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PRESENTS

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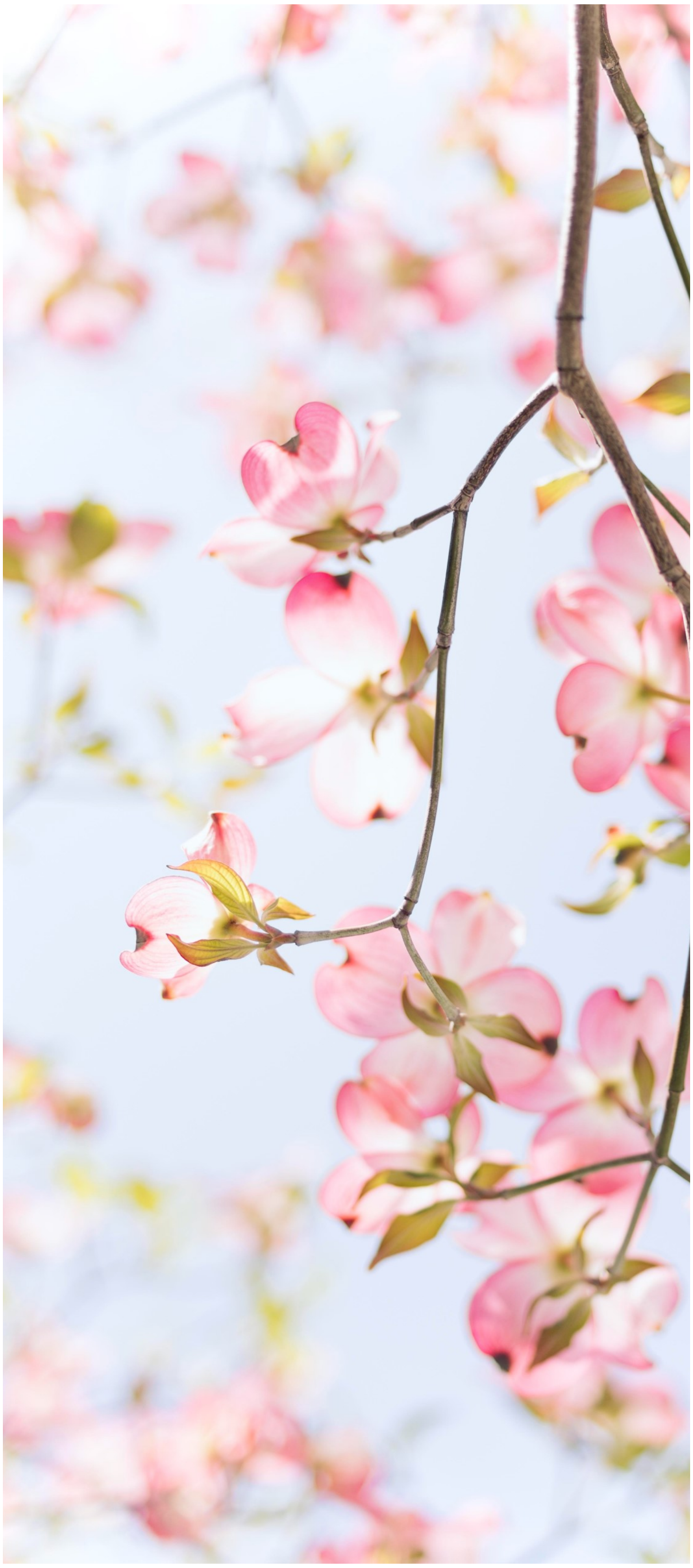

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NOTE FROM THE EDITOR

I hope you have your tissues at the ready as you are about to receive some sad news . This newsletter will be the final one for the year and the final one that I will make for you. Don't worry though as we have (hopefully!) a great final newsletter for you to read!

To start us off, with the topic that is relevant to everybody at the moment, Paarisha Emilie delves into the mathematical modelling used to predict how many people can be infected by Covid-19.

Speaking of things that are relevant for all of us... Brogan Howe returns to discuss the reasons as to why saving for a pension is still relevant for generation Z. For those who studied pensions last year, you may know this is now a touchy subject for our debate group!

Finally, Riddhi Lakotiya gives us information regarding the new International Financial Reporting Standard (IFRS17) and how companies in the financial industry are preparing for the new standard.

So what has been going on when we are not inundated with projects and midterm tests? Well, we have had our flagship event, the Actuarial Conference along with a talk about the new data science certificate that the IFoA have launched. More info about what happened at these events, as well as a sneak peak at future SAS events, can be found near the end of this newsletter!

So for the final time, all that is left to say is happy reading, good luck in your upcoming exams and thank you for making it this far!

FRASER ALBISTON

THE MATHEMATICS BEHIND COVID-19

With growing numbers of people becoming infected with the coronavirus around the world. What sort of mathematical modelling is being used to predict the severity of the virus?

WHAT IS COVID-19?

According to the World Health Organisation (WHO), Covid-19 is 'novel' because it has not been identified in humans before. Because of this, humans are likely to have low, or no, prior immunity to the virus. It causes respiratory illness with symptoms that include runny nose, sore throat, cough, and fever. It can be more severe for some people and can lead to pneumonia or breathing difficulties.

As of 11th February 2020, 25 countries had a total of 43,107 confirmed cases of the coronavirus and there have been 1,018 deaths.

THE SPREAD OF COVID-19

The two key factors that determine how quickly a disease will spread are:

1. The average number of people a single person is likely to infect
2. How long it takes for these infections to happen

R_0 is a mathematical term that specifies the average number of people who will catch a disease from one contagious person. It is specifically applied to a population of people who were previously free of infection and haven't been vaccinated.

Several teams around the world have used models to estimate R_0 from available case data. Depending upon the methods used, estimates of R_0 for the new coronavirus have ranged from 1.3 (similar to seasonal influenza) up to 3 or 4 (similar to SARS).

Professor James McCaw of University of Melbourne is part of a working group convened by the WHO to attempt to model the spread of the virus in the general population. The group's modelling shows that each infected person tends to infect three other people. That makes it more infectious than the flu, but less infectious than SARS and much less infectious than measles, where one person is like to infect up to 20 people.

The 'serial interval' is related to how quickly a virus multiplies, and it can have a big effect on the model. Early estimates indicate that the new coronavirus has a serial interval of around 7 days, which is substantially longer than for influenza which sits at around 3 or 4 days.

While it may seem that a more severe disease would be of greater concern, it may be easier to control. When symptoms are severe, infected people are more visible, making them easier to identify, quarantine and treat. In fact, people experiencing severe symptoms are more likely to reduce their contact with others, so reducing the rate at which they spread infection.

Besides that, China introduced travel restrictions on 23rd January 2020 which affected 20 million people, later extending these to around 50 million people. These restrictions may have come too late to prevent the spread of outbreak to other parts of China, but there is still hope that they may help limit global transmission. However, models of past outbreaks suggest that while travel restrictions may delay the spread of an outbreak, they have less effect on reducing its size.

CONCLUSION

As new information emerges during an outbreak the assumptions and data that feed into models are updated, leading to a constant revision of estimated risks, impact and controllability. There will always be uncertainties both in the data captured during an outbreak and the estimates generated by models.

BY **PAARISHA EMILIE**

REFERENCES
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ARE PENSIONS STILL RELEVANT FOR GENERATION Z?

For many people at the beginning of their careers, retirement seems quite far away , more pressing matters take priority, such as perhaps saving and buying a home, buying a car and paying off student debt. But are pensions really still relevant for generation Z or is there more modern ways of saving money for retirement?

Generation Z is the newest generation to be named and includes people born between 1995 and 2010. Generation Z are highly proficient in technology and are very aware of their finances and wider financial issues, this is as a result of generation Z witnessing the financial hardship suffered by their parents during the 2008 financial crisis. For clarity, a pension is a fund into which a person contributes money into during their careers, they hope the interest gained throughout many years of working, will mean they can withdraw money from this fund in retirement to support living to a 'comfortable standard'.

It should be noted that pensions come with certain tax relief and compulsory employer contributions, resulting in free money! In the UK if a basic rate taxpayer contributes £80 into a pension, Her Majesty's Revenue and Customs (HMRC) adds an extra £20 into the pension fund on the basic rate taxpayers' behalf. For higher and addition rate UK taxpayers HMRC would contribute £40 and £45 respectively into their pensions. Since the introduction of Auto Enrolment in the UK in 2012, employers are required to enrol all qualifying employees into a workplace pension and make contributions on the employees' behalf. From the 6 April 2019, employers are required to contribute a minimum of 3% of the employees qualifying earnings and employees contribute 5%, although 1% of the employee's contributions is paid as a basic rate tax relief described above. Also, many companies will contribute more than the minimum of 3% and some will match or even better employee contributions. It is obvious that the tax relief and employer contributions results in employees' pensions becoming much bigger, which with interest will accumulate to a substantial sum of money to support the employee's retirement.

On the other hand, sceptics would argue that many companies are switching workplace pensions from Defined Benefit schemes to Defined Contribution schemes. This means that employees themselves now take on the investment risk that the assets that the employee chooses to invest their contributions perform badly. This could result in employees accumulating a fund to a level much lower than they had anticipated or hoped, which in turn may cause problems for employees who wish to purchase an annuity at retirement and find that the money they have saved will not result in an income stream they require.

There are alternatives to pensions such as individual savings accounts (ISAs) and investing into a property portfolio. Investing in property in order to support retirement involves, whilst working, continually climbing the property ladder, and then downsizing to a smaller sized house before retirement. This means that living costs should be lower and the lump sum generated by the sale of the larger property is used to support retirement. Another property strategy could be to rent out houses or flats purchased using a buy-to-let mortgage. The rent generated is used to cover, hopefully all of, the mortgage payments. As the mortgage amount reduces, the house/flat could be sold to generate a lump sum or it could continue to be rented out, providing a continuous income stream.

There are drawbacks to investing in property such as high management and legal costs associated with acquiring new property and selling property. If the property is being rented out this can cause a lot of stress and problems for the property landlord if the tenants don't pay rent on time or if appliances in the property begin to go faulty and need replaced at the landlord's expense. In addition to this, with growing life expectancy, is investing in property a sustainable source of retirement income considering, using the Office for National Statistics life expectancy calculator, a 20-year-old male has a 25% chance of living to 96 years old?

In summary, it is clear to see the financial benefits of saving into a pension due to the tax relief and compulsory employer contributions. Although some people may prefer to invest into a physical asset such as property, due to the financial maturity of generation Z and the increasing life expectancy, pensions are indeed still very relevant for generation Z.

BY **BROGAN HOWE**

REFERENCES

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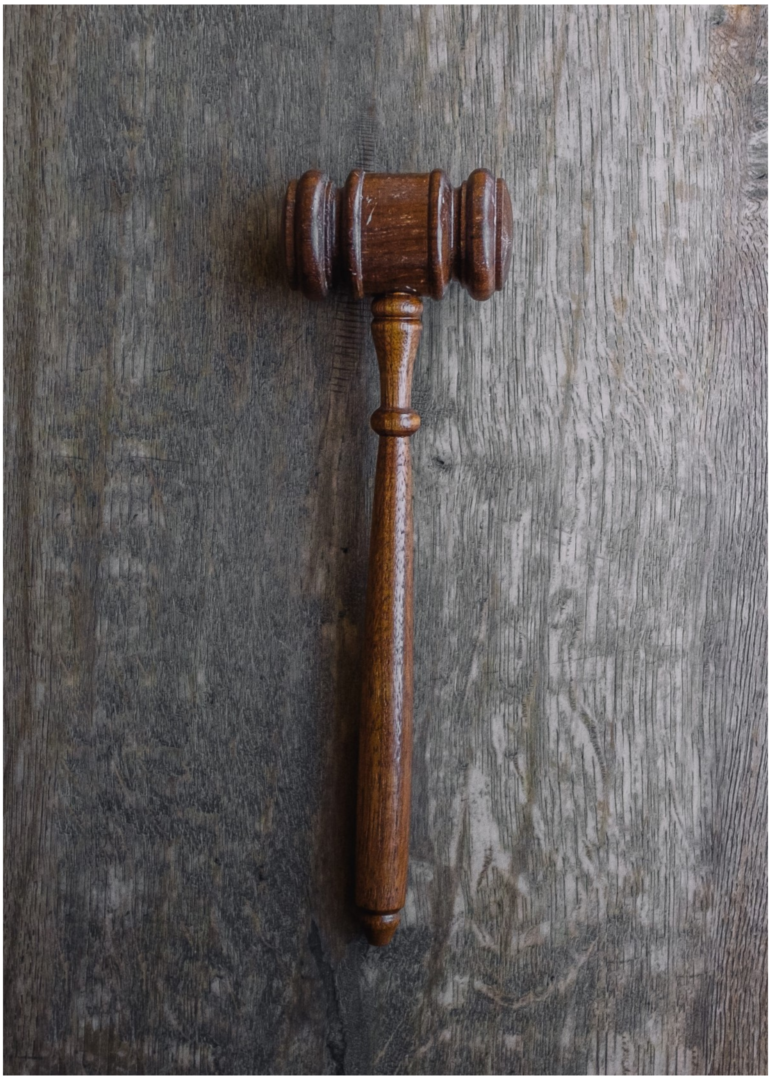

The financial industry is going through a lot of changes thanks to new financial reporting standards. But how are insurance companies affected by the new standard?

IFRS (International financial reporting standards) is a common way to compare businesses across the world. The methods of presenting the reports are being changed and implemented by January 2021. The companies have only been given 3.5 years to adjust to them. This will affect 450 listed insurers and a total $13 trillion in assets (in 2015). The two major changes between IFRS 4 to IFRS 17 is under liability measurement and profitability recognition. This is going to have significant impacts on insurance contracts.

With the new system, there are 3 models being introduced for different contract types called, Building block approach (BBA), Premium allocation approach (PAA) and Variable fee approach (VFA). In general, this will ensure the companies are measuring insurance contracts using current estimates and assumptions, that show the timing of cashflows as well as any uncertainty related to the insurance contracts . Also, it requires the companies to present profits during the insurance contract and give information about the future expectations.

Moving from IFRS 4 to IFRS 17 has many advantages for insurance companies. It will make comparing the accounts of different worldwide insurance companies easier. Secondly there is higher transparency for the investors and third parties. This means that it is easier for the relevant parties to view accurate information regarding the accounts of financial companies. It also gives a fairer reflection of profits, and the liabilities are valued at market value. These improvements bring about greater investor confidence .

As this is a major modification, the insurance companies have to make paramount changes inside the company. They will have to re-train their staff, to give them the necessary skills to efficiently adapt to the new system. Also, they will have to make changes to their financial system and change the way of writing their report for external parties. These activities have an excessive cost and are time consuming for the companies.

In conclusion, moving from IFRS 4 to IFRS 17 will have drastic changes in the way insurance contracts are made. These improvements were not only necessary but essential for the development of the insurance industry and the betterment of its future.

BY **RIDDHI LAKHOTIYA**

REFERENCES
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EVENTS AND ENTERTAINMENT

We have had some very educational and interesting events recently. Our annual 2020 actuarial conference was a huge success and included three extremely knowledgeable speakers! More recently, we also had Colin Thores, Education Actuary at the IFoA give an insightful presentation on the new data science certificate that many of you may choose to complete in the future! We will keep you updated with upcoming events such as revision sessions for those dreaded exams along with a meet up for dinner!

SAS ANNUAL CONFERENCE 2020

Our flagship event! With the theme of Bridging the Actuarial Gap, guests speakers Martin Clarke, Professor Clifford Friend and Dr Liz McFall gave us an insight into what is going on in the actuarial world. Martin Clarke, Government Actuary, addressed some of the challenges and opportunities available to aspiring actuaries. Professor Clifford Friend, Director of Engagement and Learning at the IFoA discussed how important it is for actuaries to continually develop their skill set to be best prepared for an ever-changing environment. Finally, Dr Liz McFall, Director of Data Civics and Chancellor's Fellow at the University of Edinburgh, gave us an insight into interactive health and life insurance.

IFOA DATA SCIENCE CERTIFICATE

If you did not know, the IFoA have recently launched a new data science certificate with the aim of building a general level of knowledge over the industry. Colin Thores, Education Actuary at the IFoA was kind enough to come and give some more information into the new certificate.

SUDOKU CHALLENGE

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Complete the puzzle above for a chance to win a £10 voucher of your choice! Just scan or take a picture of the completed puzzle (making sure that it's readable) and send to fja3@hw.ac.uk . We'll select one lucky winner from all the correct submissions and we will email you if you won.

CONTEST ENDS 29TH MARCH 2020

STUDENTS' ACTUARIAL SOCIETY

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