Institute and Faculty of Actuaries

COVID-19

COVID-19 and pandemic response unemployment Model

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This report is produced by a Health and Care workstream of ICAT (IFoA Covid-19 Action Taskforce)

27 August 2020

Abstract

COVID-19 is causing a severe economic recession in the United Kingdom (UK) due to unprecedented government interventions to control the virus that was declared a pandemic on 11 March 2020 (source: WHO). The response to the pandemic includes interventions like a national lockdown causing turmoil to the UK economy. The uncertainty in economic conditions is expected to continue, illustrated by a wide range of expert views on unemployment, in the short through to medium/long term, including views from: the Office of Budget Responsibility (OBR); the Bank of England (BoE); and other forecasters [1] [2].

Actuaries will have to make difficult judgement calls on future forecasts of unemployment when considering the impact on Income Protection (Group and Individual business) or Private Medical Insurance (PMI) business given the correlation between unemployment and health/wellbeing.

This bulletin focuses on UK unemployment forecasts where the working group have provided an application using R-Shiny to enable actuaries to consider a range of expert opinions and functionality to create custom scenarios. The code for this is open access.

We aim to create discussion within the profession regarding the impact of unemployment on population health and wellbeing, and the subsequent claims implications.

This bulletin is the first in a series of related topics that will be published shortly including:

- Population health management (PHM)
- Economic hardship, health and COVID-19
- Unemployment and impact on Income Protection and PMI business

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TAS compliance

This paper explains an unemployment model that has output calibrated against a range of expert views and enables a user to create custom scenarios. It complies with the principles in the Financial Reporting Council's Technical Actuarial Standard "TAS 100: Principles for Technical Actuarial Work". Any person using this paper should exercise judgement over its suitability and relevance for their purpose.

1 Introduction

1.1 Purpose

The UK Government's pandemic response includes interventions that may limit the transmission of the SARS-CoV-2 virus but also may lead to a severe economic recession. The UK recession is potentially on a scale that has not been seen since the post-First World War crash of 1918 – 1920 [3]. The UK has comparatively fared worse than other European countries with a GDP contraction in the second quarter of 2020 at 20.4%; the deepest on record [4].

However, the UK government has taken unprecedented measures to protect jobs and limit the level of unemployment. The need was considered extreme and the response, to mitigate the scale of

unemployment, limit financial hardship and prevent permanent scarring to the UK economy, recognised as bold.

Large scale unemployment has significant consequences to population health and wellbeing [5]. It is known that unemployment causes financial distress that is strongly correlated to an increase in mental health issues that, in turn, may have implications on claims for Income Protection and PMI insurers.

The working group focus with this bulletin is a discussion on possible future scenarios of unemployment over the second half of 2020 and beyond. Given the highly uncertain times, this bulletin and accompanying model are intended to provide a grounding for discussion but does not aim to provide a forecast or advice.

1.2 Overview of Government interventions

Since March 2020, the government has taken several interventions to protect employment including the following measures [6]:

- **The Coronavirus Job Retention Scheme (CJRS).** This scheme is applicable to those who are in contract employment. From March to June 2020, the CJRS scheme paid 80% of an employee's salary, up to a maximum of £2,500 a month, for employees placed on leave. During this phase, employers could only claim support for workers that had been furloughed [1]completely. However, from July to October 2020 the CJRS scheme is being scaled back; the proportion of furloughed workers is being reduced and workers will be allowed to be brought back on reduced hours. From August 2020, employers are liable to pay pension contributions and National Insurance per employee. Then as of September 2020, employers will need to pay 10% of the employee's salary, 20% in October and 100% of the costs by the end of October when the scheme ends. According to the latest figures from Her Majesty's Revenue & Customs (HMRC), the total number of jobs that have been furloughed is 9.6m [7].
- **The Self-Employment Income Support Scheme (SEISS)**. This scheme is applicable to those who are self-employed. There are two payments in the form of three-month grants: the first is set at 80% of the average monthly profits over the past three years of trading (up to a maximum of £7,500); and the second is 70% of average monthly profits over 3 years (up to a maximum of £6,570). This scheme is limited to firms where annual trading profit does not exceed £50,000, and targets those where trading has been adversely affected by COVID-19. There have been 2.6 million claimants on this scheme [8].
- **VAT payments deferral scheme**. This scheme is applicable to Value Added Tax (VAT) registered businesses. This scheme launched on 20th March 2020 and ended on the 30th June 2020. The aim was to support businesses and limit the number of job losses and bankruptcies declared [9].
- **Eat Out to Help Out Scheme**. This scheme is applicable to consumers. It launched on 13th July 2020 with the aim of supporting the hospitality industry e.g. restaurants [10].
- **Coronavirus Business Interruption Loan Scheme (CBILS).** This scheme provides business support for smaller businesses affected by coronavirus. It will help small to medium-sized businesses to access loans and other kinds of finance up to £5m. The government guarantees 80% of the finance to the lender and pays interest and any fees for the first 12 months [11].

These schemes have been critiqued to varying degrees but overall, have been extremely successful at preventing widespread unemployment up to end of July 2020 [12]. The CJRS at its peak covered about 1 in every 4 UK employees and so, as these schemes come to an end it is logical that to expect job

[1] Furlough refers to a leave of absence. However, 'Furlough' is commonly now used in reference to the CJRS.

losses [1]. This expectation is more likely given the virus is still prevalent in society and, in lieu of a vaccination, non-pharmaceutical interventions (NPI) such as social distancing and/or ‘lock-down’ restricting freedoms of movement and gatherings are the ‘go-to’ option for safeguarding population health. Although these NPI’s can prevent the virus from spreading, they can also slow the transition of money in the economy and so create uncertain economic conditions for business.

2 Unemployment model

2.1 Unemployment model application

To enable users to explore possible scenarios of unemployment under different assumptions, the working group built an application in R that can be accessed by clicking the link below using R-Shiny:

https://johnng.shinyapps.io/Unemployment-MultiStateModel/

This application enables the user to access a range of scenarios considered in this bulletin and create custom scenarios. The model code can be accessed via the following Github site with the aim of encouraging transparency and collaboration:

https://github.com/wuihuajohnng/Unemployment_MultiState_Model

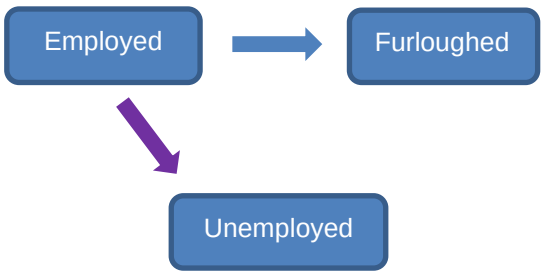
2.1.1 High level overview

A multi-state model (or compartmental model) has been constructed with three states: *Employed*, *Furloughed* and *Unemployed*. The model has two phases 1. *Furlough* (state prior to start of unwinding of scheme) and 2. *Post-Furlough* (including transition out of furlough as scheme unwinds).

2.1.2 Furlough

This is based on the situation prior to when the furlough scheme will start unwinding, where employment status can either go from employed to furlough or unemployed states. Alternatively, a life can remain in employed.

Figure 1: Furlough states



The transitions in the *Furlough* phase are:

1. transfer from *Employed* to *Furloughed* (Figure 1 – blue arrows).
2. transfer from *Employed* to *Unemployed* states (Figure 1 – purple arrow)
3. the opposite of the sum of the transition nets out, equals the force to remain employed. This therefore exhausts all transition possibilities.

In this phase the following transitions are considered small, so to simplify the model it is assumed there is no transfer: *Furloughed* to *Unemployed, Furloughed* to *Employed and Unemployed to Employed*.

It is assumed to be an unlikely climate for mass hiring of new staff, although some businesses like super-markets and deliveries has seen an increase in demand but it is not widespread in the economy. There is assumed to be limited rationale for employers to transfer staff to unemployed given the high level of salary covered by the furlough scheme.

Each pair of transitions includes two parameters:

- a ratio parameter that can be used to vary the steady-state relative sizes of the states without altering the rate at which that steady-state is approached
- a dampening parameter, which can be used to vary the rate at which that steady-state is reached without affecting the relative sizes of the states at steady-state.

For example, the working group assumed the ratio of *Furloughed* to *Employed* will converge to 0.39 on the 1st August 2020; close to the ratio on the 1st May (starting point of the scenario).

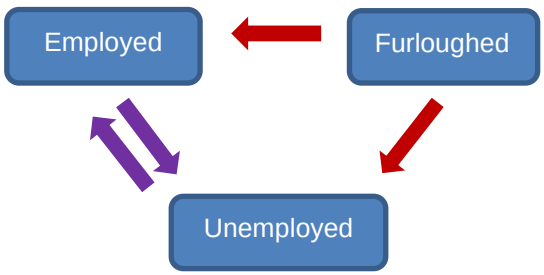
(These parameters are described in more detail in the Appendix).

The working group calibrated the ratio parameters such that a steady state number of employees in Furlough was maintained until the furlough scheme begins to unwind, which was assumed to be the 1st August 2020. Available data neither suggests an increasing nor decreasing trend for any of the states which further simplifies the model [12].

2.1.3 Post-Furlough

This represents the position *Post-Furlough,* including the transition out of furlough as the scheme starts to unwind. In order to keep the model simple, we have assumed the scheme will start this transition from *Furloughed* to *Employed* or *Unemployed* states from 1st August 2020.

Figure 2: Post-Furlough states



Considering the transitions that are the reciprocal transfers from *Employed* to *Unemployed* states (Figure 2– purple arrows). This ratio parameter is the steady state between these states i.e. recovery where unemployment returns back to the 4.1% level pre-recession and the associated dampening parameters is the time taken to reach this state. For example, depending on the scenario, a slow return to pre-recession level will result in a high dampening parameter e.g. 500 days for the BoE (Aug) forecast and 1000 days for the OBR central forecast.

The transition from *Furloughed* to either *Employed* or *Unemployed* states is calibrated to determine the proportion of those furloughed workers that immediately re-join the workforce and the associated dampening parameter is the time taken to reach this state where the *Furloughed* state is approaching 0 (end of scheme or no furlough support). For example, the period 1st August to 31st October 2020 is 91 days but the modelled forecast could use an assumption higher than 91 days to convey some level of further government support beyond this transition to employment.

For the *Post-Furlough* phase, the working group used various sources (section 2.2) to calibrate the parameters including the OBR, BoE and other forecasters. However, the model has functionality to create custom scenarios to encourage discussions and explore the possible effects on unemployment based on your own alternative scenarios.

2.2 Scenario descriptions

Within the model, the working group considered a range of expert views on future unemployment which are summarised in the table below.

Table 1: Summary descriptions of scenario options

Scenario option	Description of option
OBR central	In this scenario, unemployment is suggested to peak at around 12% in 2020 Q4 and fall gradually back to around 6% in Q3 2023. Some labour market scarring is assumed in the central and downside scenarios, but not in the upside scenario. Structural change in the context of continuing uncertainty would slow the recovery in both the central and downside scenarios.
OBR Upside	In this scenario, unemployment is suggested to peak at around 10% in Q3 2020 but return rapidly to the pre-recession level of unemployment around Q2 2021. This reflects the OBR assumption that a rapid resolution of the health crisis would reduce the need for reallocation of labour across sectors, allowing employment to recover relatively quickly.
OBR Downside	In this scenario, unemployment rises rapidly and peaks around 13% in Q1/Q2 2021 and then gradually falls to around 7% in Q3 2023. Like the central scenario, some labour market scarring is assumed along with structural change in the context of continuing uncertainty.
BoE central (May 2020 Monetary Policy Report)	In the May quarterly update, the Bank of England expected unemployment to reach 9.0% in Q2 2020, however, the furlough scheme has been very successful at preventing unemployment increasing over Q2. The working group assumed 9% in Q4 2020 in this scenario. It is assumed there will be a gradual return to pre-recession levels of employment by Q1 2023.
BoE central (Aug 2020 Monetary Policy Report)	The latest view from the Bank of England, at the time of bulletin release, is more positive compared to the May 2020 report. Unemployment is expected to rise to around 7.5% in Q4 2020. This is expected to be followed by a gradual decline from this peak back to Pre-Furlough levels by Q3 2023.
Other forecasters expectations - central[2]	In the annex of the Bank of England's Monetary Policy Report August 2020, the results of the Bank's most recent survey of external forecasters are summarised. The unemployment rate is expected to increase on average to 7.5% in Q3 2020, however, the range of projections was wide reflecting the continuing uncertainty due, in part, to COVID-19 and the pandemic response measures.
Other forecasters expectations – Upside[3]	The upside of the range is for unemployment to rise and peak at 5.5% in Q3 2021 and then to fall to 4.5% for 2022 Q3.
Other forecasters expectations - Downside[4]	The downside of the range is for unemployment to rise to 10% in Q3 2020 and then gradually reduce over to time to 7.0% in Q3 2023.

Sources: [1] [2] [13] [14]

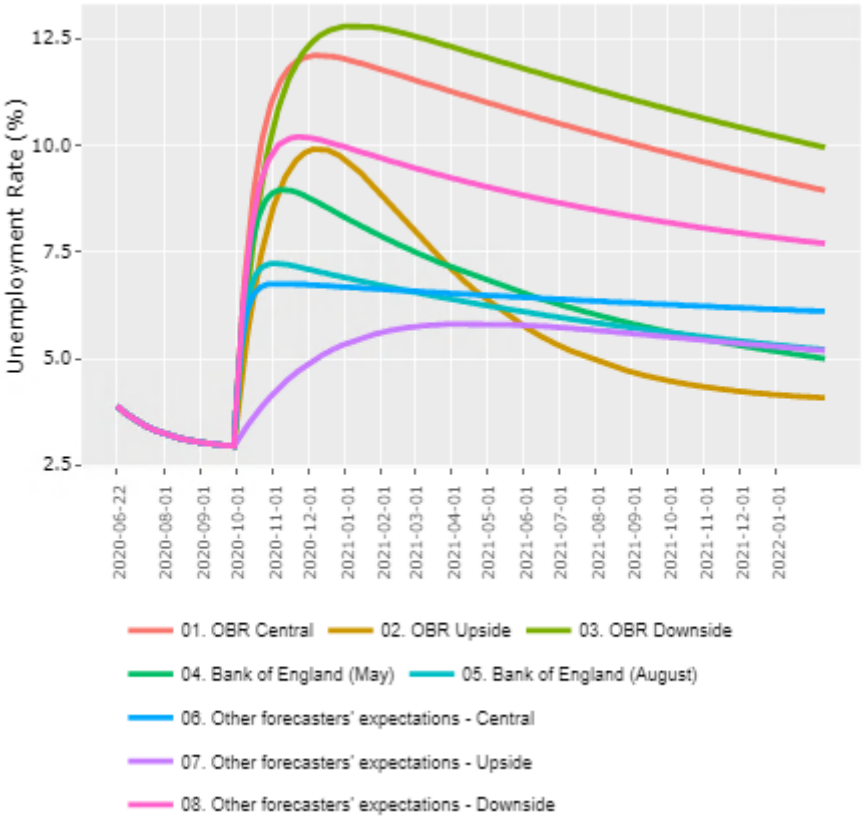
[2] average of forecasters' projections
[3] this is the bottom of the range of forecasters' projections
[4] this is the top of the range of forecasters' projections

2.3 Output from model

The starting point of our scenario model is based on Office of National Statistics data, Feb to April 20 (Section 3). This was the used at the start of the Furlough scenario from 22/6/2020 up to 1/8/2020.

Comparing the wide range of expert views over the short to medium/long term illustrates a high level of uncertainty (selected from our R-Shiny model). The range of possible unemployment scenarios over the short term (Q4 2020 i.e. one quarter) could be anywhere between 5.5% and 13%. In the medium term (Q4 2021 i.e. one year), the range is still wide ranging from 4.0% to 10.25% (Figure 3).

Figure 3 : Comparison of unemployment rates



Source: https://johnng.shinyapps.io/Unemployment-MultiStateModel/

2.4 Interpreting outputs from model

Actuaries involved in pricing or reserving Income Protection/PMI business may be required to make assumptions about the level of unemployment given the correlation with health and wellbeing. Assumption setting can be difficult given the wide range in the expert views provided and actuaries may also need to consider a range of other factors given these views are based on the general population and so may not be generalisable to an insurance portfolio of lives.

The economic situation and government interventions over the coming months will need to be closely monitored as new economic data is released. The BoE has significantly changed its view in only one quarter, from May to August 2020, based on the more encouraging economic data over the recent months. However, this situation is highly dependent on what happens in the 2nd half of 2020 and beyond; where government interventions may change rapidly in order to maintain control of the COVID-19 pandemic.

2.5 Factors to consider

This is a complex area and the working group refer the reader to the comprehensive Bank of England and OBR publications [1] [2]. There are a wide range of factors to consider in making assumptions about unemployment during a pandemic. The working group provide a short list of some key factors considered below:

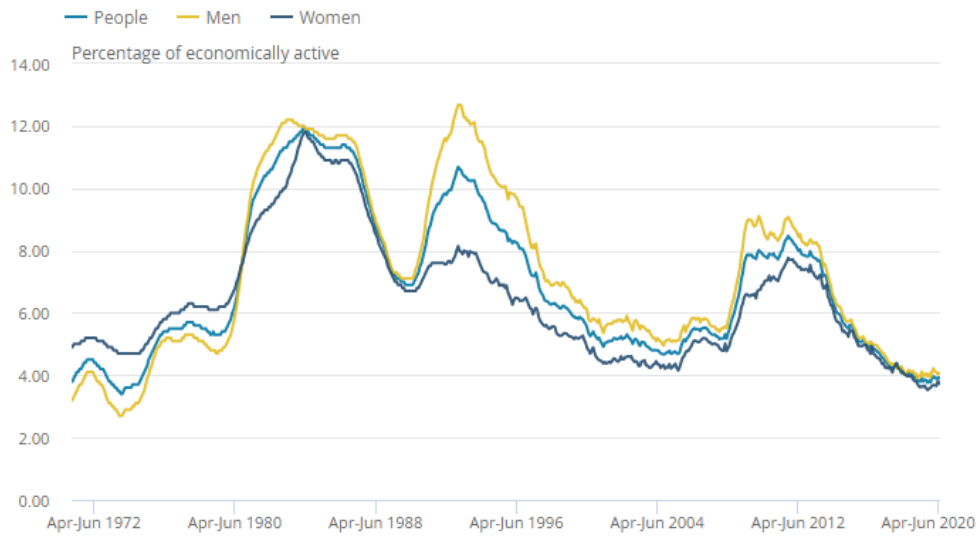
Government interventions	• Non-pharmaceutical interventions
	  ○ Lockdown measures national/local
	  ○ Relaxation of lockdown measures
	• Benefits support to maintain people in jobs:
	  ○ CJRS and SEISS schemes
	  ○ VAT payments deferral scheme
	  ○ Buy to eat scheme
	  ○ CBILS scheme
	• Budgetary constraints

Demand in the economy	• Demand depends on how confident people feel about shopping, going to restaurants, cafes, etc. • Social-distancing measures will directly impact the viability of some businesses - e.g., restaurants, beauty salons, pubs etc.
Vaccines/treatments	• The development, at scale production and distribution of an effective vaccine or medical treatment will enable a rapid return to pre-recession employment levels - e.g. upside OBR scenario.

2.6 Historical unemployment rates in the UK

It is useful to compare possible future unemployment scenarios against historical rates of unemployment (Figure 4). Currently, unemployment is around 4% and the working group expects the unemployment rate to increase significantly over the 2nd half of 2020 and possibly into 2021 (Section 2.3). The BoE forecast of 7.5% in Q3 2020 is similar to the 2008/2009 recession whereas the OBR central forecast is closer to the recession of the 1980's.

Figure 4: Unemployment rates in UK (aged 16 years and over), seasonally adjusted, between March 1971 to April to June 2020



Source: Office of National Statistics – Labour Force Survey

The current recession is different in nature; being caused by a crisis initiating in the population's health rather than in finance and banking as in 2008. This is reflected in the OBR and BoE central forecasts which suggest a slower recovery due to expected structural changes (shift or change in the way a market or economy functions or operates) e.g. both OBR and BoE central scenario suggest recovery will take about 2-3 years.

Given unemployment rates and economic recovery is highly dependent on Government inventions to control the infection rate of the virus (and the virus transmission itself), predicting any peak or recovery is subject to a high level of uncertainty.

2.7 Other countries (Unemployment rates)

During a global pandemic, countries can and have taken different interventions. It is useful to understand the unemployment rates in other countries and the change since COVID-19 started to spread early in the first quarter of 2020 (Figure 5). However, care must be taken in any comparison as each country will be impacted differently due to the different profile of industry by sector and the range and timing of non-pharmaceutical measures implemented such as 'lockdown'. There are also a range of different government interventions in terms of supporting employers and employees through the health crisis e.g. UK furlough scheme or universal basic income.

Figure 5: Unemployment rate pre-Covid against latest

Country	Unemployment (pre-Covid)	Unemployment (latest)
United States	3.5% (Feb)	10.2% (Jul)
Canada	5.6% (Feb)	10.9% (Jul)
Britain	3.9% (Dec)	3.9% (May)
France	8.2% (Jan)	7.7% (Jun)
Germany	3.2% (Jan)	4.2% (Jun)
Italy	9.8% (Jan)	8.8% (Jun)
Spain	13.7% (Jan)	15.6% (Jun)
Poland	5.5% (Feb)	6.1% (Jun)
Sweden	8.2% (Feb)	9.8% (Jun)
Australia	5.1% (Feb)	7.5% (Jul)
India	7.8% (Feb)	7.4% (Jul)
Brazil	11.2% (Jan)	13.3% (Jun)
Israel	3.4% (Feb)	4.5% (Jun)

Source: The economist (15th August and 28th March 2020), Economic data, commodities and markets

In the United States of America (USA), unemployment has increased rapidly with little government support for retaining jobs. However, the USA government scheme provides greater support to those who have been made unemployed, rather than focusing on retaining the connection between the employee and employer. Unemployment went from 3.5% in February to 10.2% July 2020 (peaking in April at 14.7%). Although the USA is a very different country in many ways, it does give an indication of the magnitude of possible increases in unemployment rates in the UK post-furlough.

Within Europe, some countries such as France, Germany, Italy, Spain, Poland and Sweden have not seen any significant increases in unemployment as of the date of this bulletin. There is evidence in Germany, Spain and Poland that unemployment is starting to increase e.g. Germany going from 3.2% (Jan) to 4.2% (Jun). Most European countries have been less impacted by COVID-19 than the UK, both in terms of the number of deaths and economically.

Sweden has had a higher rate of COVID-19 infection adopting a different strategy of more limited measures to control virus transmission unlike the national lockdown in the UK. Their unemployment rate has also increased from 8.2% (Feb) to 9.8% (Jun) which may be explained by the impact of the global recession.

Countries in Latin America including Argentina, Brazil and Mexico, are seeing a high surge of COVID-19 infections and deaths. However, in Brazil, unemployment has only increased by around 2% as of the date of this bulletin.

India is being severely impacted by COVID-19 and adopted the non-pharmaceutical intervention of a national lockdown. The unemployment rates increased to a high of 23.5% over April and May 2020 but has, since then, rapidly recovered to around pre-pandemic levels.

Australia has experienced resurgence of COVID-19 cases in some cities leading to localised lockdowns. Although the virus has been relatively well contained, the unemployment rate has increase by around 2-3% within the past few months to 7.5% (Jun).

Israel has experienced an increase to 4.5% from an all-time low of 3.4% in February. Israel is currently in it's 2nd wave of COVID-19 and the Israeli government is planning further lockdown restrictions which will impact unemployment and will lead to further economic uncertainty. Israel has an extremely flexible labour market and the government plans to increase this flexibility further along with several other measures to limit economic consequences as a result of COVID-19 interventions.

There is therefore no easily seen link between the prevalence of virus transmission, deaths and economic indicators such as employment.

3 Data source used

3.1 Description of data

The Office of National Statistics (ONS), Nomis, official labour market statistics were used to determine the input into the model for employed and unemployed [12]:

- Total economically active – aged 16 and over is 34,626,606 (Feb 2020 to April 2020)
- Total unemployed – aged 16 and over is 1,335,531

Statistics sourced from GOV.UK and HMRC were used for the number furloughed [6]:

- Total number of jobs furloughed, 9.1m (May 2020)

4 Key limitations and unknowns

4.1 Modelling limitations

The working group assumed the furlough scheme starts to unwind on 1st August 2020, which is a simplification as some unwinding has commenced from July but will accelerate from early August.

The modelling is intentionally simplistic given the incredible complexity of the real-world circumstances. The model has two main parameters; it assumes that the ratio of the transitions converges to a steady state, and a dampening parameter on how long to reach this state. The model does not allow for complex interactions or government interventions that may impact the shape of

unemployment in the future e.g. a second wave of the pandemic, local outbreaks or a second national lockdown.

Modelling is focused on the unwinding of the CJRS scheme and not the SEISS scheme. Although this is a simplification, the working group believe it is satisfactory for the objective of the model (to create discussion regarding unemployment on population health and wellbeing and claims implications) as it covers the majority of retained jobs to date.

The working group have not explicitly allowed for different sectors being impacted to varying degrees, however, the calibrations to the BoE or OBR views do allow for this.

4.2 Data limitations

The working group have based our initial starting point (Furlough) on UK Government sources of data for unemployment, employed and furloughed. Limited checks have been carried out against other data sources, but the data should not be viewed as independently validated.

Unemployment is defined as those registered and actively seeking work so unemployment statistics may underestimate the true unemployment rate. It may also underestimate the number transitioning to alternative forms of employment such as zero-hours contracts which may also impact population health and wellbeing by reducing financial security but may not directly impact insurance claims.

5 Conclusions

COVID-19 has caused a severe economic recession in the UK due to unprecedented government interventions to control the pandemic including a national lockdown of the UK economy. The uncertainty in economic conditions is expected to continue which is illustrated by a wide range of expert views on unemployment, in the short through to medium/long term, including views from: the Office of Budget Responsibility (OBR); the Bank of England (BoE); and other forecasters.

Actuaries will have to make difficult judgement calls on future forecasters of unemployment when they are considering the impact on disability or PMI business given the correlation between unemployment and health/wellbeing.

This bulletin focuses on UK unemployment forecasts where we have provided an application using R-Shiny to enable actuaries to consider a range of expert opinions and to customise their own scenarios.

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7 Appendix

Parameter	Explanation
Em_t	Number Employed at time t
Un_t	Number Unemployed at time t
Fu_t	Number Furloughed at time t
endFur	The number of days from the start of the simulation to when the furlough scheme ends. Currently set to 1st November, 101 days after the start date of 22nd June.
Pre_EmFu_ratio	The ratio of rate of transfers from Employed to Furloughed compartments. Determines the steady-state ratio proportion.
Pre_EmUn_ratio	The ratio of rate of transfer from Employed to Unemployed compartments. Determines the steady-state ratio proportion.
Pre_EmFu_FuEm_damp	The dampening of the ratio of transfers between the Employed and Furloughed compartments. Determines the time to reach steady-state. The steady state is reached at the end of the Furlough period.
Pre_EmUn_UnEm_damp	The dampening of the ratio of transfers between the Employed and Unemployed compartments. Determines the time to reach steady-state. The steady state is reached at the end of the Furlough period.
Post_FuEm_FuUn_ratio	The ratio of rates of relative transfer from the Furloughed compartment to each of the Employed and Unemployed compartments. Determines the proportion of the Furloughed that immediately re-join the workforce.
Post_FuEm_FuUn_damp	The dampening of the rates of relative transfer from the Furloughed compartments to each of the Employed and Unemployed compartments.
Post_EmUn_ratio	The ratio of rate of transfers from Employed to Unemployed compartments. Determines the steady-state ratio proportions.
Post_EmUn_UnEm_damp	The dampening of the ratio of transfers between the Employed and Unemployed compartments. Determines the time to reach steady-state.

Compartment	Pre and Post Furlough (t>0)
Em_t	Em_{t-1} - Em_Un_{t-1} - Em_Fu_{t-1} + Fu_Em_{t-1} + Um_Em_{t-1} (Em_0 = 23,891,075)
Un_t	Un_{t-1} - Un_Em_{t-1} - Un_Fu_{t-1} + Em_Un_{t-1} + Fu_Un_{t-1} (Un_0 = 1,335,532)
Fu_t	Fu_{t-1} - Fu_Em_{t-1} - Fu_Un_{t-1} +Em_Fu_{t-1} + Un_Fu_{t-1} (Fu_0 = 9,100,000)

Transition	Pre-Furlough	Post-Furlough
Em_Fu_t	Em_t * (Pre_EmFu_ratio / Pre_EmFu_FuEm_damp)	0
Em_Un_t	Em_t * (Pre_EmUn_ratio / Pre_EmUn_UnEm_damp)	Em_t * (Post_EmUn_ratio / Post_EmUn_UnEm_damp)
Un_Em_t	Un_t * (1 / Pre_EmUn_UnEm_damp)	Un_t * (1 / Post_EmUn_UnEm_damp)
Fu_Em_t	Fu_t * (1 / Pre_EmFu_FuEm_damp)	Fu_t * (Post_FuEm_FuUn_ratio / Post_FuEm_FuUn_damp)
Fu_Un_t	0	Fu_t * (1 / Post_FuEm_FuUn_damp)
Um_Fu_t	0	0

Notes

Pre is for Furlough phase

Post is for Post-Furlough phase

Furlough phase (state prior to unwinding of furlough)

Parameter	Value
Pre_EmFu_ratio	0.39
Pre_EmFu_FuEm_damp	40
Pre_EmUn_ratio	0.041
Pre_EmUn_UnEm_damp	40

The dampening parameters are set to 40 which is the number of days from 22/06/2020 to 01/08/2020. We have made the simplification the scheme will start to unwind on 1st August 2020. The parameter ratios are calibrated to maintain a steady state.

Post-Furlough phase (commences when Furlough scheme starts to unwind)

Parameter\scenario options	1	2	3	4	5	6	7	8
Post_FuEm_FuUn_ratio	1.75	1	1.5	3	5	6	6	2.5
Post_FuEm_FuUn_damp	50	100	70	50	50	50	600	50
Post_EmUn _ratio	0.03	0.041	0.04	0.041	0.041	0.053	0.045	0.07
Post_EmUn_UnEm_damp	1000	100	1000	300	500	1000	400	400

Scenario options	Description
1	OBR Central
2	OBR Upside
3	OBR Downside
4	Bank of England (May)
5	Bank of England (August)
6	Other forecasters' expectations Central
7	Other forecasters' expectations Upside
8	Other forecasters' expectations Downside

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