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and Faculty
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AUTHORITY

Potential impacts of autonomous vehicles on the UK insurance sector – BOE Quarterly Bulletin 2017 Q1 and update on progress from IFoA AV Working Party

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ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

Imagine a world where cars can drive themselves

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Where cars don't look like cars?

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Where coffee houses transport you from A to B?

Content removed for external publication

Source: <https://www.standard.co.uk/news/transport/revealed-vision-of-how-london-would-look-if-driverless-cars-were-used-by-the-masses-a3484231.html>

Where you can do your shopping on the move?

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Source: <https://www.standard.co.uk/news/transport/revealed-vision-of-how-london-would-look-if-driverless-cars-were-used-by-the-masses-a3484231.html>

Where cars almost never crash?

Content removed for external publication

Source: <https://iwsmt-content-ok2nbdvyp8jbrhdp.stackpathdns.com/95201620215887528.gif>



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Quarterly Bulletin

2017 Q1

Topical article

Potential impacts of autonomous vehicles on the UK insurance sector



[Link to Bank of England Quarterly Bulletin](#)

[Link to YouTube video](#)

So why does the Bank of England care?



BANK OF ENGLAND

Assessment – individual, firm and whole-of-market

Bank of England

Top Down view of **whole market**:
impact of AV on motor insurance sector

DfT / Catapult Transport system

Quantify size & core economic impacts:
trade, gross output & investment, GVA and jobs

Individual motor insurers

Blended view for **single portfolio** of motor insurance: assumptions required

OEMs, Research institutes, Tech Companies

Assessment of safety impact for **individual vehicles**



Research key findings

- Uptake of autonomous vehicles likely to be gradual
 - but wide range of opinion
 - more rapid uptake possible
 - differing views on technological, ethical and regulatory hurdles
- Central forecast projects reduced motor insurance market
 - contraction of the UK motor insurance market of 21% by 2040.
 - but capital requirements only falling by 12%
- Insurers will need to transform their business models
 - expect future success to increasingly rely on partnerships with technology firms and manufacturers.

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Currently some cars on the road have some Level 1 and Level 2 systems.

L1 – either steering or acceleration automated

L2 – steering and acceleration automated but only in narrow specific circumstances

L3 – car can drive itself but driver needs to remain alert

L4 – car can drive itself but only in defined uses e.g. on motorways

L5 – full end to end automation

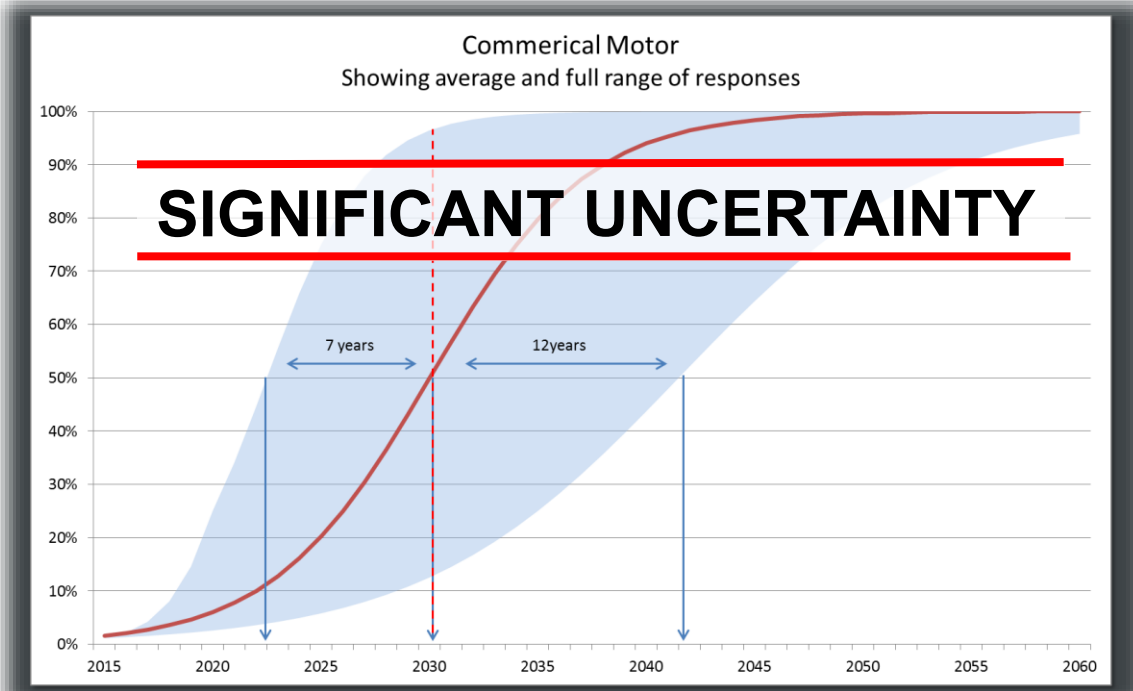
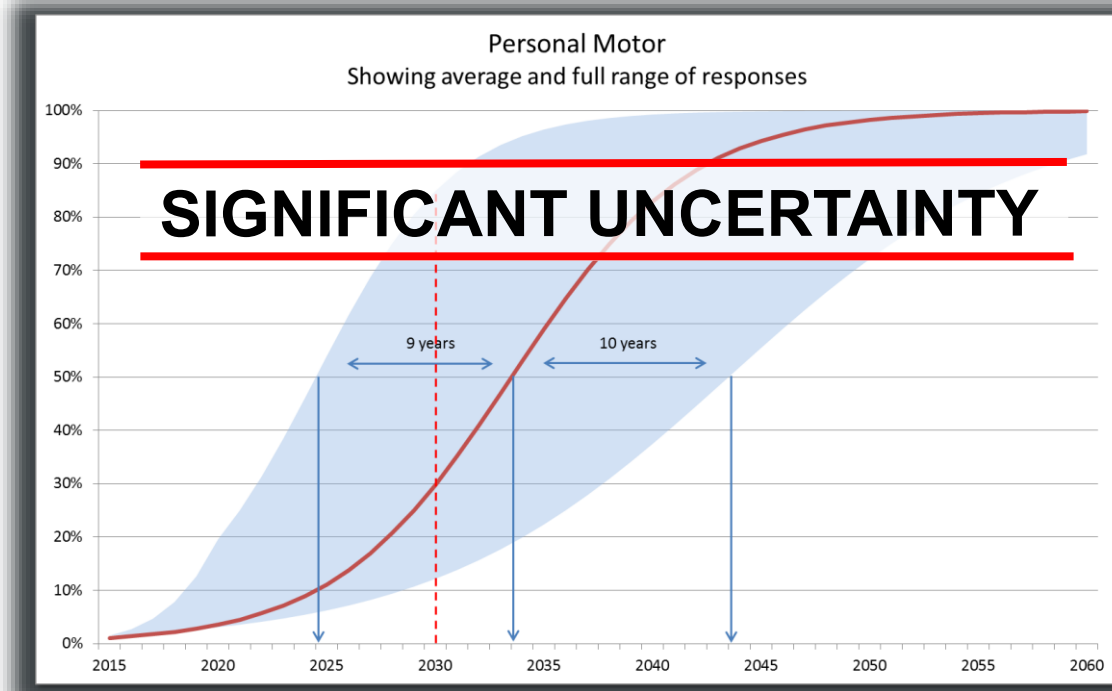
Key observations – Overall Rate of Adoption

Question One: time taken for AV sales to proliferate

- Everyone raise a hand!!
- Keep in mind autonomous means the driver is able to be completely 'out of the loop' for periods of time (L4 or L5)
- Keep your hand up if:
 - 1) you think there will be 10% or more AVs sold in 2030 in UK
 - 2) you think there will be 25% or more AVs sold in 2030 in UK
 - 3) you think there will be 50% or more AVs sold in 2030 in UK

Key Observations – Overall Rate of Adoption

- Great uncertainty as to when AVs will filter in to new car sales
- 30%/50% of new sales for Personal/Commercial are AVs by 2030
- Commercial expected to be adopted ahead of Personal
- Tech firms generally more optimistic on adoption



Question One: time taken for AV sales to proliferate

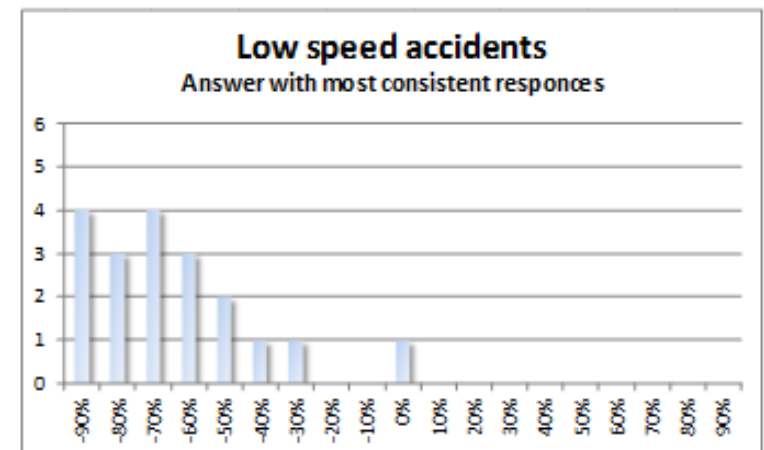
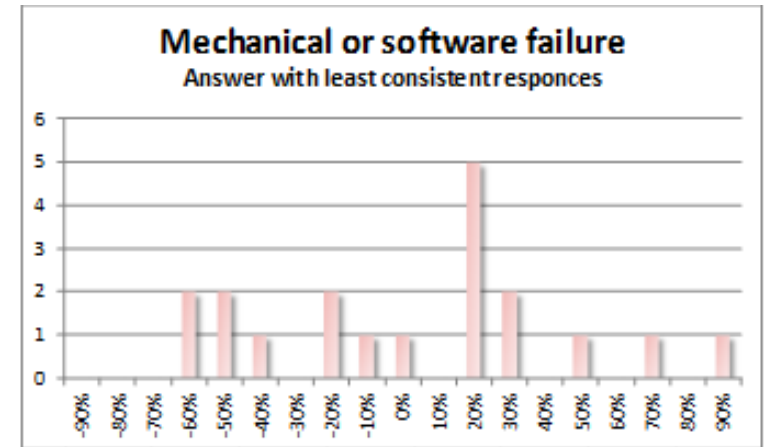
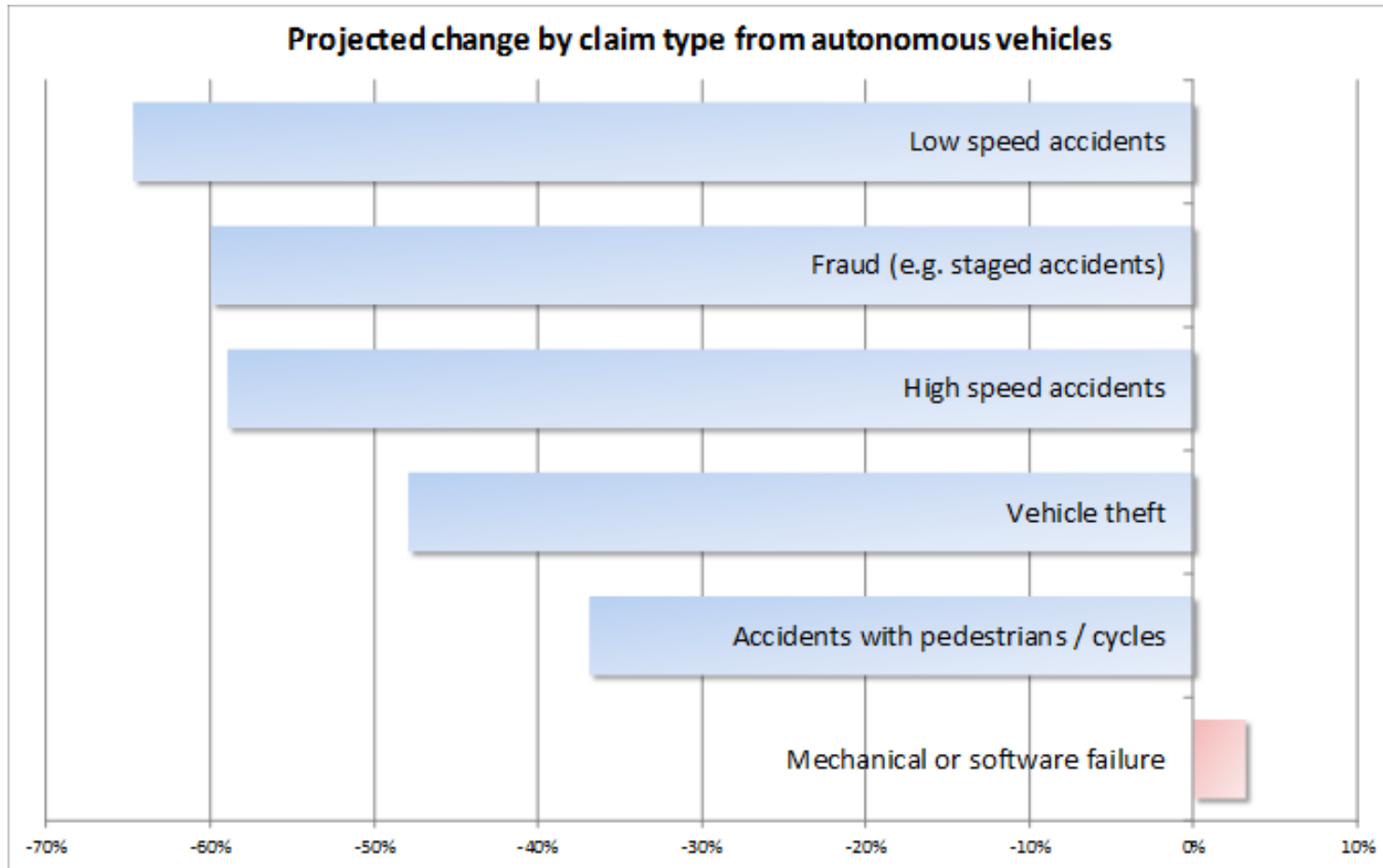
Key Observations – AV impact on insurance claims

Question Seven: estimated impact on claims

- On which type of accident do you think AV will have the greatest impact?
 - 1) Low speed accidents
 - 2) High speed accidents
 - 3) Fraud / staged accidents
 - 4) Vehicle theft
 - 5) Accidents with pedestrians / cycles
 - 6) Mechanical or software failure

Key Observations – AV impact on insurance claims

- Responses suggest a reduction in accidents of up to two thirds (& most consistent responses)
- 60% reduction in fraud; 50% reduction in vehicle theft
- Expected marginal increase in software failures, but mixed opinions



Question Seven: estimated impact on claims

Key Observations – AV impact on insurance claims

Changing claims profile: financial loss per mile per vehicle



UK motor insurance market model

- Made no distinction between motor insurance and product liability insurance
- Used responses to questionnaire on:
 - Q1: When AVs enter the market
 - Q2: Number of total vehicles in 2030
 - Q3: Increase in number of miles travelled by AVs
 - Q7: Claim frequencies
- The risk premium (per policy) is based on the DV and AV mix each year

The BASE CASE (UK private car market)

This is our initial forecast assuming no AVs enter the market.

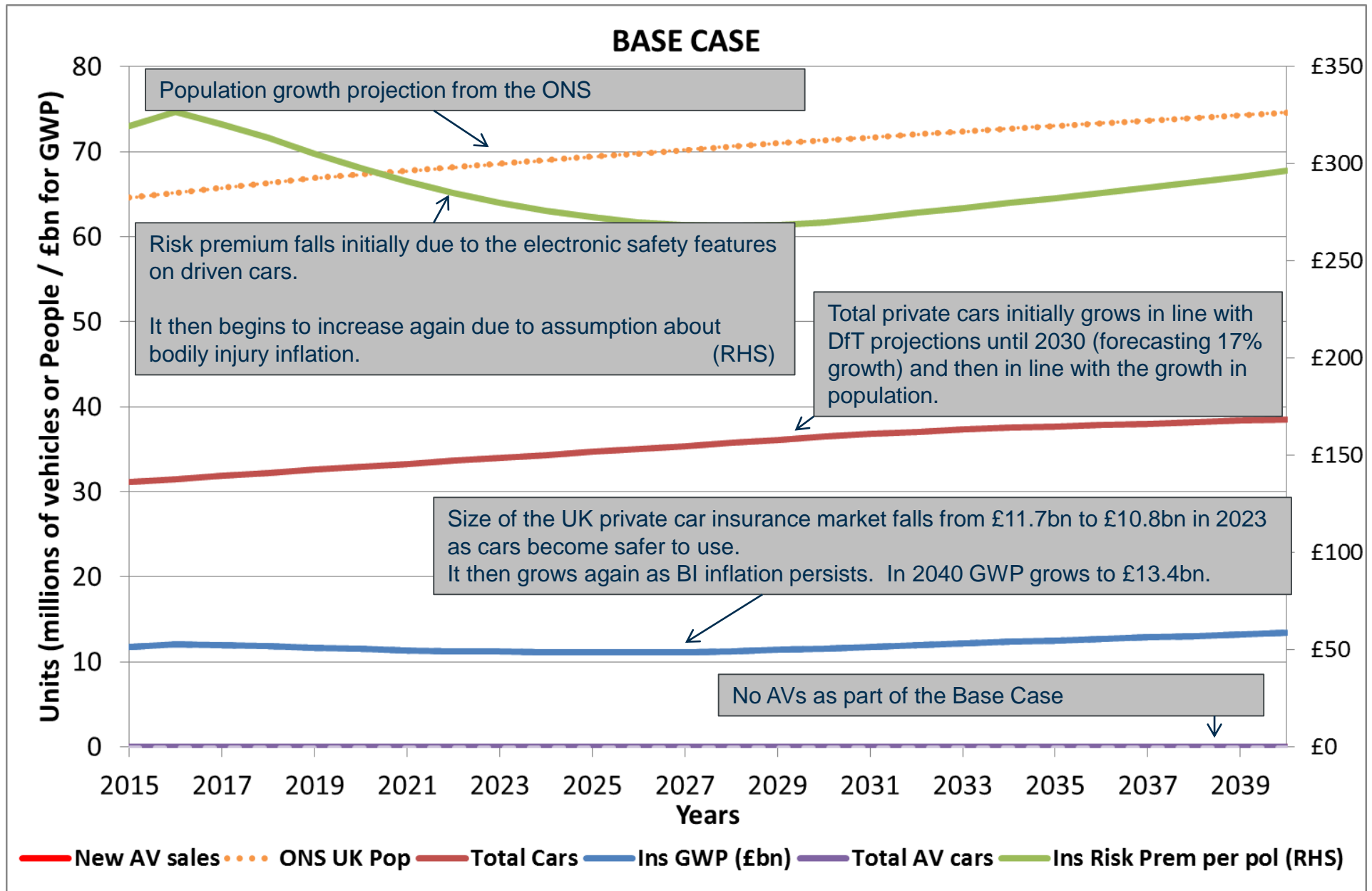
We have developed this using the following key assumptions:

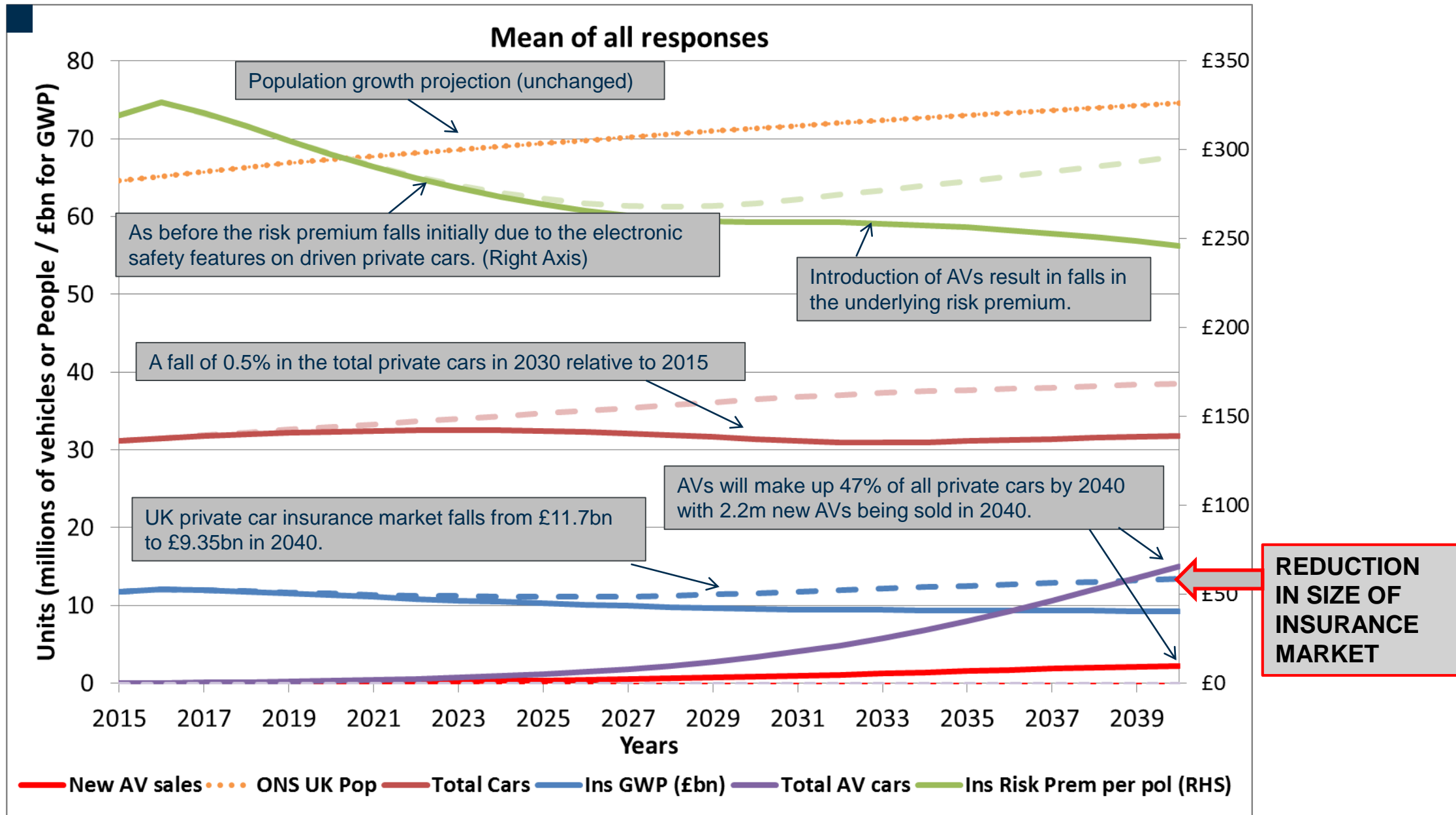
Private Car projection graph

- Number of cars on the road following DfT projections until 2030 and then follows ONS population growth forecasts
- Losses are taken from ABI market information and scaled up to cover the full population of cars
- Driven cars are assumed to improve to become 30% safer by 2030
- Long term bodily injury inflation is assumed to be 2% above inflation (higher in short term). Inflation is assumed to be 0%.

Note on Ogden Discount Rate

- In light of impending consultation that will revisit the process by which the discount rate is set, and the focus of the Bank's work on the longer-term view, we have decided not to revise our projections at this point in time.

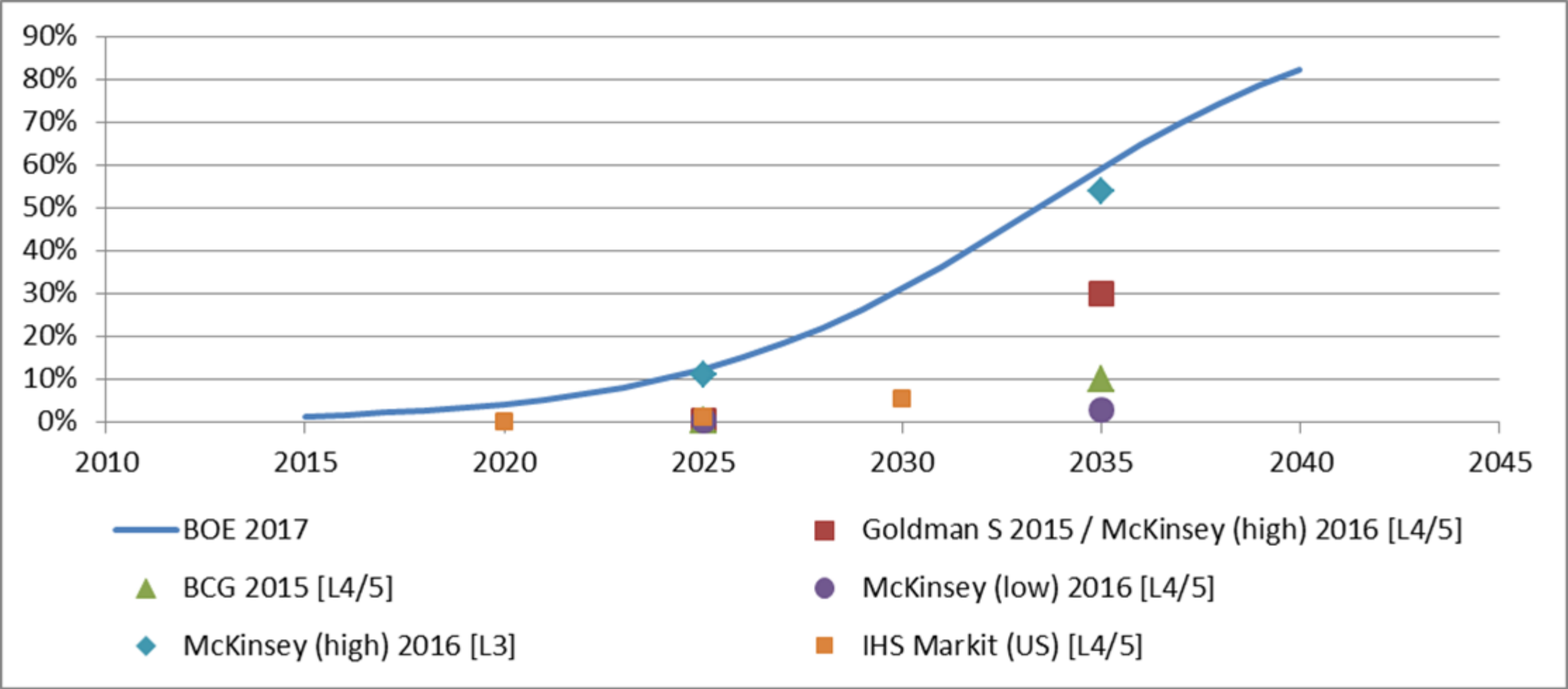




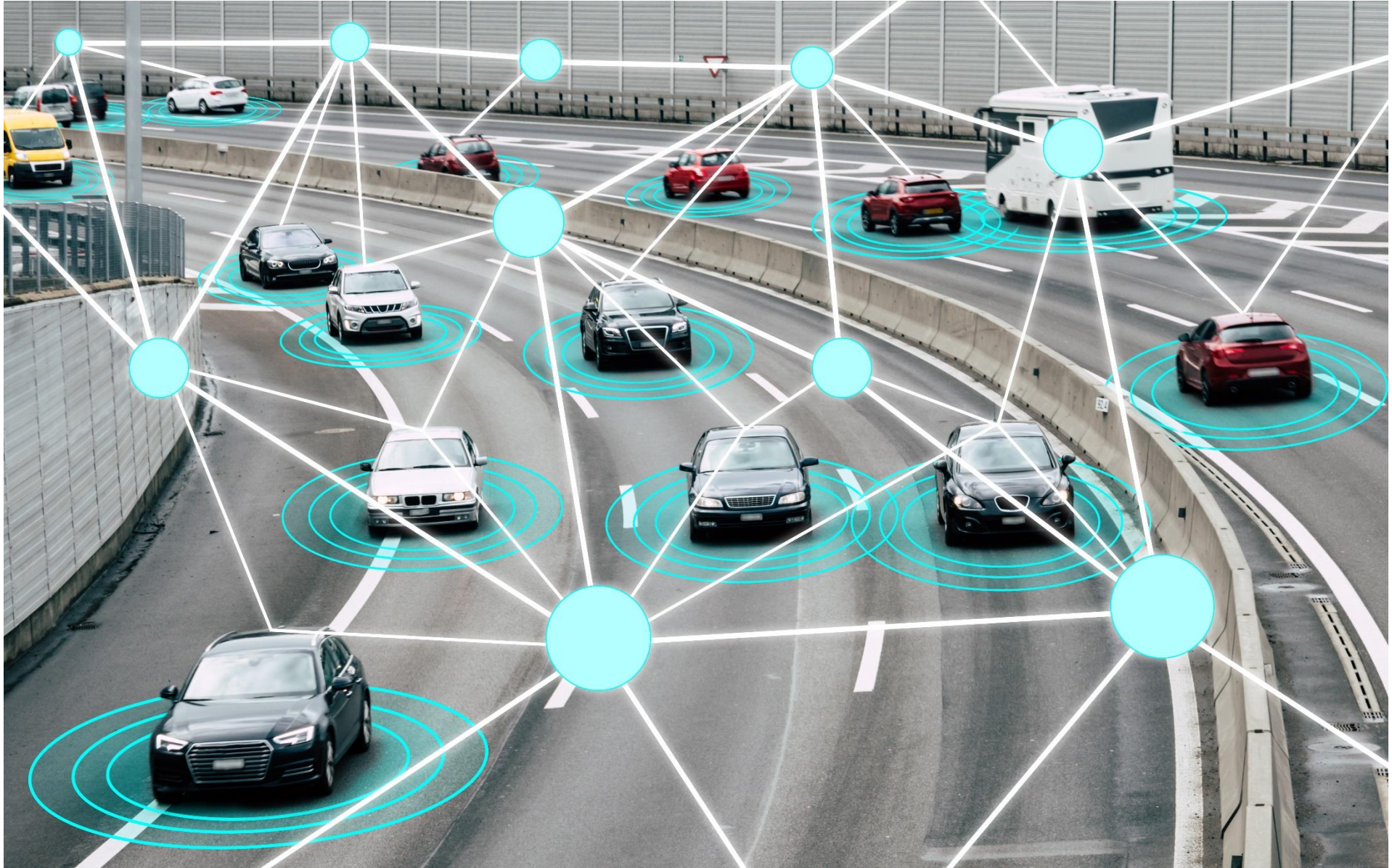
Gross Written Premium UK car – alternative projection



Other studies – Percentage of new vehicle sales are AV



Risk and Opportunities to Consider



Are insurers considering their business models?

- Admiral – “Admiral ready for the age of the driverless car as it pursues diversification strategy”

Source: <http://www.walesonline.co.uk/business/business-news/admiral-ready-age-driverless-car-12712154>

- Direct Line – Researching the possible effects of driverless cars

Source <https://www.directline.com/media/archive-2016/when-your-car-drives-itself-what-will-you-do-with-the-extra-time>

- Aviva – “In talks with driverless car developers as it faces up to the future”

Source: <http://www.telegraph.co.uk/business/2017/06/18/aviva-talks-driverless-car-developers-faces-future/>

- ABI – “Contrary to what some people might expect, insurers are not standing in the way of this development but actively looking to support progress and innovation,” James Dalton, director of general insurance policy at the ABI.

Source <https://www.abi.org.uk/news/news-articles/2016/09/autonomous-vehicles-response/>

Includes: Admiral, Ageas, Allianz, Aviva, AXA, Co-operative Insurance, Covea, Direct Line Group, esure, LV, Markerstudy, RSA, Zurich, the Lloyd’s Market Association and the Motor Insurers’ Bureau.

Where there's blame...



Liability Issues

Software and Other Updates Should they be necessary?

Mandatory?

Who is responsible for
availability/installation?

Crash Responsibility Vehicle designer or manufacturer?

Software designer or manufacturer?

Vehicle operator?

Passenger?

Jurisdiction?

Inclement Weather

Who is responsible for
inability to function in
severe weather?

Data Science



Before we wrap up...



Questions

Comments

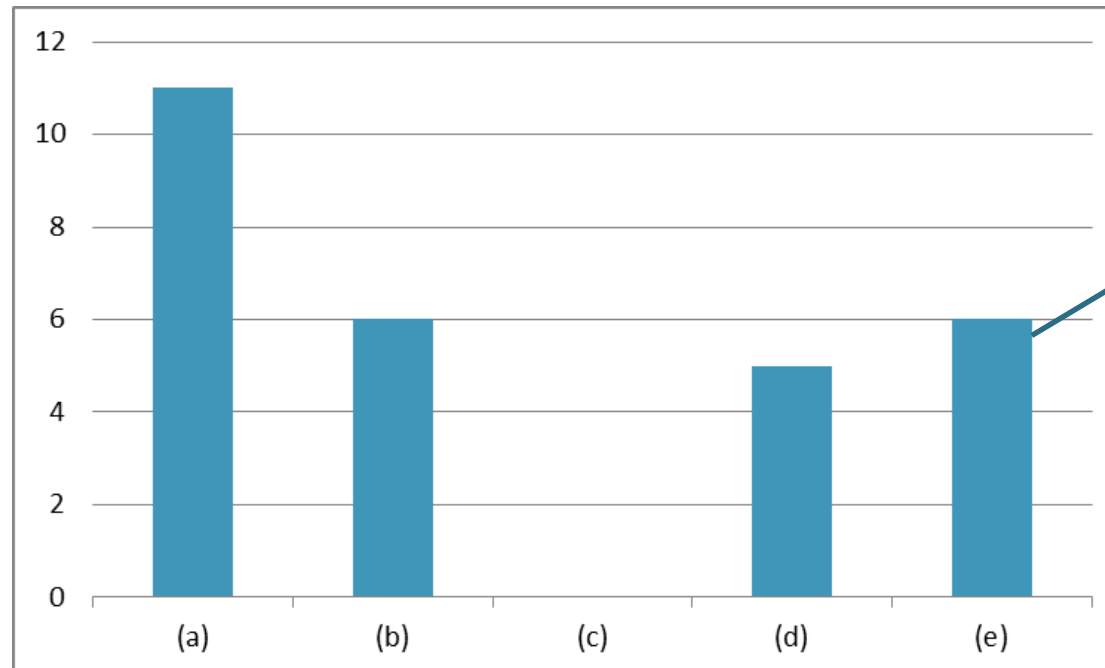
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Pre-CIGI survey results

2) To what extent has your insurer (or the insurers you work with) started to consider and define additional data requirements to help understand and analyse the potential change in risk profile?

- a) Too early
- b) There is a working group
- c) Already have a list of additional information required
- d) We are already collecting new information to track this (e.g. vehicle tech on-board)
- e) Other

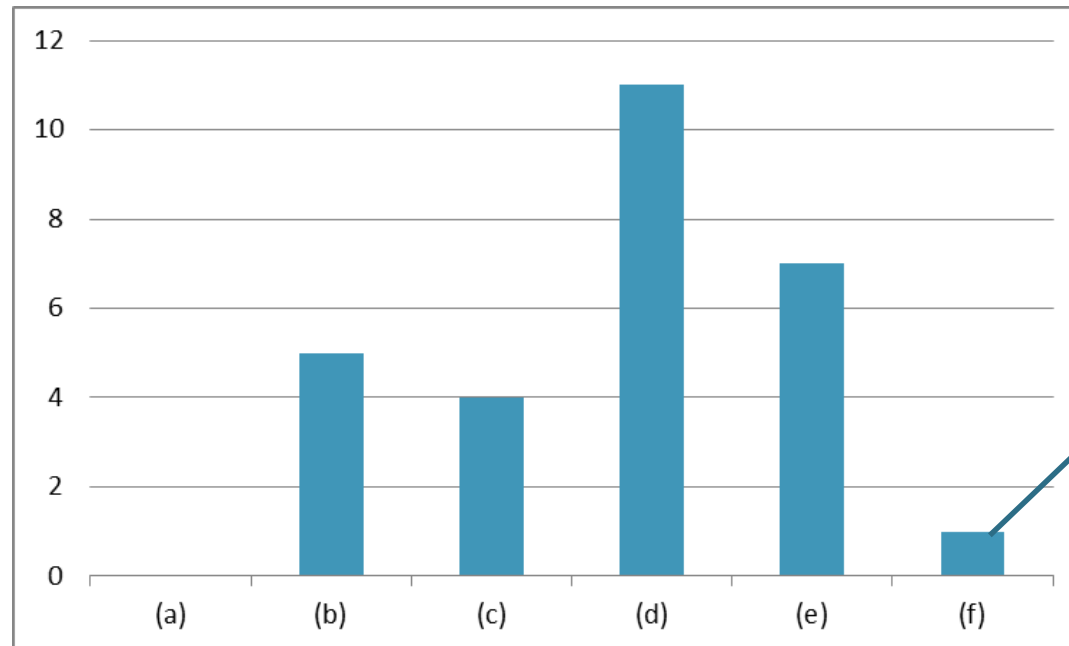


Other:
Don't work in this area (x6)

Pre-CIGI survey results

3) From an actuarial perspective what do you see as the biggest challenge relating to the emergence of autonomous vehicles in 5-10 years?

- a) Not expecting any; disruption likely to be beyond 2030
- b) Access to reliable and interpretable information
- c) Ability to have systems capable of storing and analysing the new information
- d) Ability to evaluate new sources of risk - e.g. cyber related
- e) Uncertainty created in establishing ultimate liability for claims
- f) Other

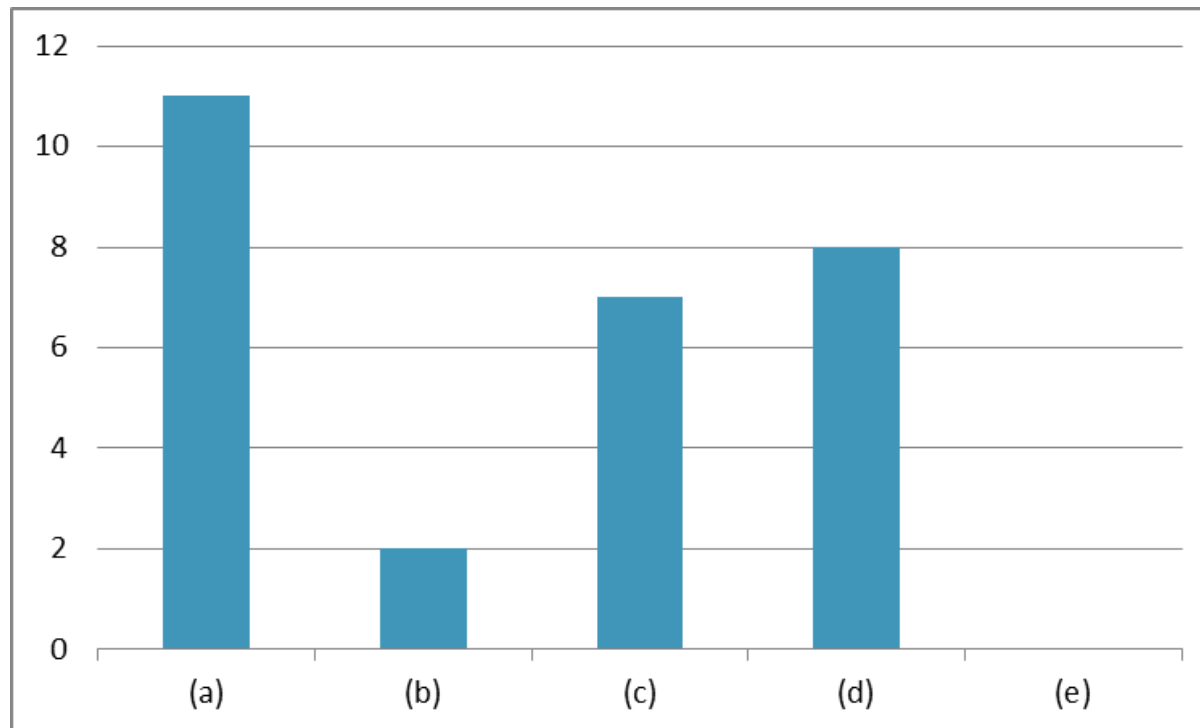


Other:
What to do with all the data

Pre-CIGI survey results

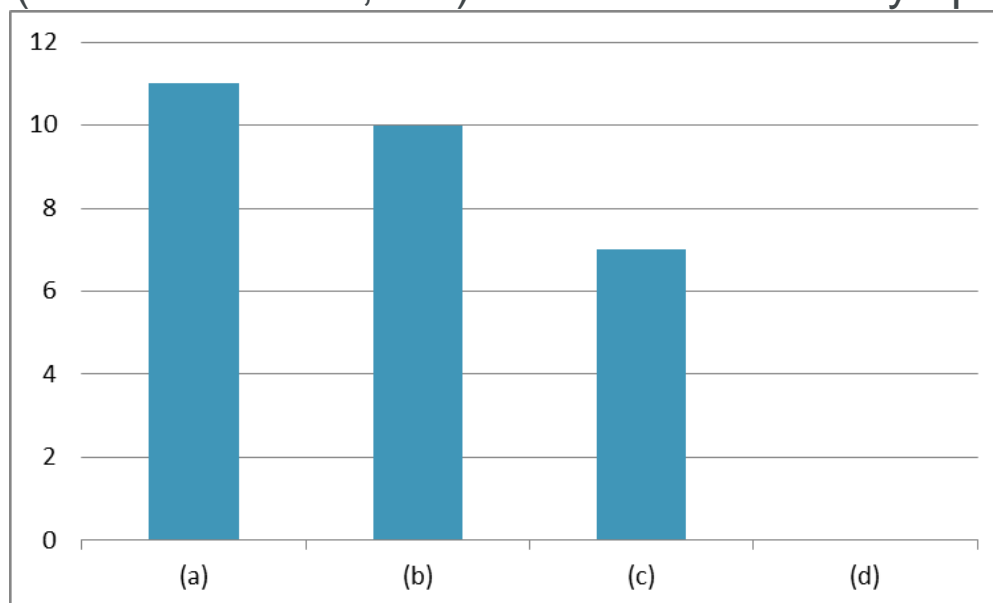
4) What do you see as the key challenge for motor insurer business models when the technology starts to become common place?

- a) Competition from non-insurance entities taking ever more of the profits out of the ins. value chain
- b) Reducing risk pool
- c) Change from personal to commercial liability
- d) Increase in systemic risk
- e) Other



Pre-CIGI survey results

- 5) How involved do you think the Bank of England should be in supporting the insurance market to prepare for new technologies?
- a) The Bank should be passive and restrict itself to challenging firms on how changes in risk profile are captured in the capital requirements
 - b) The Bank should be reasonably proactive in contributing to the debate by providing independent research
 - c) The Bank should be highly proactive, providing research but also engaging with industry and government bodies (such as the DfT, TfL) to ensure an orderly uptake of the technology
 - d) Other



Key Takeaways

- Uptake of autonomous vehicles likely to be gradual
 - but wide range of opinion
 - more rapid uptake possible
 - differing views on technological, ethical and regulatory hurdles
- Central forecast projects reduced motor insurance market
 - contraction of the UK motor insurance market of 21% by 2040.
 - but capital requirements only falling by 12%
- Insurers will need to transform their business models
 - expect future success to increasingly rely on partnerships with technology firms and manufacturers.
- BUT... will developments in electric vehicles, the social acceptability for accidents and concerns about emissions speed up the adoption of more efficient and safer autonomous vehicles?