epsilon(\epsilon'|\epsilon)$. The exogenous change of *mental* state follows a Markov process that is conditional on the employment state: $\pi_s(s'|s,\epsilon)$. In other words, low mental health state is more likely in the unemployed state. The share of the employed in the economy is always fixed at λ and the share of the $\beta\delta$ agents is ω. Both shares are uniquely pinned down by $\{\pi_\epsilon, \pi_s\}$.

3.2 Technology

Markets are incomplete and there is only asset—capital—which we denote by k. Capital holdings must satisfy $k \in \mathcal{K} \equiv [-\phi, \infty]$ where ϕ is a borrowing limit. Denote with K and L the total amounts of capital and labor supplied in the economy, respectively. Production is constant-returns-to-scale and competitive factor prices are determined as follows: $w(K,L) = (1-\alpha)\left(\frac{K}{L}\right)^{\alpha}$ and $r(K,L) = \alpha\left(\frac{K}{L}\right)^{\alpha-1} - \delta_k$ where δ_k is the rate of depreciation.

3.3 Equilibrium

We now lay out the recursive competitive equilibrium of our economy. Denote with Γ the measure of agents over employment status, mental health status, and asset holdings. Let H denote the law of motion of the distribution: $\Gamma' = H(\Gamma)$. The parts of this law of motion that concern ϵ and s are exogenous as determined by the transition matrices. The problem of the household in recursive formulation is as follows:

$$\begin{aligned} v_s(k,\epsilon,s;\Gamma) = \max_{\{c\geq 0, k'\}} \Big\{ & u(c) + \pi_s(s'=\beta\delta|s,\epsilon)\beta\delta \sum_{\epsilon'} \pi_\epsilon(\epsilon'|\epsilon) v_{\beta\delta}(k',\epsilon',s';\Gamma') \\ & + \pi_s(s'=\delta|s,\epsilon)\delta \sum_{\epsilon'} \pi_\epsilon(\epsilon'|\epsilon) v_{\delta}(k',\epsilon',s';\Gamma') \Big\} \end{aligned} \tag{1}$$

subject to:

$$\begin{aligned} & c + k' = k\Big(1 + r(\Gamma)\Big) + \epsilon w(\Gamma)(1-\tau) + (1-\epsilon)u \\ & \Gamma' = H(\Gamma) \\ & k' \geq -\phi \end{aligned} \tag{2}$$

The labor market clears such that aggregate labor supply equates demand: $L = 1 - \lambda$. The government's budget balance is: $\tau = \frac{1-\lambda}{\lambda}u$. Aggregate capital is determined as follows: $K'(\Gamma') = K\Big(H(\Gamma)\Big) = \int f_s(k,\epsilon,s;\Gamma)d\Gamma$ with f_s being the decision rule for the updating of capital

for the agent with mental health status s.

A recursive competitive equilibrium is defined by the law of motion Γ, the pairs of functions v_s and f_s, and pricing functions $\{r, w\}$ such that: (a) (v_s, f_s) solve the dynamic problem of the household; (b) r and w are determined competitively; (c) Γ is generated by f and all markets clear. Henceforth, we will be studying the *stationary* competitive equilibrium of this economy, which is characterized by the time-variant distribution of agents $\tilde{\Gamma}$ induced by $\{\pi_s, \pi_\epsilon\}$ and f such that all aggregate quantities and prices are time-invariant.

4 Quantitative analysis

4.1 Calibration

We calibrate the mental health block of our model to match some of our empirical results. In particular, the transition probabilities π_s are parameterized such that, conditional on being in the depressed state today, the probability of remaining in the depressed state is 50% if employed and slightly greater if unemployed. Conditional on being in the regular mental state today, the probability of remaining in that state is calibrated to target the empirically observed shares of individuals with negative mental health status—an object that corresponds to $1 - \omega$ in our economy. We consider two scenarios: the *low* and *high* depression economies that feature the ergodic shares of $\beta\delta$ consumers, $1 - \omega$, of 10% and 25%, respectively. These values correspond to our medical data, specifically to the fraction of individuals worldwide and particularly in the U.S. that are either diagnosed with or self-report to have mental ailments such as ADHD, PTSD, or clinical depression.

The remaining parameters are standard. The subjective discount factor δ is 0.99. The size of short-run subjective discounting, β, is set at 0.7 following Laibson (1997), among others. The concavity of the production function, α, is set at 0.36. Period utility function is CRRA with risk aversion $\sigma = 1$. The depreciation rate δ_k is set to 0.025. Unemployment benefits u are parsimoniously set at 25% of wage income. Finally, the transition matrix for employment risk, π_ϵ, is calibrated to generate the ergodic share of the unemployed of 5%. We solve the model non-linearly with standard numerical methods.

4.2 The impact of rising mental health risk

Our main quantitative exercise is to simulate the rise in mental health risk that we document in the data. To this end, we solve for the stationary equilibrium of the model

under two calibration strategies, as mentioned above: for low and high ergodic shares of hyperbolic discounters.

Figure 10 presents the stationary distributions of wealth and consumption in high- and low-depression economies. We observe that the *level* of both aggregate spending and capital accumulation shifts leftward as the share of ill mental health individuals increases. Furthermore, the *distribution* of wealth compresses and inequality falls.

What is the economic mechanism behind this result? Consider the individual-level decision making process. Conditional on being in a negative mental health state, the hyperbolic disounter over-values the present and underweights future realizations of income. In partial equilibrium, the agent therefore allocates more of their wealth on consumption. In general equilibrium, however, the decisions of these agents that pursue instantaneous gratification backfire as aggregate demand for capital falls, which compresses production. In this regard, the behavior of the $(\beta - \delta)$ agents is "irrational".

Are all agents in the economy strictly worse off as the share of $(\beta-\delta)$ consumers goes up? Figure 11 shows that all four consumer "types"—employed and regular, employed and depressed, unemployed and regular, and unemployed and depressed—are considerably less wealthy in the high-depression calibration due to the effects of over-spending on capital accumulation.

4.3 Discussion

In our framework, ill mental health causes households to irrationally devalue outcomes whose realization is delayed; it causes households to engage in "excessive temporal" $(\beta - \delta)$ discounting. A large body of work in psychology has documented that such excessive discounting is a common feature of many of the most common mental health problems—from depression to anxiety, anhedonia, PTSD, impulsivity, ADHD, and OCD (Demurie et al., 2012; Johnson et al., 2014; Keidel et al., 2024; Amlung et al., 2017; Hu et al., 2024; Verfaellie et al., 2024, among others). Indeed, through this lens, addiction is also commonly viewed as another mental health issue (e.g., MacKillop et al., 2011).

Our model contrasts with the model of ill mental health recently proposed by Abramson et al. (2024), where episodes of poor mental health are modeled using methods from the robust control literature (e.g., Hansen and Sargent, 2008; Ilut and Schneider, 2014). Unlike their framework, which is taillored to speak to the rise of depression as a condition (Section 2), our model captures a common feature of multiple mental illnesses. Clearly, one could combine the depression-specific channels highlighted in their work with those that we outline below. Nevertheless, we view one advantage of our framework is that it builds upon of a feature of ill mental health that is common across a whole variety

of ilnnesses. This is especially important with mental health, as the precise diagnosis of mental health issues is far from accurate (e.g., Al-Huthail, 2008).

Although our model captures a common consequence of many, common mental health problems—excessive discounting—it is, ultimately, silent on the underlying driver behind the trend documented in Section 2. Partly, the reason for this choice is that the root cause is at present much in debate. In a recent overview, "The Lancet Psychiatry Commission" listed rising inequality, social media, lonliness, insecure employment, and climate change as potential root causes (McGorry et al., 2024). Instead of analyzing any one of these, we, in the above, choose to be silent on the underlying driver and instead analyze the macroeconomic consequences of the rise in ill mental health.

Finally, dynamically inconsistent preferences like $(\beta - \delta)$ discount functions used in this paper are often modeled and solved as intra-personal games. Backward induction solutions of these games typically generate the so-called consumption pathologies: policy functions that are highly sensitive to model calibration due to the implicit ability of the present self to determine state variables for the subsequent selves (see, for example, the discussion in Krusell and Smith (2003) or Cao and Werning (2018)).

We argue that in our paper this is not an issue for several reasons reasons. First, Harris and Laibson (2002) show that consumption pathologies do not arise when parameters are calibrated empirically. Second, instability is more likely at lower frequencies, such as annual, while the period in our model is a quarter (Maxted, 2025). Third, we have solved our model for various starting conditions and the solution converges consistently to the same stationary steady state. Fourth, much of the debate on the stability of hyperbolic discount functions involves representative-agent models while the issue is much less clear for heterogeneous-agent models like ours. And, finally, we present the policy functions for consumption as implied by the stationary equilibrium of the model with the high-depression calibration. As can be seen from Figure 12, the policy functions are highly stable for the unemployed and the employed as well as for the exponential and the hyperbolic discounters.

5 Policies to address the mental health crisis

What can the government do to address the rise of mental health risk? In this section, we study two of the most heavily discussed policy instruments through the lenses of our quantitative framework. First, the market outcome is corrected through quantity-based regulation: targeted mental-health disability benefits. The idea is to stimulate demand by injecting government-funded cash into the population that is affected by extreme

hyperbolic discounting. Mental-health benefit schemes are currently implemented in the majority of countries worldwide. Second, the market outcome is altered through price-based regulation: the saving rate is allowed to be higher for ill-mental health agents. In other words, the government funds a premium on savings to encourage the hyperbolic discounters to forgo consumption and to spend more at the more favorable rates. In both scenarios, we stress the fiscal cost implications of these tools.

5.1 Disability benefits

One solution to combat the mental health epidemic is to provide targeted transfers to the affected population. In theory, these transfers at least partially translate into wealth accumulation even if the ill-mental health agent has a high MPC. Let the cash disability benefit, d, be defined in terms of a share of average labor income. Also, let s now stand for an indicator variable that takes the value of unity if the agent's discount factor is $\beta\delta$ and zero otherwise. The budget constraint for the household is now:

$$c + k' = k\Big(1 + r(\Gamma)\Big) + \epsilon w(\Gamma)(1-\tau) + (1-\epsilon)u + sw(\Gamma)d \tag{3}$$

Thus, agents with poor mental health can apply and receive cash benefits, d. We assume that the mental health state is perfectly verifiable. We also assume that benefits, d, are funded by a balanced-budget government scheme via labor income taxation. Let τ_d be the part of the income tax that finances disability spending. Then, $\tau_d = \frac{\omega}{\lambda}$. The burden on fiscal space to finance benefits is increasing with the share of the population that is of ill mental health and decreasing with the employment ratio. The portion of the labor income tax that finances unemployment benefits is unchanged at $\tau_u = \frac{1-\lambda}{\lambda}u$. The total labor income tax is now comprised of two components—funding of unemployment benefits and mental-health disability benefits—and equals: $\tau = \tau_u + \tau_u$. Clearly, this tax scheme could be in principle implemented via lump-sum transfers. However, this is normally considered to be infeasible in practice.

Figure 13 shows the result from introducing mental-health disability benefits that amount to 20% of the average labor income. The left tails of the distributions of both wealth and consumption shift rightward. The policy achieves its goal by boosting savings and spending of the most vulnerable agents in the economy. However, as can be also seen from the graphs, the right tails of the distribution compress leftward. The financing burden of disability benefits falls on the employed, who are now less wealthy and consume less because of the distortionary effects of a greater labor income tax. The net impact on the macroeconomy is generally ambiguous and depends on calibration.

The above observation is at the heart of the ongoing public finance debates on mental health expenditures in the U.K., U.S., and elsewhere. The rising prevalence of mental health ailments leads to greater public spending. How that spending is financed matters greatly and presents a non-trivial trade-off for policymakers.

5.2 Preferential saving rates

The issue in the market arrangement with a high share of ill-mental health agents is that the equilibrium savings rate is not high enough for the agent to switch from consumption to capital accumulation. One remedy is to target the saving rate directly by offering a premium, or a spread, on the market rate. Suppose that the government offers $r^H > r$ to anyone who identifies—and is correctly verified—as having ill mental health. The new balance sheet constraint for the household reads:

$$c + k' = k\Big(1 + sr^H(\Gamma) + (1-s)r(\Gamma)\Big) + \epsilon w(\Gamma)(1-\tau) + (1-\epsilon)u \tag{4}$$

where recall that s is now an indicator variable that takes on the value of unity if the discount factor is $\beta\delta$ and 0 otherwise. Thus, while exponential discounters save at $r(\Gamma)$, hyperbolic discounters save at $r^H(\Gamma)$. The tax that fully finances the spread, $r^H - r$, is: $\tau_s = \frac{\omega}{\lambda}(r^H - r)k_{s=\beta\delta}$, where $k_{s=\beta\delta}$ are capital holdings of the ill-mental health agents regardless of employment status. Intuitively, the fiscal burden of this social program is increasing in the share of ill-mental health individuals, decreasing in the share of the employed, and increasing in the desired interest rate spread and capital holdings of the target group. The total labor income tax is now comprised of two components—funding of unemployment benefits and differential saving rates—and equals: $\tau = \tau_u + \tau_s$. The tax rate is fully endogenous because capital holdings are a choice variable and are determined in equilibrium.

Figure 14 shows the result from introducing a preferential saving rate scheme with a target spread of 4%. The policy equilibrium features greater wealth and consumption for the agents in the left tails of the distributions. As such, the policy achieves its objective of boosting demand. However, as in the case with disability benefits, wealth and consumption of the employed do not rise and, if anything, marginally fall. The macroeconomic impact of this instrument is small and its net effect on aggregate welfare is ambiguous. Considering that the 4% spread, and the associated fiscal burden, are large, the multiplier of this fiscal program is small.

6 Conclusion

Since 2013, the World Health Organization (WHO) has implemented a comprehensive global action plan for mental health, outlining clear actions for Member States, the WHO Secretariat, and international, regional, and national partners. The plan aims to promote mental health and well-being for all, prevent mental health conditions among at-risk populations, and achieve universal coverage for mental health services (WHO, 2021). While medical attention to mental health has increased and psychology research continues to advance in understanding its causes, the economic—and particularly macroeconomic—implications of mental health disorders remain poorly understood.

Two major challenges in this area are measurement and quantification, which are the key issues this paper addresses. We construct comprehensive measures of global mental health risk using newly assembled data from international medical records and various textual sources. Our empirical analysis documents a clear, robust, and persistent rise in the proportion of individuals experiencing some form of mental health ailment. Additionally, we observe a significant increase in media coverage and awareness of mental health issues across 39 countries, as reflected in major news outlets, quarterly earnings calls of publicly listed U.S. firms, and U.S. Congressional hearings.

To examine the macroeconomic implications of this trend, we introduce mental health risk—modeled as the sudden onset of hyperbolic discounting—into a canonical macroeconomic framework with income risk and incomplete markets. Our model demonstrates that rising mental health risk can have profound aggregate and distributional effects, and that the fiscal expenditures associated with the rise in ill-mental health can pose fiscal risks. A promising avenue for future research is the integration of commitment mechanisms into our framework, allowing individuals with compulsive tendencies toward immediate gratification to pre-commit to self-control plans, potentially leading to welfare-improving outcomes.

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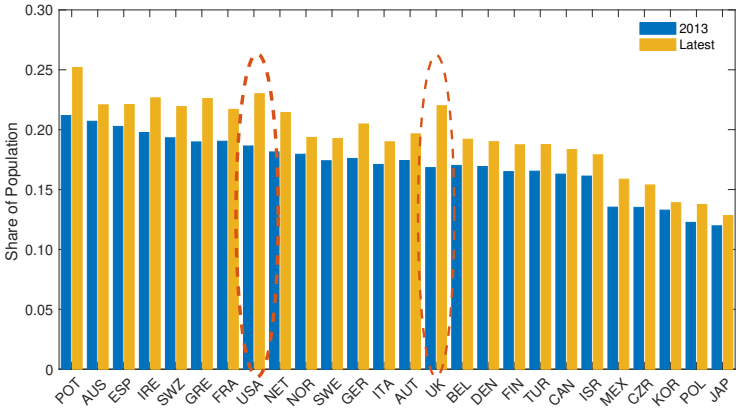
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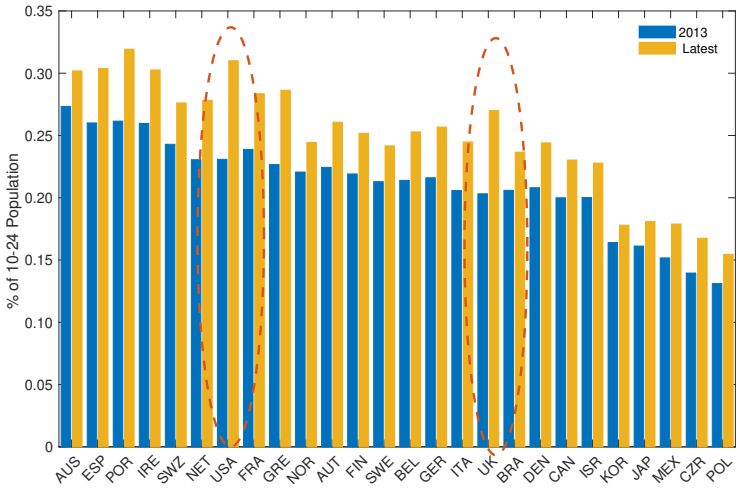
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Figures and Tables

Figure 1: The State of Global Mental Health



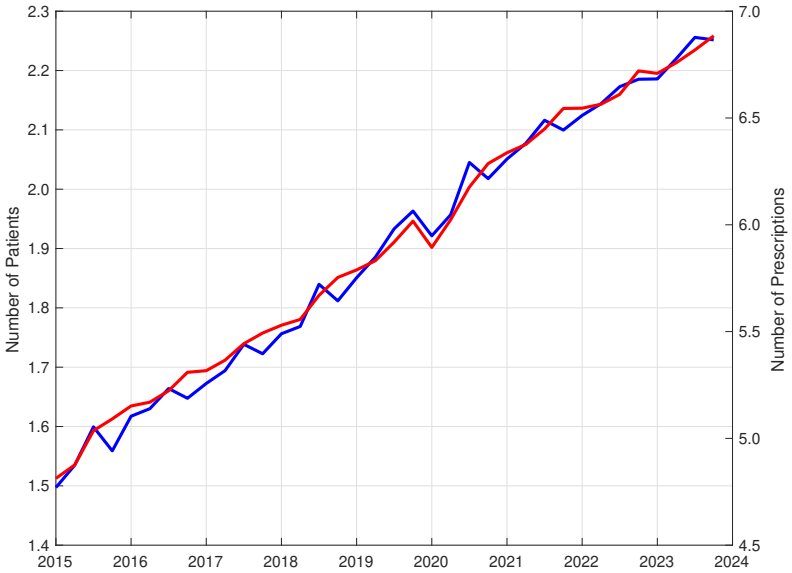
(a) Whole Population



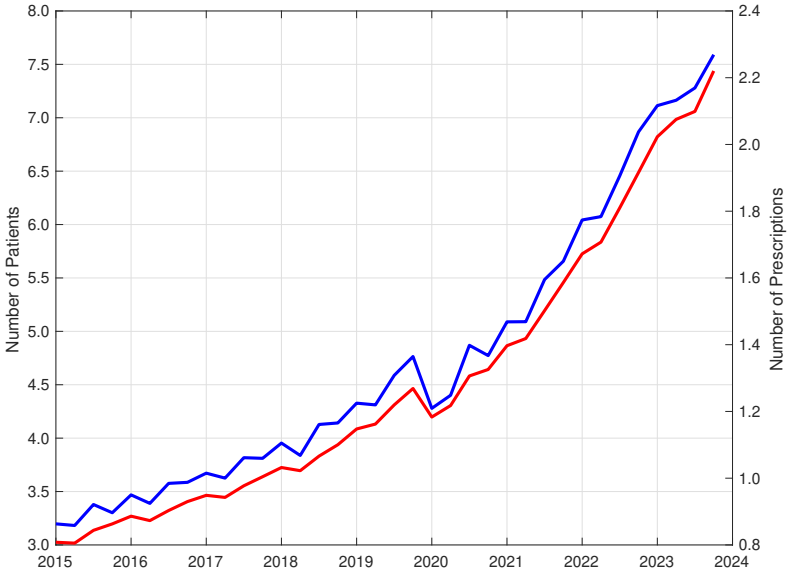
(b) 10-24 Year Old Population

Notes: Data from the GBD 2025 Database by IHME

Figure 2: Mental Health in the UK



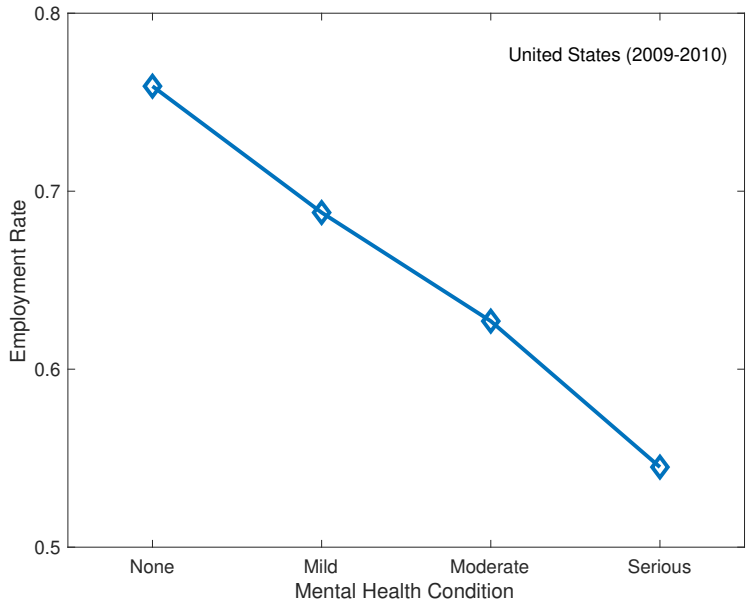
(a) Depression



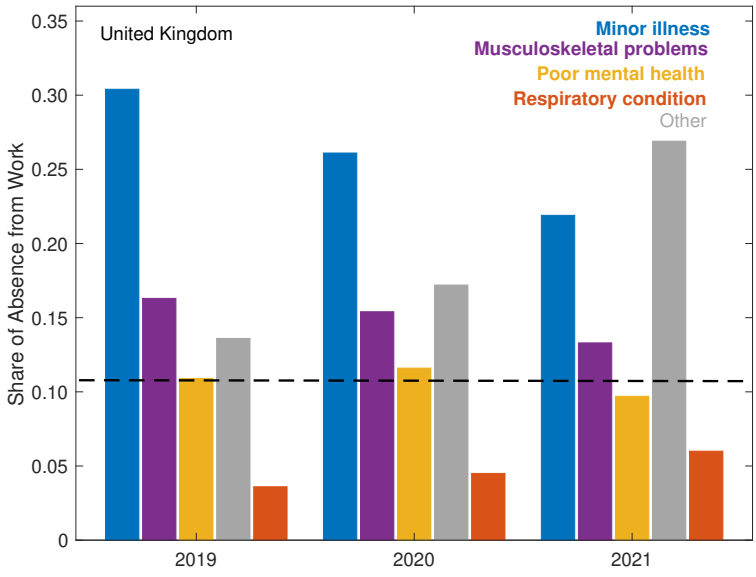
(b) ADHD

Notes: Both panels rely on data from the NHS. In both panels, blue lines belong to the left y-axis, while the red lines belong to the right y-axis. All numbers are in millions (i.e., 2.0 corresponds to $2.0 \cdot 10^6$)

Figure 3: Mental Health and Employment



Panel (a): Extensive Margin



Panel (b): Intensive Margin

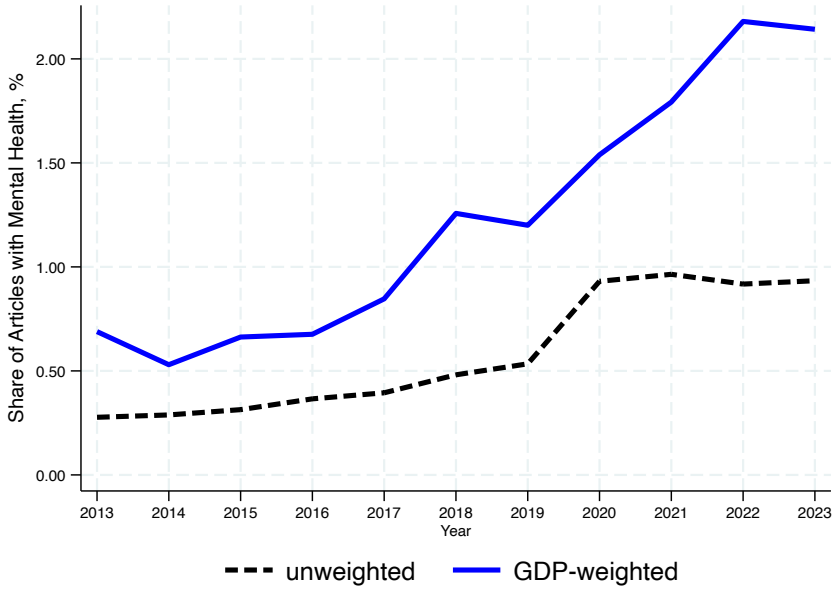
Notes: Panel (a) uses data from Luciano and Meara (2015), while Panel (b) uses data from ONS (2022).

Table 1: The Fiscal Burden of Mental Health Expenditures (in %)

	US	UK
Real spending increase (2017-24)	37.5	52.1
Gov. expenditure share (2024)	3.4	1.5

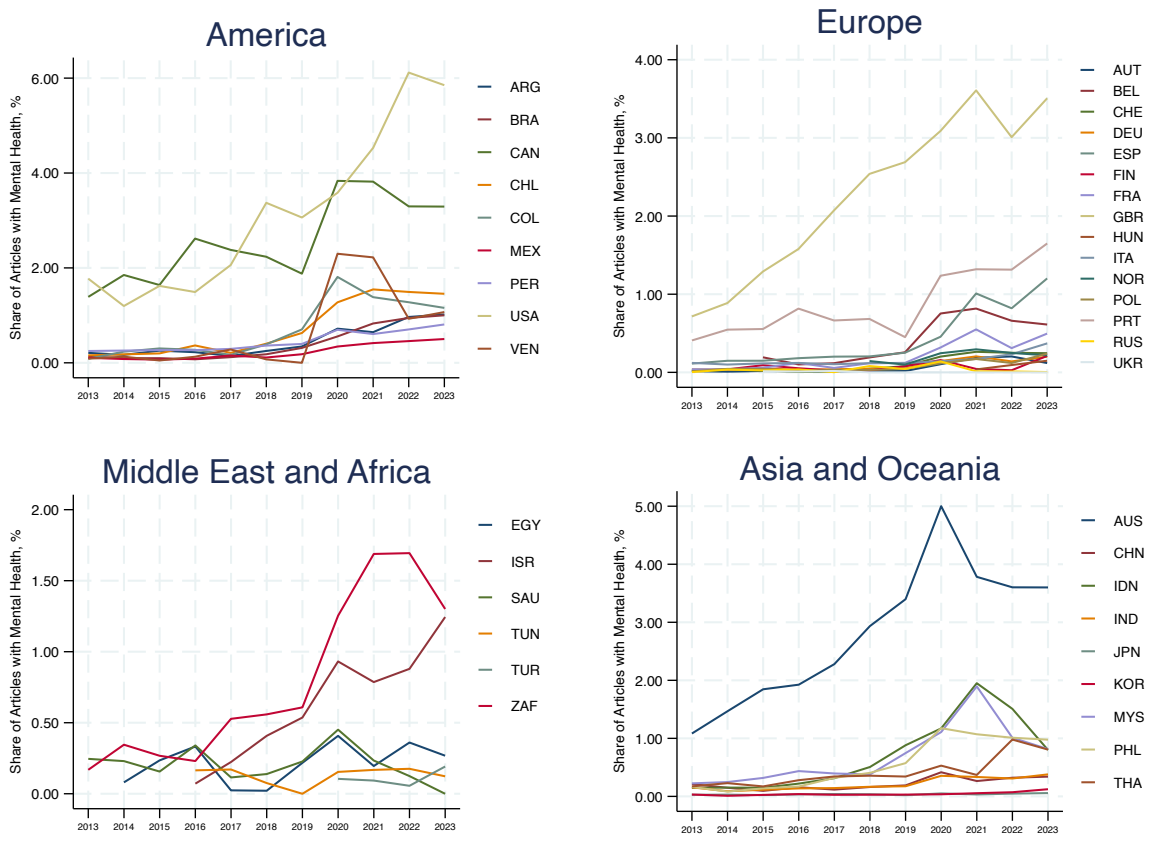
Notes: The estimates for the US are from SAMHSA survey and the Congressional Budget Office, while the estimates for the UK are from the NHS Mental Health Dashboard and Office for Budget Responsibility.

Figure 4: Global News-Based Mental Health Risk



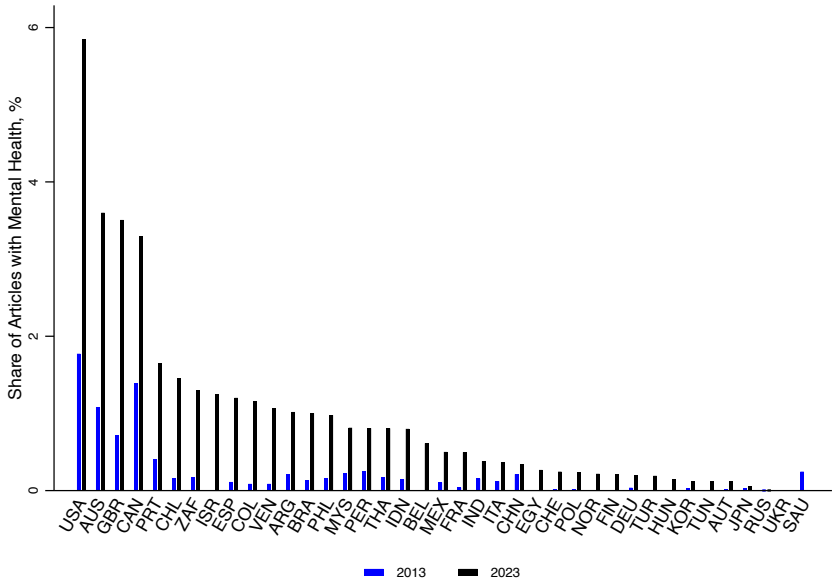
Notes: Unweighted and GDP-weighted average of national shares of articles that discuss mental health. Data comes from Factiva.

Figure 5: The Geography of News-Based Mental Health Risk



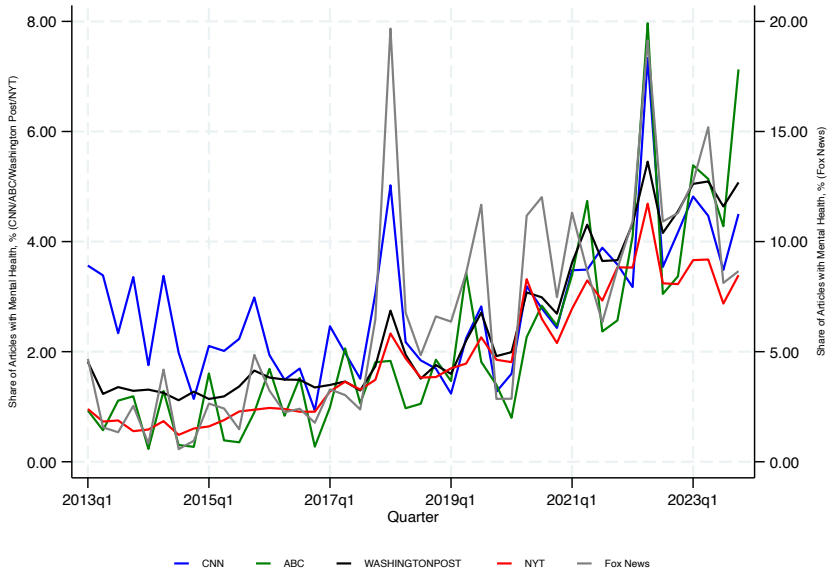
Notes: Time-series of shares of national articles that mention mental health. Data comes from Factiva.

Figure 6: The Geography of News-Based Mental Health Risk



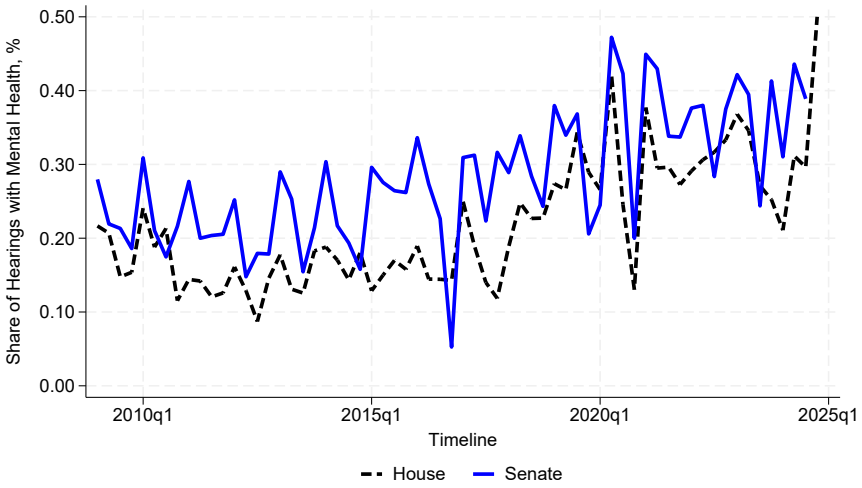
Notes: Snapshot of national shares of national articles that mention mental health in 2013 and 2023. Data comes from Factiva.

Figure 7: News-Based Mental Health Risk in the United States



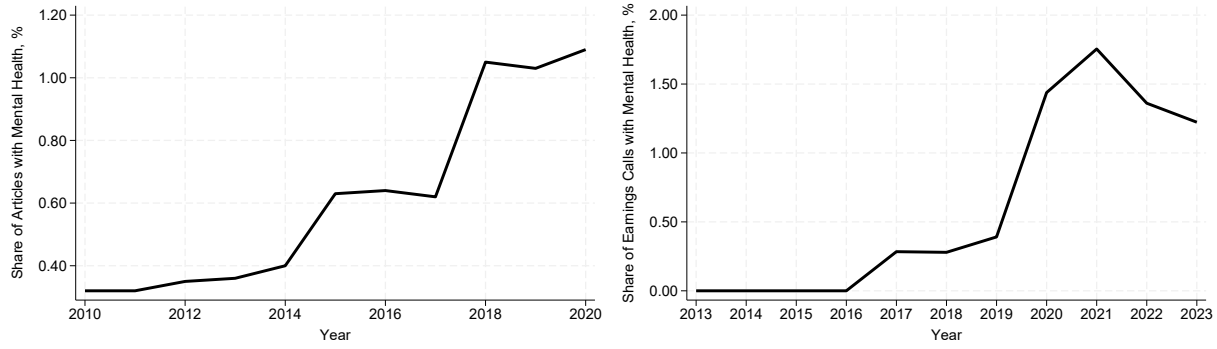
Notes: Time-series of shares of articles from five major U.S. news outlets that mention mental health. Data comes from Factiva.

Figure 8: Mental Health Risk in U.S. Congressional Hearings



Notes: Time-series of shares of U.S. congressional hearings that mention mental health. The data is from Congress.gov.

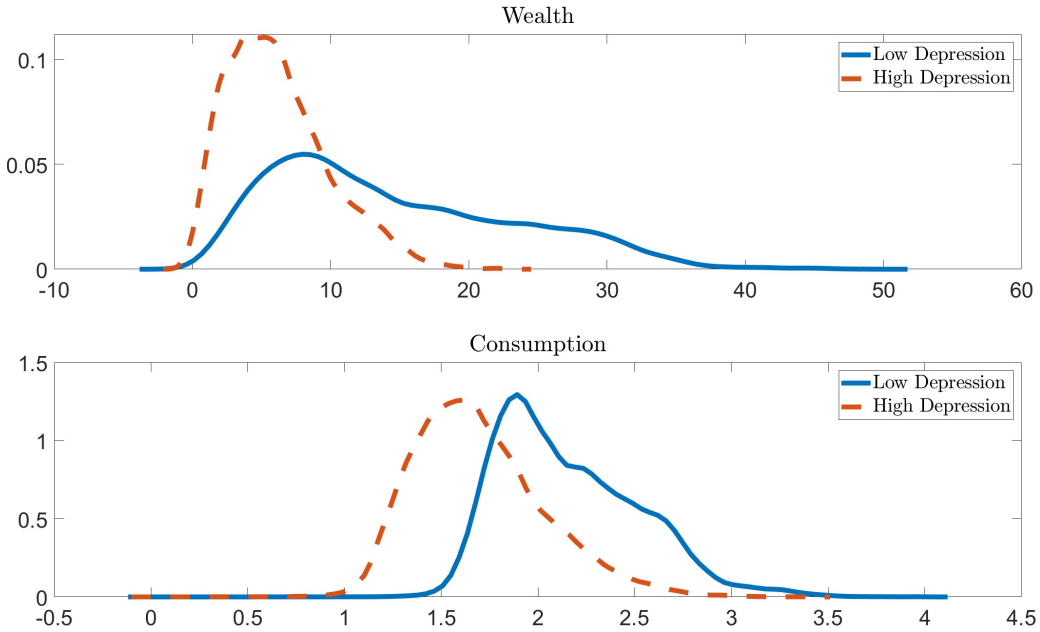
Figure 9: Mental Health Risk in Other Text Sources



(a) The Economist **(b)** U.S. Earnings Calls

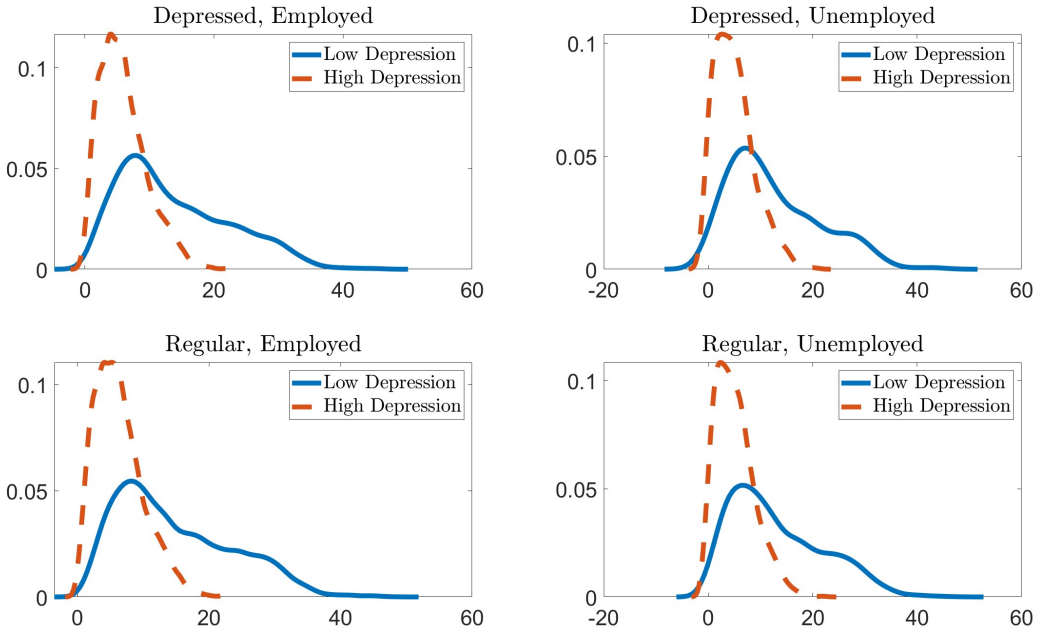
Notes: Panel (a) plots the time-series of shares of articles from The Economist maganize that mention mental health. Data comes from The Economist's digital archive, accessed via the Gale Digital Scholar Lab. Panel (b) plots the time-series of shares of transcripts from quarterly earnings calls of U.S. listed firms that mention mental health. Data is from LSEG.

Figure 10: Model Distributions of Wealth and Spending



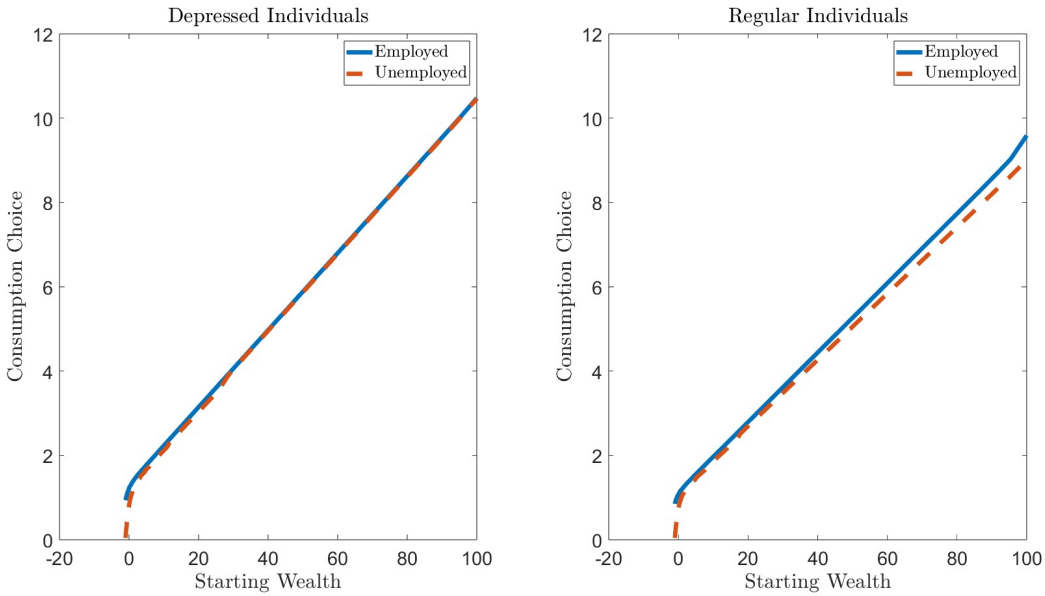
Notes: Distributions of wealth (top panel) and consumption (bottom panel) from the stationary equilibrium of the model under the high- and low-depression calibrations.

Figure 11: Model Distributions of Wealth by Agent Type



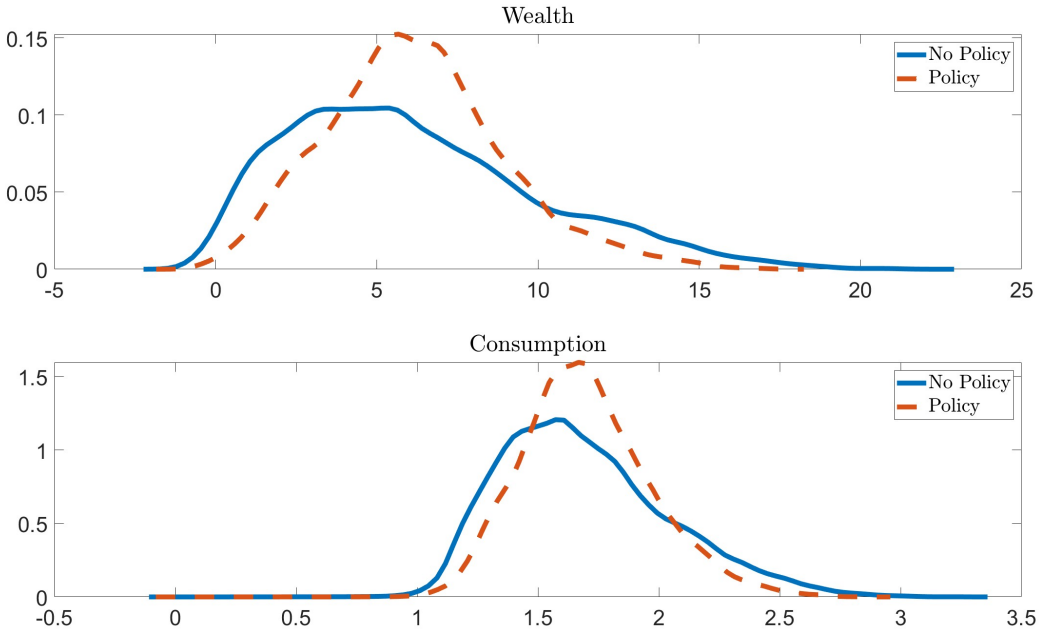
Notes: Distributions of wealth by employment and mental health type from the stationary equilibrium of the model under the high- and low-depression calibrations.

Figure 12: Model Consumption Policy Functions by Agent Type



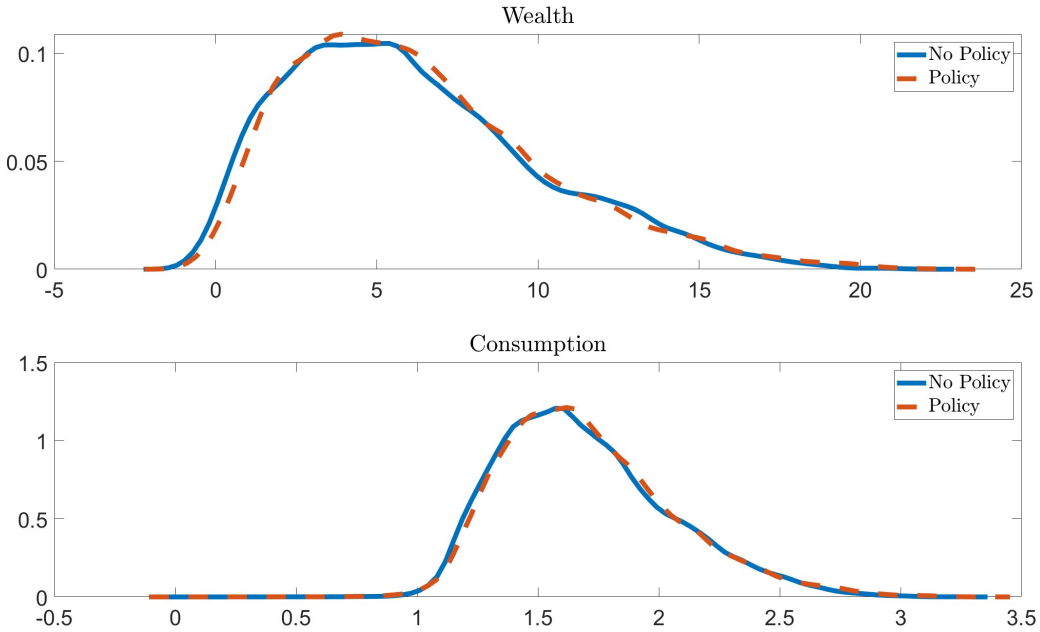
Notes: Consumption policy functions for the employed and unemployed as well as good and poor mental health households in the high-depression calibration of the stationary equilibrium of the model.

Figure 13: The Impact of Mental-Health Disability Benefits



Notes: Distributions of wealth (top panel) and consumption (bottom panel) from the stationary equilibria of the model with and without disability benefits for low-mental health agents.

Figure 14: The Impact of Preferential Saving Rates



Notes: Distributions of wealth (top panel) and consumption (bottom panel) from the stationary equilibria of the model with and without preferential saving rates for low-mental health agents.