Over-insurance – why it matters

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Introduction

An ongoing concern of governments, consumer organizations and insurance companies is that many people make unwise choices about insurance. Mostly this concern is about people leaving themselves under-insured, to their personal detriment.

When people suffer adverse events the consequences of under-insurance are clearly seen. The events themselves – car accidents, robberies, house fires – are significant for those affected. If the consequences are severe, such as loss of an uninsured house or business, they can be ruinous. After catastrophes such as floods and bushfires stories abound about hardship suffered by those who have been uninsured or badly under-insured.

By contrast there is less concern with over-insurance. That is, when consumers pay more for insurance cover than they can reasonably be expected to need on the basis of the probable value of losses. Over-insurance can take the form of choosing insurance cover for events that most consumers could easily meet from their own resources (cover for freezer contents for example) or more commonly the form of choosing "first-dollar" or 100 per cent cover, rather than taking advantage of lower-cost policies with affordable excesses or "deductibles".

While the costs of under-insurance fall on those who suffer adverse events, the costs of over-insurance are diffuse and ongoing. They take the form of regular outlays, rarely coming to people's attention (if they did, they would probably review their policies). By contrast the consequences and costs dealing with an uninsured adverse event are all too easy to recall.[1]

Also, the insurance industry itself seems to be unconcerned with over-insurance. At first sight the reason for a lack of concern may appear to be self-evident, but it is reasonable to assume that over-insurance increases the incidence of costly moral-hazard. Yet research suggests that moral hazard resulting from over-insurance is not a prime concern for the industry.[2]

Nor are governments necessarily concerned. Governments can and do "nudge" people to wise choices,[3] but whatever their ideological makeup, governments do not see it as their responsibility to stop consumers wasting their own money on products they don't need. Only in extreme cases, such as unconscionable behaviour in certain cases of "add-on" insurance products, are governments involved. Governments are more likely to be concerned with under-insurance, because when people are left in severe hardship through under-insurance there can be more call on government services and on social security payments.

There may be a case for more concern with over-insurance, however. Perhaps consumers should be "nudged" to think "do I really need that cover?" In itself the failure to ask such a question may simply mean there is a transfer from careless consumers to more savvy consumers, mediated through a (supposedly) competitive insurance industry. But over-insurance indicates a general lack of people's attention to their insurance needs, and, as is shown in this paper, behavioural biases can lead consumers to be over-insured in some areas while being under-insured in others, to their detriment.

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1. This is a specific example of what psychologists call the "availability heuristic". Our behaviour is influenced heavily by events that are easy to recall. See, for example, Kahneman 2011.

2. See, for example, van Wolferen et al 2013.

3. Thaler and Sunstein 2008.

Outline

This paper is in four parts.

> Part 1. *Homo economicus and insurance*. This is essentially a guide to the costs and benefits of insurance in money terms – the terms of the "rational" consumer, unaffected by behavioural biases. It assumes that people are capable of understanding risk, that they can perform simple calculations, that their considerations of well-being are in monetary terms, that they assign the same value of money to gains as they do to losses, and that any risk or loss aversion is due to "rational" considerations of wealth and liquidity constraints.

> Part 2. *Abundant insurance – we're wealthier but not self-insuring*. In spite of rising household wealth and very much lower real prices for motor vehicles and other goods that people normally insure, there is no strong evidence to suggest that people are taking advantage of these trends to lessen their dependence on insurance, for example by taking insurance with higher excesses.

> Part 3. *Behavioural biases in over-insurance*. This is about how people actually make insurance decisions, explaining in large part why over-insurance is so prevalent. It draws on the work of Howard Kunreuther of the Wharton School, who in turn draws on the work of behavioural economists, particularly Daniel Kahneman and Amos Tversky.[4] It also draws on other published research that expands on Kunreuther's work. People are subject to biassed modes of thinking – quick decisions or dependence on simple heuristics – that lead them to make sub-optimal decisions.

> Part 4. *Public policy on over-insurance*. This concluding chapter suggests that governments and consumer organizations should pay more attention to over-insurance, both in terms of general welfare and in the context of helping consumers, who are subject to behavioural biases and under pressure from insurers' commercial incentives, to make more considered choices.

This paper covers only what is known as "general" insurance, mainly house, vehicle and contents insurance. It does not cover health insurance, which is subject to its own set of specific regulations and incentives, and nor does it cover life, disability and public liability insurance, which tend to operate in a different legal and regulatory environment from general insurance.

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4.   Kunreuther 2013, Kunreuther and Pauly 2015, Hogarth and Kunreuther 1991, Kahneman and Tversky 1979, 2000, Kahneman 2011.

1. Homo economicus and insurance

Homo economicus is a fictitious species of intelligent primate which always acts in line with what economists call "rational choice theory". They are adept at calculation and always make prudent and logical decisions to maximise their personal benefit. They are in no doubt about their preferences and can easily decide between different options among available choices.

Although the species is fictitious, its behaviour in responding to financial incentives provides the basis for economic models of how people behave in markets, and tends to guide public economic policy. At a macro level "rational choice theory" has reasonably robust predictive and explanatory power (but it fails to explain behaviour in many specific markets). It also forms the basis for economic theories of corporate behaviour: corporations are expected to seek profit maximisation as a single objective (but in reality corporate behaviour is much more complicated).

This part of the paper considers how homo economicus, the "rational" consumer, would carefully consider his or her need for insurance, and avoid over-insurance (or under-insurance). As will be seen in Part 2, evidence suggests, however, that even while household wealth has been increasing and as goods have become cheaper, people are still over-relying on insurance to their financial detriment.

An idealised insurance model vs the real world

Regardless of whether one is risk-averse or risk-seeking, there are possible events which would have ruinous consequences, and for which most people seek some pooling of risk, either through private firms (insurance companies) or governments. People vary in their capacity and willingness to bear small losses (that's where risk-aversion comes to play, covered in Part 3), but most people seek cover for events involving large losses.

In practice however, open-ended insurance cover for catastrophic loss is not available. The contract to insure involves a limited liability on the part of the insurer. In the following two dictionary definitions of "insurance" note the term "*specified* loss":

> Oxford: "An arrangement by which a company or the state undertakes to provide a guarantee of compensation for specified loss, damage, illness, or death in return for payment of a specified premium."

> American Heritage: "A contract binding a company to indemnify an insured party against specified loss in return for a premium paid."

That specification can be for defined events (vehicle accidents, fire), for dollar limits on cover (defined value, replacement), or both. In most policies the insurer limits its cover, even for some large open-ended risks, such as personal public liability (typically with caps of $10 million to $20 million). Practically such caps are inevitable: no insurer, public or private, could possibly cover reconstruction after a nuclear war for example.

Figure 1 shows the difference between what the "rational" consumer may need and what insurers offer. The consumer has some capacity and willingness to bear some risk personally (the lower blue zone) but seeks cover for open-ended risk (the red zone). What insurers offer,

however, differs, in that the insurer caps its own cover, leaving the consumer to bear the open-ended risk.

For many classes of insurance and for most claims, the residual open-ended risk borne by the consumer is bearable. If my car is written off in an accident and I am disappointed by the insurer's payment, the difference I have to pay to restore my mobility is generally bearable.

In some cases of house insurance, however, the residual can be significant, as happened in the 2003 Canberra fires, when, because of the widespread nature of the fires building trades were in short supply and the government set new and more costly standards on re-building.
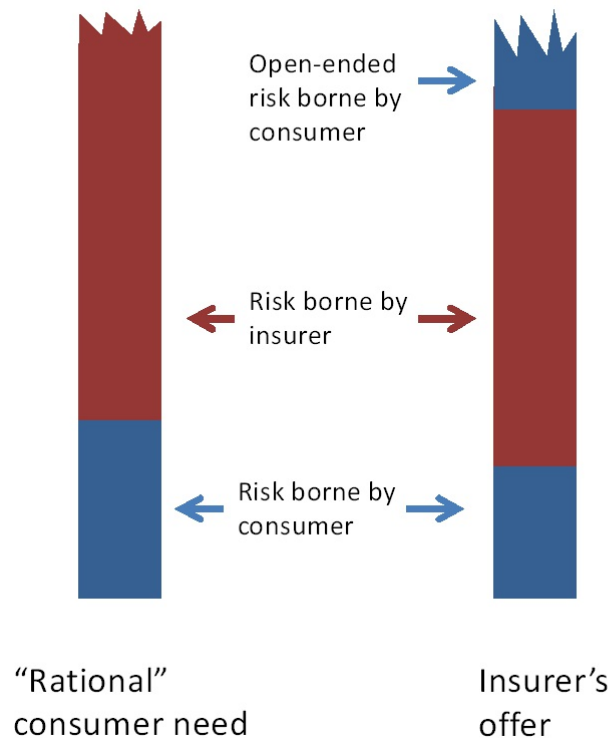
Such involuntary under-insurance is an important issue in insurance, but this paper is specifically concerned with over-insurance. Its inclusion in this paper illustrates the point that even within one policy a consumer may be both under-insured and over-insured. That is, under-insured at the top end, where the consumer may be bearing to much open-ended risk, and over-insured at the bottom end, where the consumer is paying the insurer to bear risk that he or she could easily afford to cover.

Figure 1. Consumer's need and insurer's offer

Open-ended risk borne by consumer

Risk borne by insurer

Risk borne by consumer

"Rational" consumer need

Insurer's offer

Over-insurance has two general forms. One is when consumers buy insurance to cover risks which they could cover from their own resources, for example when a well-paid young professional with few personal possessions takes house contents insurance. The other is when consumers fail to take advantage of lower-priced policies where they can opt to pay an excess (the lower blue zone in the diagram) before insurance kicks in. In general the discounts for such risk-sharing are significant, and in terms of people's resources the excesses are generally modest, but many consumers, including those who are well-off and could afford the excess, take policies with low excesses or even "first-dollar" (zero excess) cover.

The simple equation

For the "rational" consumer, the decision to insure should be guided by a conceptually simple equation (or more strictly an "inequality" rather than an "equation"). That is:

> "Is the expected cost of an adverse event greater than or less than the premium I will pay?"

There are various ways of presenting that decision rule, but it generally comes down to comparing the annual premium to the probability of an adverse event multiplied by the cost incurred by such an event happening.

Thus, if the cost of replacing my possessions is $100 000 and there is a one in fifty (2 per cent) probability of my suffering their complete loss through theft or destruction in any one year, then what is known as the *expected cost* [5] of those adverse events is $2 000 a year. My "rational" threshold decision would be to take any policy costing $2 000 or less, and to self-insure (i.e. to be prepared to pay the $100 000 out of my own pocket) if the price is higher. A premium so calculated is sometimes known as an *actuarially fair premium*.

There are two problems with this simple equation, however. First, I may not have a spare $100 000 lying around in my liquid reserves. And second, no insurer is going to offer me such a deal, because insurers have to be paid for the service they provide. The next two sub-sections deal with these two complications of insurance, starting with the cost of insurance.

Insurance is costly

Insurers incur administrative costs and like any business must make a return on funds employed. On average, out of every $100 received in premiums, general insurers pay out only around $60 in claims. For houseowners'/householders' insurance the payout is $58 per $100 premium; for domestic motor vehicle insurance the payout is $75 per $100 premium.[6]

Insurers refer to percentage of their premium income that they pay out in claims as their "loss ratio". The loss ratio for houseowners'/householders' insurers is 58 per cent, and for motor vehicle insurance it is 75 per cent, in line with the figures above. The balance, 42 per cent for houseowners'/householders' insurers and 25 per cent for motor vehicle insurance, covers their administrative expenses and profits. Insurance is expensive, and by implication, over-insurance is expensive.

Coming back to the example above, that means in a well-informed market there won't be a $2 000 or lower-priced policy to cover a $2 000 expected cost of risk. Again, assuming the market is competitive and that there are no excess profits, the price for such a policy will more probably be in the order of $3 500 (that is $2 000 ÷ 0.58, the net loss ratio for householders' insurance).

Yet in spite of such inherent poor value, most people still insure: 94 per cent of Australian households have house insurance and 71 per cent have contents insurance.[7]

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5. Often the term "expected value" is used, but because the term "value" has specific meaning in economics, and because insurance premiums are costs, the term "expected cost" is used in this paper.

6. These figures are net loss ratios, published in APRA's Quarterly General Insurance Performance Statistics, March 2018.

7. Tooth 2015.

One reason for this high uptake of insurance, although it would account for only a tiny proportion of policies, is that some people calculate that they can profit from taking insurance because they believe their particular risk profile to be higher than that calculated by the insurer, which is inevitably calculated on some average.

When the heightened risk is not related to the behaviour of the insured, such a choice is known as *adverse selection*. For example, in Australia, in spite of all the incentives to make younger people take up private health insurance, because health care costs rise steeply with age, private health insurance, on average, becomes a value proposition only once people reach the age of 55. Health insurers recently have been losing members under this age while gaining roughly the same number of older members.[8] That's adverse selection at work, and if health insurers were not so heavily regulated they would probably apply higher premiums for older members.

When the heightened risk is because of the behaviour of the insured, such a choice is known as *moral hazard*. That is when I use insurance to cover for my own carelessness. While some people may insure because of their own known carelessness (or, in extreme cases, deliberately to defraud insurers), moral hazard usually operates in the opposite direction: knowing my assets are insured I may take less care in looking after them. For example, I may be less careful about finding a well-lit and well-trafficked location to park my car if it is well-insured than I would if it were not insured.

Insurers take steps to avoid adverse selection and moral hazard, through data analysis and through incentives such as no-claim bonuses for car owners. But because such data collection and analysis is costly, and because it runs up against legal privacy protections, insurers can never eliminate adverse selection and moral hazard. In any event the gains from such strategic behaviour by consumers have to be substantial to overcome the premium consumers have to pay to cover the insurers' costs and profits. As a calculating consumer I have to be engaged in very risky behaviour to be able to profit from adverse selection or moral hazard.

It is likely that adverse selection and moral hazard give some people some incentive to hold insurance, or to hold more insurance than they would otherwise have chosen, but such incentives are unlikely to be powerful enough to become the sole deciding factors for people to hold insurance. (If they were insurance would surely be unsustainable as a business model.) As will be shown in Part 3, such strategically "rational" calculating consumers are rare. But it is probable that adverse selection and moral hazard are part of the reason why insurers incur high costs.

The other point about adverse selection and moral hazard is that insurance is an almost unique product in that, unlike most products for which suppliers have better knowledge than consumers, many consumers have better knowledge than suppliers. We might expect the "rational" consumer, when considering whether to take up insurance, to be mindful of the probability that he or she may have to cross-subsidise those whose claims may be higher, but there is little evidence that consumers think that way.

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8.   For calculation of the 55 cutoff age, see McAuley 2005. For movements in membership see APRA Private Health Insurance quarterly statistics.

The (slightly) more complex equation – wealth and liquidity

The main "rational" reason for holding insurance is that when it comes to risks with very costly consequences, such as destruction of one's house, most people lack the means to replace such assets – or even if they have the means their funds may be committed to other purposes such as retirement or they may not have the liquidity.

Table 1, drawn from the latest available Bureau of Statistics data, shows various indicators of households' assets, by wealth quintile.

Table 1: Net worth of households by wealth quintiles, $'000, 2015-16

	Lowest 20%	Second	Third	Fourth	Highest 20%	All
All assets and liabilities	37	235	528	950	2 906	929
Excluding own dwelling	22	54	125	357	1 818	473
Excluding own dwelling and superannuation	5	-16	29	168	1 249	285
Liquid financial assets	7	21	28	54	138	49
Liquid financial assets plus superannuation	24	91	124	244	707	238

Source: Derived from ABS Household Income and Wealth, 2015-16, Cat 6523.0. "Liquid financial assets" taken as ABS "Value of accounts held with financial institutions".

By these figures, assuming replacement of a house and contents would cost at least $300 000, somewhat fewer than 40 per cent of households would have the means to finance such replacement from their own assets. If superannuation is excluded from people's available assets, only the wealthiest 20 per cent of households would have such means. (Drawing on superannuation is permitted for those who are in retirement phase or who can demonstrate severe financial stress.)

Liquidity is important, and most people, even if they are wealthy, don't have much cash at call, as the bottom two lines of the table show. If superannuation is excluded, then at this broad scale no wealth group would have the liquid assets to cover even a $200 000 loss.

Liquidity comes at a price to consumers, that price being the opportunity cost of holding assets in low-return deposits such as bank accounts (which, after inflation and taxation, almost always yield negative returns). The opportunity forgone of holding such liquidity is the return on higher-yielding assets, such as shares or investment in one's own business – or for those who lack net assets, the cost of borrowing to replace assets, assuming such funds are available.

For most consumers therefore insurance against catastrophic events is quite "rational". For the consumer lacking enough wealth or access to borrowing to cover a catastrophic loss, self-insurance is not an option.

For the wealthy consumer who does have the means to self-insure, even though purchasing insurance is statistically a poor value proposition, the net cost of insurance – the difference between the premium and the expected cost – can be seen as payment for access to liquidity. Also it is a protection against what may be called a "change of state", where after a

catastrophic event one's situation changes from having a comfortable buffer of wealth to living closer to the edge. Some may call this "risk aversion", but it is different from what behavioural economists call "myopic risk aversion" or "myopic loss aversion"[9] which occurs when people consider risks in isolation rather than in the framework of their total wealth, a bias to be covered in Part 3.

There is some evidence of such "rational" behaviour in relation to house insurance. Research cited by PIRAC Economics shows that those who own their homes outright are more likely to be uninsured than those who are mortgagees, and that holiday houses and rental properties are more likely to be uninsured than people's own residence, but the effects are small.[10]

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9.   Benartzi and Thaler 1995.

10.   PIRAC Economics 2017.

2. Abundant insurance – we're wealthier, but not self-insuring

With increasing wealth and with lower costs of insurable assets we may be expected to turn to more self-insurance, but there is little evidence to suggest that this is happening.

Table 1 showed a snapshot of average wealth in 2015-16. Table 2, below, shows how, in real (CPI-adjusted) terms, household wealth in all categories has increased over the ten years to 2016. Net household wealth increased by 28 per cent, and wealth in the form of liquid financial assets increased even more – by 54 per cent.

Table 2: Average net worth by household, $'000, 2005-06 and 2015-16 in 2015-16 prices

|	2005-06	2015-16	Increase
All assets and liabilities	728	929	28%
Excluding own dwelling	358	473	32%
Excluding own dwelling and superannuation	249	285	15%
Liquid financial assets	32	49	54%
Liquid financial assets plus superannuation	141	238	68%

Source: 2015-16 figures as for Table 1, 2005-06 figures from ABS Household Wealth and Wealth Distribution, Cat 6554.0, indexed upwards by CPI change over period.

Over the same period, while the cost of repairing or re-building damaged houses has not fallen, prices of many assets people insure in their contents policies, or which they insure separately, such as cars, have fallen heavily. Figure 2 shows how on average the real (inflation adjusted) price of selected items has changed over the last twenty years.

It covers only those items which are clearly identified in the Bureau of Statistics consumer price index and which people tend to include on contents policies. It includes floor coverings (no significant fall), tools and garden equipment (30 per cent fall), small appliances and cars (50 per cent fall) and audio, visual and computing equipment (for which prices have tumbled).

It excludes certain important commonly-insured items, such as jewellery, keepsakes, works of art and other collectible items. And it's important to note that for some goods (most specifically computers) the Bureau of Statistics statisticians try, with limited success, to discount improvements in quality over time.

In 2018 consumers probably have more and better quality cars and household goods than they had in 1998, and larger houses to put them in, which means that falls in Bureau of Statistics index numbers would overstate falls in consumers' outlays. It would be an overstatement therefore to suggest that because prices have fallen by X per cent people need X per cent less insurance.

Figure 2: Prices of selected items relative to "all groups" CPI -- base March 1998 = 100
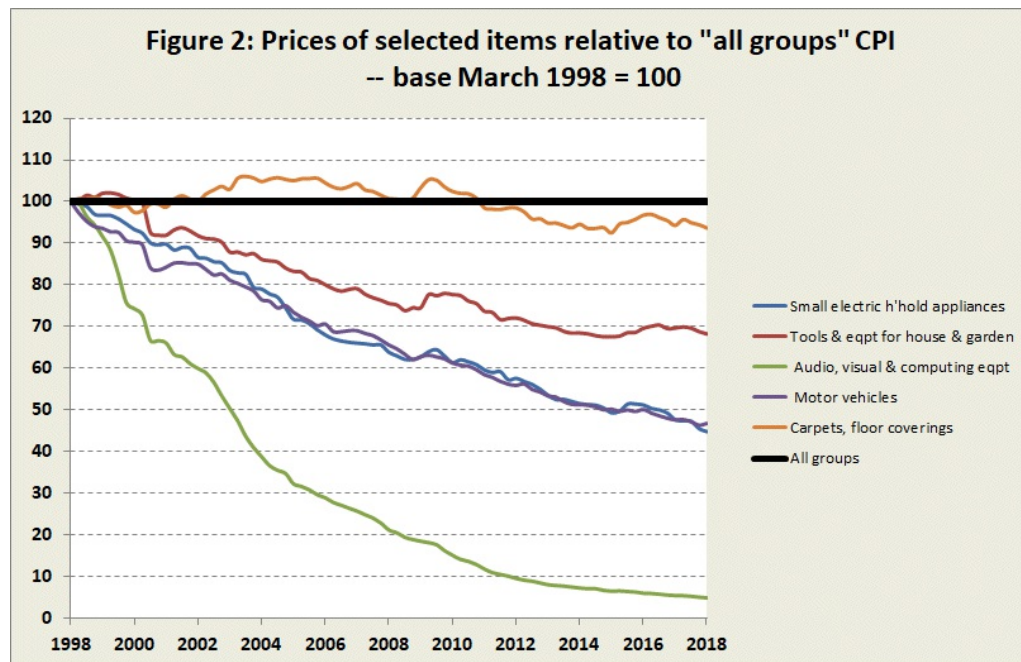
Any suggestion that we need more insurance because we are buying higher-quality and more expensive goods, however, needs qualification. As a "rational" consumer my desire is not to replace the very goods I may have lost: rather it is to restore the services I have enjoyed from those goods, and with most goods with a range of related prices and qualities the more I pay the less is the marginal extra benefit I enjoy from having paid more. As a report prepared for the Insurance Council acknowledges "people may self-insure contents to an extent by replacing lost or damaged contents with lower-quality items or forgo replacing some items."[11] (When it comes to electronic goods and appliances the replacements I buy may be both lower-priced and higher quality.)

For example I may have an upmarket camera that would cost $4000 to replace, but I may work out that I can get 90 per cent of the benefit of that camera from a $2000 replacement camera. Even if my means are limited, self-insurance may still be an attractive option if I calculate that I would pay dearly for that extra cover for a small amount of restored utility.

Another factor to take into account is that people are increasingly able to reduce the risk of theft with improved household security. Apartments in particular are becoming more secure. Investment in security can be seen as an aspect of self-insurance.

So in spite of higher wealth contributing to people's having more insurable assets it is reasonable to expect that increasing wealth and lower prices would dent people's demand for insurance.

There is only weak evidence, however, that people are opting to self-insure, or to choose policies with high excesses (assuming they are available).

There are only scraps of Australian evidence from which some tentative conclusions may be drawn. A 2017 survey by PIRAC Economics found that young people living in apartments are

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11.   Tooth and Baker 2011.

less likely to hold contents insurance than the general population,[12] but this may simply reflect the fact that young people have not accumulated many possessions.

The same survey found that people in households of low net wealth (less than $124 000) were significantly *less* likely to hold contents insurance than the general population. This finding goes against any suggestion that the higher one's wealth the more likely one is to self-insure.

In a report specifically concerned with how taxes affect the demand for insurance Sapere Research group cited international data on the price and income elasticity for home insurance.[13] That is, data showing how demand for insurance may vary with price and income.

Unsurprisingly they found a range of estimates of price elasticity of demand. They were all negative, meaning that the higher the price of insurance the less people buy – a finding common to most goods. They also found that after controlling for the value of contents there was very little income elasticity of demand. (Potatoes have low income elasticity of demand, BMW cars have high income elasticity of demand.) That suggests that the only way in which income influences the demand for insurance is that people with higher income have more valuable assets: higher income does not reduce people's demand for insurance.

But they did find that households with higher wealth were less likely to insure, supporting the possibility that wealthier people were possibly more likely to self-insure. This may be because they take into account not only their capacity to replace assets, but also their investments in security and the comparative safety of the areas where they live.

These different findings on income and wealth are not incompatible. Income does not necessarily correspond with the financial liquidity one needs to replace damaged or destroyed assets. Many households live with little liquidity. A 2014 survey by Wesley Mission in New South Wales found that of households surveyed 23 per cent said they could not meet an emergency payment of $2 000.[14] Even among the 60 per cent of respondents who did not consider themselves to be financially stressed, only half said it would be "easy" to make such a payment. The Sapere survey referred to above found that five per cent of households "could not raise $2 000 emergency money in a week" – a lower result than suggested by Wesley, but it also found that 35 per cent of households could not finance such a payment from their own savings.

Nevertheless it reported that 79 per cent of those who *could* raise $2 000 from their own savings had contents insurance, a higher proportion than the population at large (71 per cent). It also found that households with an older "reference person" were more likely to hold contents insurance: 80 per cent of households with a reference person over 55 had contents insurance, even though Bureau of Statistics data on wealth shows that wealth, including liquid wealth, increases with age.

In short, there is no Australian evidence to suggest that with regard to contents insurance there is any movement towards more self-insurance.

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12.   PIRAC Economics 2017.

13.   Tooth 2015.

14.   Wesley Mission 2015.

Missing from these surveys is any indication of the use of excesses. Even if people are still buying contents insurance, are they taking advantage of the availability of discounts for excesses?

A 2010 study by Justin Sydnor of the Wisconsin School of Business, using data from a large US homeowners' insurance company, found that most consumers purchased policies with low excesses despite those costs being significantly above their expected value – that is the probability of claiming multiplied by the benefit of a low excess. He found "that, on average, the customers who purchased lower deductibles [excesses] paid five times more in additional premium than the extra insurance was worth".[15]

Similarly in experimental conditions among respondents from six European countries, 59 per cent of respondents tended to select policies with too low an excess given their financial means. The results by country are revealing: 63 per cent of Italian and Swedish respondents chose a too-small excess (i.e. they could have saved money by taking policies with a higher excess), while respondents from Romania and Slovakia, much poorer countries, were more likely to err on the side of taking too high an excess in relation to their means.[16]

Kunreuther summarises behaviour in relation to deductibles (excesses):

> People who purchase low deductibles appear to overpay to buy protection against losses that are quite small that they could easily cover with payments out of pocket. … Nonetheless, low-deductibles are popular, with a commonly used strategy of purchasing the lowest possible deductible offered by the insurer.[17]

In sum, empirical evidence concerning the use of self-insurance, either in terms of not-insuring or of not making wise use of excesses, is inconclusive, but it does not support the proposition that consumers are taking a "rational" approach to purchasing insurance.

The next part considers explanations for over-insurance. These are mainly taken from the findings of behavioural economics.

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15.   Sydnor 2010.

16.   European Commission 2017, p.183.

17.   Kunreuther et al 2013, p. 119.

3. Behavioural biases and over-insurance

Insurance is a gamble, and as with other forms of gambling the house takes its share. In some forms of gambling, such as horse racing, a few well-informed participants can beat the odds, the equivalent in insurance being those who benefit from adverse selection and moral hazard as described in Part 2, depriving the house of its share.

Most people who take insurance, however, contribute to the house's share, and that's generally a large share – much larger than the share taken in regulated gambling. The loss ratios – i.e. the returns to consumers – in general insurance are in the order of 60 to 75 per cent, as shown in Part 1. Those returns are significantly lower than the equivalent "return-to-player" percentages in regulated gambling. Poker machine returns are in the order of 85 to 90 per cent for example.

Insurance has two significant differences from other forms of gambling. First, people place their bets on insurance infrequently, typically once a year. No one becomes addicted to insurance, as they do with short-cycle gambling, although, as is suggested further on in this part, insurance can be habit-forming. Second, while most forms of gambling involve specified outlays to enjoy probabilistic benefits, insurance involves specified outlays to avoid probabilistic losses, and our behaviour is not symmetrical with regard to benefits and losses.

In Part 1 it was shown that insurance covering catastrophic losses fits with economic models of "rational" behaviour. People are rationally prepared to pay a premium over expected cost (the actuarially fair premium) to protect themselves from losses that would have devastating effects on their life, and they are willing to pay a third party to have the liquid funds to cover those losses, because holding liquid funds involves an opportunity cost for consumers. But there are also observed behaviours showing that many people pay a premium to avoid losses that they could easily cover from their own resources, either by not insuring at all, or by choosing lower-cost policies with high deductibles.

One frequently-used explanation for such apparently "irrational" behaviour is that people are risk-averse. That is, we pay a premium to avoid risk, but this is too simple an explanation. Seventy per cent or more Australians participate in gambling and around a third of Australians have shares in stock-exchange listed companies.[18] Both activities indicate acceptance of some level of tolerance to risk. If risk-aversion is more prominent in insurance than other domains of our lives there must be some other explanations, and they may not necessarily be related to risk-aversion in the general population.

The findings of behavioural economics, many of which are about decision-making in situations of uncertainty, shed some light on such behaviour. In contrast to the assumptions of consumer "rationality" upon which many economic models are built, behavioural economics studies how consumers actually make decisions, particularly in situations of uncertainty or risk (a sub-discipline known as "prospect theory"[19]).

Although behavioural economics has emerged as a discipline only in the last thirty years or so, there is nothing particularly novel about it: Adam Smith identified many departures from

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18. Productivity Commission 2010, Australian Stock Exchange 2015.

19. Kahneman and Tversky 1979.

"rational" economic decision-making,[20] macroeconomists recognise the influence of "animal spirits" in the business cycle, and marketers and advertisers play on our "irrational" vulnerabilities. The comparatively recent emergence of behavioural economics as a separate discipline means, however, that there is no clear taxonomy used by behavioural economists. The reader of this part, therefore, may find other terminology in other sources.

Risk and uncertainty – similar but different

In everyday language the two terms are used interchangeably, but there is a difference and it is more than semantic.

"Uncertainty" is a broader term than "risk". Various definitions of "uncertainty" abound but they generally have to do with an unknown future. "Risk" is more about known probabilities, and if I must make a decision in situations where probabilities are known, then I can rationally perform calculations of expected cost – the probability of an adverse event multiplied by the probability of an event as described in Part 1. Such a calculation is the first step in risk management.

If I'm playing roulette I'm obviously uncertain about whether the next spin will be odd or even, but I can assign a probability to that outcome: I know and can quantify the risk. Thanks to the skill of weather forecasters and their databases I have a reasonably good idea of whether it will rain tomorrow, but I cannot be so sure about assigning a probability as I can to a roulette wheel. I may be fastidious enough to dig through crime statistics and calculate the probability of a burglary in my state, but those figures are historical: they may not apply to my particular area for example. While many texts suggest there is a clear distinction between situations of uncertainty and situations of risk, in reality the distinction is one of degree.[21]

The "rational" approach described in Part 1 is most relevant in situations economists would describe as "risk", where probabilities are known. From the perspective of insurers, some probabilities are reasonably well-known. Using historical data they can take a risk approach to providing cover against automobile accidents, lost luggage on flights and on many other areas where probabilities can be calculated, losses are limited and no shocks to the system are on the horizon. But when it comes to events such as a terrorist attack, although everyday language may refer to the "risk" of such an attack, there is too much uncertainty to be so categorical – it's a situation where both the probability and the consequences are subject to large uncertainty and the idea of an actuarially fair premium becomes almost meaningless.

In areas of high uncertainty it is difficult for either the insured or the insurer to make a "rational" assessment of probabilities. That's one possible explanation why the insurers' loss ratios on automobile accidents are generally higher than they are on house insurance, particularly in providing cover against weather-related events. With the uncertainties around climate change, traditional risk models, such as the "100 year flood" based on historical records, may be becoming less useful.

Robin Hogarth and Howard Kunreuther found that the price of insurance is considerably higher when probabilities are ambiguous than when well-specified, and they noted several

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20.   Ashraf et al, 2005.

21.   For a comprehensive cover of risk and uncertainty see Bazerman 1998.

areas where insurers were reluctant to provide cover because of uncertainty, including day-care centres, medical malpractice, asbestos removal, commercial fishing boats and local governments.[22] In Australia cover for flood damage has been similarly problematic.

Most of the areas identified by Hogarth and Kunreuther are in areas of commercial rather than consumer insurance, but their work illustrates the general point that insurance is most easily fitted to situations of known risk, rather than to areas of uncertainty.

Hence, in areas of high uncertainty, where there are no neat probabilistic equations, it is less possible for researchers to be sure, *ex ante*, if consumers are under-insuring or over-insuring. Evidence of persistent low loss ratios could indicate a degree of over-insurance, but such broad evidence is not of much help even to the most rational consumer deciding whether to take a policy for future contingencies.

That doesn't mean, however, that consumers cannot make wise choices in such situations. For many events, even if the probabilities are unknown, the consequences may be reasonably clear. I may not be able to know the probability of my car being stolen or involved in an accident, but I have a reasonably good idea of what it would cost to replace. Also, I know my liability in the event of a claim, and should be able to make a wise choice in relation to the tradeoff between the price of the policy and the excess I may pay in the event of an accident or theft.

Difficulties in dealing with probability

Even when probabilities are known, as is the case with laboratory experiments in behavioural economics, where participants are given clear odds and the stakes are low or hypothetical, many people make unwise choices. Research on gambling, such as that brought together in the 2010 Productivity Commission Report on Gambling, shows that many people have only a hazy understanding of probability.[23]

When it comes to events with very low probability, most people find it difficult to distinguish between probabilities such as 1/100 000 and 1/10 000, even though they differ tenfold. This leads to a subjective over-weighting of low probabilities in people's decisions to buy insurance. As Kahneman and Tversky point out, "overweighting of low probabilities may contribute to the attractiveness of both insurance and gambling".[24]

In fact some research suggests that this bias starts to take effect not only at very low probabilities, but even in probabilities as high as 1/3.[25] I may be able to deal with a one in two probability on the toss of a coin, but when it comes to a one in four probability – in a game of two-up perhaps – my judgement may become blurred.

Behavioural economists find many instances of people imagining there to be pattern in events that are in fact random. For example, in a flip of four coins, people tend to see more agency or constructed pattern in a HHHH outcome than they do in a HTHH or HTTT outcome, even

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22.   Hogarth and Kunreuther 1991.

23.   Productivity Commission 2010.

24.   Kahneman and Tversky 1979, p. 263.

25.   Camerer and Ho 1994.

though statistically they all have the same 1/16 probability. Many poker machine players believe in "lucky streaks", or that if a machine hasn't paid out for some time it's "due" for a payout. In general terms people tend to interpret certain outcomes of disjunctive events as if they are conjunctive. That is, people may assume a certain connection between successive events even if there is no such connection.

Kunreuther finds that even when people buying insurance do consider probability (they generally don't), personal experience and anecdote carry high weights in people's judgement.

Events that are easy to recall carry a higher subjective probability than events of similar probability but that are less easily known: this is known as the *availability* bias. It's the bias that leads people to over-estimate the probability of aircraft crashes and deaths from shark attacks while underestimating the probability of train crashes and deaths from falls off ladders.

For example, although in Australia most types of crime are on a long-term downward trend, people's perception is that crime rates are rising.[26] So long as there are media stories of crime it is unlikely that such a mis-perception will be corrected.

Ease of recall is boosted by media reports and by the vividness of events. It is easy to overlook the fact that it is often the rarity or the unusual nature of an event that makes it worthy of a media story; routine background happenings go unnoticed. And the more vivid a story the easier it is to recall. A death in a house fire conjures up gruesome images, while a death from carbon monoxide poisoning caused by a vented space heater invokes the same imagery as someone quietly dying in bed.

Also we can be led to beliefs by elaborate stories. One common experiment is to ask randomly-selected groups of people to rate the probabilities of one of three scenarios, each with added specificity. For example:

1. The probability of a plane leaving Tullamarine today crashing.

2. The probability of a plane leaving Tullamarine today crashing as the result of a hijack.

3. The probability of a plane leaving Tullamarine today crashing as the result of a hijack by a mentally deranged person.

Even if one knows nothing about the probability of aircraft crashes, application of basic logic determines that the probabilities have to be in the order 1, 2, 3. The general (an aircraft crashing) has to be more probable than the specific (crashing after hijacking by a deranged person). But people who are presented the most elaborate story (3) rate it as more probable than those who are presented with (2). Similarly respondents who are presented with story (2) rate it as more probable than those who are presented with (1). The richness of a story gives it plausibility: I know that aircraft accidents are infrequent, but the story allows me to see how it could happen.[27]

Many studies in behavioural economics find that people pay little attention to probability: rather they focus on events. Kahneman points out that even if such events are rare they may

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26.   Davis and Dossetor 2000.

27.   This is one of many possible variants of the "Linda" fallacy described in Kahneman 2011 and in many other works on behavioural economics.

be easily recalled to mind because of "vivid images", "concrete representations" and "explicit reminders".[28] Insurers promoting contents insurance don't use drab terms such as "losses" or "adverse events". It's far more effective to use graphic imagery of fires and burglaries.

Howard Kunreuther and Mark Pauly cite evidence that "for low-probability, high-consequence events, those at risk may buy coverage to reduce their anxiety about experiencing a large financial loss, giving them peace of mind."[29]

Kunreuther suggests that in some cases our poor handling of probability can lead us to under-insure for events that are extremely rare or which have not happened for a long time. But the overall impact of these biases is to heighten our awareness and to over-estimate risk, leading to the probability of over-insurance.

Calculation difficulties and framing

Warning to the reader: this and the following two sections are probably best read with the help of a pen and paper to jot down a few calculations. The arithmetic is simple but the points are more easily understood if one does the actual calculations

As suggested in Part 1, a "rational" way of considering the value of insurance is to compare the expected cost of a claim (probability of an adverse event X the cost imposed by that event) with cost of the premium.

Another way leading to a different decision, is to pose the question to oneself "what would I save if I stopped paying premiums and how does that compare with what I would have to outlay if the adverse event happened today?"

Those familiar with financial mathematics will recognize this as a problem in comparing the *net present value* of future premiums to the *net present value* of a possible claim.

If (allowing for inflation adjustment) I were paying $100 a year for a policy, the cost of going on paying for insurance may appear to be:

$100 X my remaining expected years of life

But that yields absurd results, and unless I am nearing death, would vastly over-estimate the cost of premiums, because it doesn't take into account the time value of money. The $100 I outlay next year doesn't cost me $100 now: it costs less because I could invest a lesser amount – say $95 – which would pay my $100 premium in a year's time. And so on for future years.

What financiers call the *present value* (really the present cost) of a stream of outlays into the indefinite future is given by the simple formula:

Value of outlay ÷ interest rate

where the interest rate is what I may earn on an investment.

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28.   Kahneman 2011, p. 333.

29.   Kunreuther and Pauly 2015, p. 3.

Thus if my interest rate is 4.0 per cent (a real rate used by conservative financial planners), the present value of paying $100 into perpetuity is $2 500. (An easier way of looking at this is to consider that if I invest $2 500 at 4.0 per cent return, it would finance my annual $100 premiums into eternity.)

The scenario presented in Part 1, using a typical loss ratio of 58 per cent, showed that a premium to cover a risk of $100 000 with a two per cent probability would be around $3 500 a year.

That would mean the present value of my premiums – what I would save by not insuring – would be around $87 500 ($3 500 ÷ .04). That is less than the $100 000 I would have to pay if the robbery or fire were to happen today, so I may come to the conclusion that I should insure.

The trouble with such a calculation is that the probability of the adverse event happening *today* is only two percent. The actuarial cost of that claim, with a two percent probability of happening in every year, is $50 000. That's significantly less than the $87 500 I would have to outlay to fund my future premiums.[30] If I cancel my policy today and the adverse event occurs tomorrow, I'm out of luck. But if it doesn't happen for many years, I'm in luck. (At a four percent interest rate I would be ahead after 20 years without a claim.[31])

The question "what would I save if I stopped paying premiums and how does that compare with what I would have to outlay if the adverse event happened today?" can appear to "rationally" consider the time value of money, but the "today" frame biases the decision towards keeping or taking up insurance.

Anchoring and confusion

Behavioural economists refer to the way our decision-making starts not with a clean slate, but from a particular position or *anchor* from which we assess alternatives, and our behaviour will differ according to how we have set an anchor. For example, when we receive a bill from a tradesperson offering an incentive for prompt payment, he or she may have presented it in one of two ways:

- $1200, with a $30 discount for payment within seven days;

    or

- $1170, with a $30 surcharge if not paid within seven days.

Objectively the two situations are identical, but as anchors they evoke different behaviours. One presents a reward, the other a penalty. Psychologists suggest people are more motivated by rewards than by penalties,[32] but evidence in support of that proposition is mainly in the field of motivation. Behavioural economists looking at one-off financial transactions, by

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30.   The $50 000 is obtained by discounting, at 4.0 per cent, an outlay of $2000 a year into perpetuity ($2000 ÷ .04). Unsurprisingly, whatever discount rate (interest rate) is used, the ratio of the present value of the premiums to the present value of the risk is determined by the loss ratio.

31.   By year 21 the present value of a $100 000 outlay, at 4.0 percent, is less than $45 000.

32.   See, for example, Kohn 1999.

contrast, find that in situations similar to the tradesman's bill people are more concerned by the prospect of a $30 loss than the prospect of a $30 gain.

The explanation lies in people's asymmetrical assessment of gains and losses. People tend to experience the pain of a loss much more strongly than they experience the pleasure of a gain of the same amount. Kunreuther, citing the work of Tversky and Kahneman, suggests that the ratio of pain to gain for an equivalent monetary amount is about two to one,[33] but whatever the ratio (and it is unlikely to be fixed across the scale), it is a long way from equality.

The other point, stressed by behavioural economists, is that in both the domains of gain and pain the function relating monetary outcomes to our "utility" – a term covering both gain and pain – is convex. That is, the function is subject to diminishing returns. In terms of gain it is reasonably well understood that as our financial income or wealth increases, each increment brings less benefit. The same applies in the domain of pain: once we are in a loss situation each increment of loss is less subjectively significant. For example, if I find that a stone has broken my windshield, and I believe it will cost $100 to replace, I may be annoyed, but I will not be twice as annoyed when I learn that it will actually cost $200 to replace.

The standard presentation of the utility curve, modelling the $30 outlined above, is shown below. The main point is that there are disproportionate gains and losses for the same amount, even though the situations are the same. (Note that the concave curve for losses applies only for losses that are bearable. Severe losses, that can cause a change of state, can have a very strong gradient.)

Figure 3. Losses and gains
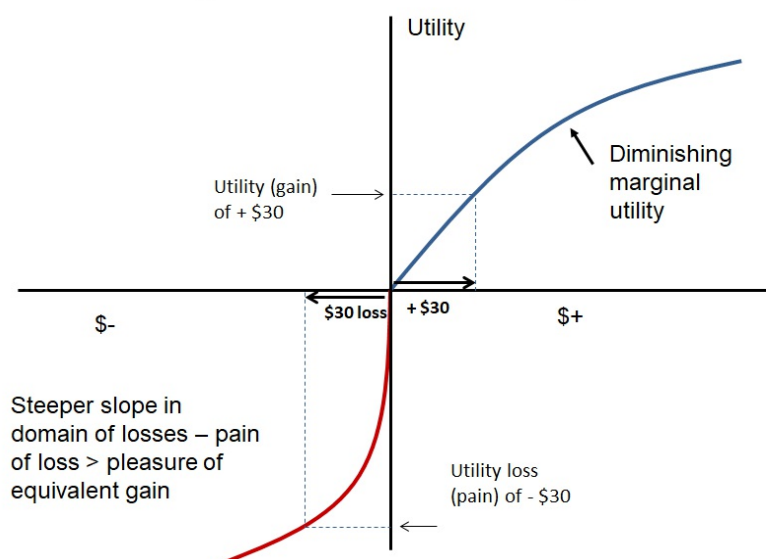
There are three ways particular anchors around pain and gain can lead us to over-insurance.

First is the anchor of the *status quo* bias. That is, my anchor is likely to be what I have always been doing. Even if I am a young person just entering the market it is possible that I see insurance as something a responsible member of society "must have", not only because of the personal "prudence" of holding insurance, but also because risk-sharing involves a form of mutual obligation. I may be influenced by the warnings from governments and consumer organisations about under-insurance – I don't hear many warnings about over-insurance. Kunreuther refers to the possibility that people's decisions on buying insurance are strongly influenced by what they believe other people are doing.[34]

Even if I carefully review my options, wondering whether to buy or not buy, to renew or to drop insurance, the nature of the utility function predisposes me to buy insurance or to keep it. The choice is most easily described in the case of renewal, but the argument also holds for the situation where there is a strong expectation that one will insure.

To return once again to the hypothetical situation in Part 1, I have a choice between paying $3500 for a policy to give me cover for a $100 000 loss with a two per cent probability – an expected cost of $2000. The "rational" response, assuming I can cover a $100 000 loss, is to drop the policy, saving myself $1500 a year. But my attitude to gains and losses may conspire against me, as shown in Figure 4 below,

Figure 4. Losses and gains - $3500 policy
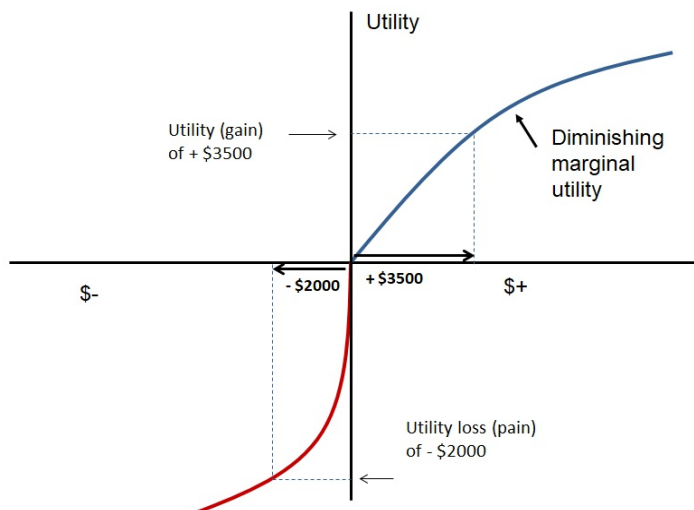
Even though along the monetary (X) axis a gain of $3500 is clearly greater than a loss of $2000, along the utility axis the loss dominates.

The simple "rational" equation is:

Benefit of dropping = $3500 – $2000 = $1500

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34.   Kunreuther 2013.

If Kunreuther's two to one ratio is a guide, then assuming I have a linear utility equation where Utility (U) = u X $ gain or loss, then I am guided to:

Benefit of dropping = u X 3500 - 2u X 2000 = – u X 500

That is a loss of utility.

The same construction explains why I may not take advantage of a discount for accepting an excess (or an excess that's higher than the one I already have). I may calculate the expected cost of the excess correctly (= value of excess X probability of making a claim). But I may over-rate its burden because I see that expected cost as a loss and the discount as a gain. Such asymmetric weighting may lead me to keep the policy.

Sydnor finds strong evidence of inertia in people's insurance decisions, even if they make a considered decision whether to renew rather than using auto-renew. He writes:

One might conjecture that those insured longer would be more sophisticated insureds, and might forgo the expensive lower deductibles [excesses]".[35]

He finds the opposite – the longer people hold insurance the more likely they choose a *low* excess: presumably that's because people's wealth increases over time, and they can "afford" higher-priced insurance with lower excesses – the diametric opposite to the "rational" model.

That leads to the second anchor-related bias to over-insurance. Zur Shapira of New York University and Itzhak Venezia of the Hebrew University of Jerusalem found in experimental conditions that people tended to under-estimate the net value of enjoying a discount for an excess (or a higher excess) because they over-estimated the expected cost of the excess. They explain the likely reason:

We hypothesize that this tendency is caused by the anchoring heuristic. In particular, in pricing a policy with a deductible [excess] subjects first consider the price of a full coverage policy. Then they anchor on the size of the deductible and subtract it from the price of the full coverage policy. However, they do not adjust the price enough upward to take into account the fact that there is only a small chance that the deductible will be applied toward their payments. … This implies that a policy with a deductible priced according to the true expected payments may seem "overpriced" to the insured and therefore may not be purchased.[36]

The European Commission research described in Part 2 came to the same conclusion, that people "did not understand the relationship between premiums and excess".[37]

To continue with the hypothetical policy covering a risk with a two per cent probability, it's as if, when I am offered a $100 discount to accept a $1000 excess, instead of rating my expected cost of the excess at $20 (2.0 per cent of $1000), I subjectively apply a higher probability to claiming on the policy – or even consider it as "$100 discount for a $1000 liability."

The third anchoring error occurs when people consider their losses from a zero base, rather than from the perspective of their wealth, or at least their liquid wealth.

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35.   Sydnor 2010, p.183.

36.   Shapira and Venezia 2007, p. 2.

37.   European Commission 2017, p. 176.

The two preceding explanations of over-insurance are about anchoring on a zero base. Any loss occurs in that zone where it really hurts. There is no reason, however, why the anchor should be at a zero base.

To illustrate, below is a simulation that illustrates the effect of re-framing. Participants in a behavioural economics experiment (or an economics class in a university) are asked to respond to the following question:

> Would you enter a gamble in which, on the toss of a coin, you had the chance to win $2000 or lose $1800?

Most participants decline the bet, even though it has an expected gain of $100:

> Expected gain = 0.5 X 2000 – 0.5 X 1800

They are then asked to respond to the following question:

> Make a rough calculation of your realisable wealth, W. Include bank accounts, shares and other investments. Would you enter a gamble in which, on the toss of a coin, the payoffs are $W + $2000 and $W – $1800?

Many respondents shift their decision and go for the gamble.

Objectively the situation hasn't changed, but while the default in the first question is a zero anchor, the default in the second question is a positive anchor. In the first frame loss aversion amplifies the pain of losing $1800 – if the two to one ratio holds the arithmetic will look like:

> Cost of gamble = u X 0.5 X 2000 – 2u X 0.5 X 1800 = – u X 800

But in the second case re-framing puts the decision in the context of wealth. If one's liquid wealth is $50 000 (close to the figure revealed in Table 1 for average household liquid wealth), the gamble becomes one between a 50 per cent chance of $52 000 and a 50 per cent chance of $48 200 in wealth.

This example illustrates the bias of *myopic loss-aversion*. It's myopic because it focuses too closely on a zero frame point. A wider perspective is to ask "considering all I have, how will my life really change if I take this modest gamble?"

While those who sell insurance will probably use a zero frame to promote their products, if consumers consider their assets, particularly their liquid assets, they will probably be more inclined to self-insure for manageable losses, such as everyday contents and modestly-priced cars (while covering their vehicles for third party property to cover the risk of smashing into a Lamborghini), and to taking advantage of excesses in return for lower-priced cover.

Extreme loss aversion – peace of mind and pseudocertainty

Howard Kunreuther and Mark Pauly cite evidence that "for low-probability, high-consequence events, those at risk may buy coverage to reduce their anxiety about experiencing a large financial loss, giving them peace of mind."[38]

Similarly the European study referred to before refers to the desire for "peace of mind":

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38.   Kunreuther and Pauly 2015.

Consumers may purchase products without giving their decision too much thought for motivations relating to 'peace of mind'. This is the main driver in decisions leading to over-insurance and to payment of premiums which are too expensive for the cover they offer. This motivation is linked to loss and regret aversion. Consumers may fear a potential loss to an extent that makes them willing to pay a high premium to insure against it.[39]

In Australia a 1998 Bureau of Statistics survey of reasons people hold private health insurance found that 72 per cent of respondents gave "security, protection, peace of mind" as a reason for holding private health insurance, far outranking other reasons to do with choice of doctor and taking advantage of the financial incentives on offer from the government.[40]

Regardless of considerations of net expected costs and utility functions, a desire for "peace of mind" seems to motivate people to hold first-dollar cover – that is insurance without any excess. It may be a premium people pay for not having to think about a class of risk. Of course, if the adverse event eventuates, they will still have to go through the administrative and other non-financial costs of a loss, but at least they won't have to concern themselves with the financial cost of replacing the asset.

Max Bazerman describes an experiment where two different groups are asked different questions. The first group is asked to respond to the following scenario:

There are two strains of flu coming in the next few months. Each can strike with equal probability and each is similar in its effects.

A vaccine is available for $40, with a side effect of possible slight nausea. It gives 100 per cent protection against one strain but none against the other.

Do you get vaccinated?

The other group is given a different scenario:

A strain of flu is coming in the next few months.

A vaccine is available for $40, with a side effect of possible slight nausea. It gives 50 per cent protection against the flu.

Do you get vaccinated?[41]

In terms of any consequences participants may be able to envisage, the scenarios are identical. But when these and similar pairs of questions are put to people, there is far more uptake of cover in the first situation.

Bazerman coined the term *pseudocertainty* to describe the thinking underlying such outcomes. Rather than taking a portfolio approach to risk and uncertainty, people tend to compartmentalise their management of contingencies and seek to achieve "peace of mind" in certain areas while leaving themselves uncovered in other areas.

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39.   European Commission 2017, p. 81.

40.   ABS Health Insurance Survey, June 1998, Cat 4335.0.

41.   The flu scenario is one used by Bazerman in a seminar, but is conceptually similar to his explanation of pseudocertainty in his 1998 work.

Kahneman found similar results in studying parents' choices in protecting children against two specific hazards, and found that parents were willing to pay a high premium for eliminating one risk only. He wrote:

> When you pay attention to a threat, you worry – and the decision weights reflect how much you worry. Because of the possibility [pseudocertainty] effect, the worry is not proportional to the probability of the threat. Reducing or mitigating is not adequate; to eliminate the worry the probability must be brought down to zero.[42]

In other words, there is no simple "worry" function that allows me to reduce my worrying as my perceived risk decreases: either I worry or I don't. Perhaps readers can recall instances when they were cutting it fine to catch a plane: as they came closer to the airport their worry didn't necessarily subside. Only when they checked in were they relieved of worry.

Kunreuther also refers to people's practice of taking insurance against specific risks at very high expected cost, such as insurance against aircraft accidents and insurance to waive the excess charge when renting cars. In the USA many people who may otherwise not have very good health insurance take out cancer insurance.[43] He suggests that those who buy insurance against aircraft accidents may be influenced by the apparently large sums involved.

Richard Thaler refers to the phenomenon of people holding *mental accounts.*

> [Mental accounting] involves the assignment of activities to specific accounts. Both the sources and uses of funds are labeled in real as well as in mental accounting. Expenditures are grouped into categories (housing, food etc.) and spending is sometimes constrained by implicit or explicit budgets.[44]

If people compartmentalise their risks and uncertainties, it is possible that they will misallocate their resources and leave themselves over-exposed to certain risks. If people have a limited "insurance budget", and take out full cover for certain contingencies, they may exhaust their "insurance budget" without covering for some of the worst contingencies. This is a situation where over-insurance in certain areas can lead to under-insurance in others.

Sentimental insurance – the affection effect

Many people have items endowed with "sentiment value". These are items that they wouldn't buy if they had the option at the present time, such as inherited pieces of furniture or jewellery, works of art bought on some special occasion, wedding gifts and so on.

Christopher Hsee of Chicago University and Howard Kunreuther found, unsurprisingly, that people were more inclined to insure such items if they had some personal meaning than if they were simply viewed in terms of their utility.[45]

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42.   Kahneman 2011, p. 315.

43.   Kunreuther 2013.

44.   Thaler 2008, reproduced in Kahneman and Tversky 2000, p. 241.

45.   Hsee and Kunreuther 2000.

Such behaviour is consistent with what behavioural economists call the *endowment effect*. We place more value on those things we already have than we place on the option of buying them if we do not already have them.

Their findings on insurance went further than a confirmation of the endowment effect, however. When listing such items for insurance valuation, or when making claims, consumers and insurers can become embroiled in disputes about "fair market valuation" and the value placed on such items by their owners. Hsee and Kunreuther found that "people are more willing to purchase insurance for an object at stake, the more affection they have for the object, *holding the amount of compensation constant*." (Their emphasis.) At the margin at least, there seems to be a form of voluntary and knowing over-insurance for such items.

They suggested that this bias, which they called the "affection effect", was about seeing a possible insurance payout not as a means towards restoration of the enjoyment the goods once provided, such restoration being impossible, but as a compensation for the pain of their loss.

Junk policies and mental overload

A discussion of over-insurance is incomplete without mention of policies at the extreme end of the consumer value spectrum. These include insurance with vanishingly small probability of a payout, such as add-on death insurance sold by car dealers (to cover the event that there will be a loan liability not covered by the buyer's estate in the event of his or her death.) They also include insurance for adverse events for which the consumer is already covered, such as extended warranty insurance, when there are already provisions of trade practices legislation providing cover against faulty or defective products.

Such practices are already subject to attention by consumer organisations and by governments,[46] though some would say not enough.

Behavioural economics gives some insight into their persistence, because such policies are generally sold as "add-ons" when consumers are making other purchases. Kahneman points out that even if I am thinking rationally about my main purchase – the car, the new cellphone – my mind may be fully occupied with that main task, and I fall back on to quick judgment to make the supplementary decisions. What he calls "system 2" or "slow" thinking – deliberate, careful, analytical thinking – can guide me through the main purchase. But such deliberate thinking takes effort, and can fully occupy my capacity for such thinking. When it comes to ancillary decisions, particularly if the amounts at stake are small in relation to the main purchase, I fall back on "system 1" or fast thinking – impulsive and subject to all the behavioural biases that characterise such thinking.[47]

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46.   See, for example, Australian Securities & Investments Commission 2016 on add-on insurance sold through car dealers.

47.   Kahneman 2011.

4. Public policy on over-insurance

In sum, many people over-insure. They pay for cover they could afford to provide from their own resources, or they fail to take advantage of the benefit of sharing risk with the insurer through buying policies with an excess, or a higher excess than they already have.

In general, over-insurance occurs because of difficulties people have in assessing risk, and because of certain biases in the way people make decisions – biases well-researched in behavioural economics.

The fact that over-insurance is occurring, in itself, is not a reason for policy intervention. There are already policies to deal with extreme cases of over-insurance: these are clearly well in the zone of "rip-offs" where there is a clear justification for intervention.

The over-insurance covered in this paper could be considered as a specific case of everyday consumer behaviour. An equilibrium competitive price paid by all consumers exists only as a textbook model. The whole dynamic of competitive markets involves price dispersion and adjustments by consumers and suppliers in the elusive hunt for equilibrium. Paying too much for something available elsewhere at a lower price is an everyday consumer experience.

If there existed clear evidence that the insurance industry is making excess profits, that would support the proposition that the industry is taking advantage of consumer biases towards over-insurance to enjoy monopoly profits.

But no such evidence exists. This means that over-insurance is either acting as a cross-subsidy from those who over-insure to those who under-insure, or that it is supporting inefficiencies so entrenched in the industry that they are not being eradicated by competition. Possibly both.

Even in the absence of evidence of excess profits, however, there may be grounds for intervention because of the particular nature of the insurance industry. As illustrated in the analysis of computational problems and biases, insurance is a particularly difficult market for consumers.

How Insurance departs from the market model

In many markets consumers can be divided into two categories – those who have the resources to act in their own best interest, and those who do not. As can be ascertained from this paper, the resources a consumer needs to make a "rational" decision on insurance are:

- knowledge of risk factors – both the incidence and cost of adverse incidents;
- knowledge of the basic mathematics in making "rational" decisions;
- objectivity, discipline and self-awareness to overcome behavioural biases;
- time to gather information and to make the necessary calculations.

These are on the demand side. Another condition is on the supply side: to allow "rational" choice, insurers must have on offer a range of products with differing levels of well-priced excesses and possibly other options for risk-sharing.

There is an argument that because all these resources are costly, consumers in the insurance market act with what the economist Herbert Simon called "bounded rationality".[48] According to this model consumers devote resources to shopping up to the point where the marginal cost of spending extra effort equates to the marginal benefit obtained from that extra effort. In everyday language, such behaviour is captured in statements such as "I know I could probably have had a better deal, but I had better things to do than to go on searching and calculating".

"Bounded rationality" is a reasonable description of how people behave in many markets – it often fits with people's behaviour when searching through a wide field of offerings – an apartment to rent, a staff member to hire. But it can become too much of a rationalisation to explain away many forms of market failure.

Applied as a normative standard, accepting "bounded rationality" as a normal market mechanism can be seen in "blame the victim" framework: if only the consumer had done more research, had paid attention in high school mathematics classes, were not so weak in overcoming biases, had spent more time – in other words had been a perfect "rational consumer, he or she would have done better.

There are five reasons why "bounded rationality" as a normative standard is particularly inappropriate for insurance.

First, "bounded rationality" is particularly fitted to markets where the best approach for a shopper may be to follow the herd while spending only limited personal effort in searching for prices and comparing products. Most consumers rely on the assumption that there are enough of what economists call "market perfecting agents" – people who fastidiously shop around. If everyone is shopping at a certain supermarket, it must represent good value. In other words in many markets consumers assume the market is working. It's an efficient assumption in that it saves search costs.

The task of shopping around has become less costly with the proliferation of websites, some with customer reviews. There are comparative websites for insurance, but when consumers don't know which websites to trust the value of such sites is diminished, and insurance is not what marketers call an "experience good" where customer satisfaction can be rapidly gauged. Reviews of Airbnb stays, for example, are useful to consumers, but there can be no reliable equivalent for insurance. Where insurance really counts, in settling big claims, there are few customers, satisfied or dissatisfied.

In insurance, as figures show, the herd behaviour is to buy insurance and to buy "first-dollar" cover or cover with only a small excess. Following the herd is not necessarily a wise choice.

Second, in insurance much of the knowledge required to make a wise choice is not in plain sight to the consumer. There is a large knowledge asymmetry between consumers and insurers, and apart from some specialised data such as crime statistics, data is tightly held by insurers.

Third, as is clear from Part 3, a moderate knowledge of the mathematics of probability is required. It's not a very advanced level, but it is more complex than the arithmetic required

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48. For a short description of "bounded rationality" in the consumer context see OECD 2008; for a more general description see Simon 1957.

for people to calculate unit pricing in supermarkets, for which there has been regulation in acknowledgement of people's computational difficulties.

Fourth, the biases identified by behavioural economists are not just the occasional foible. They're hard-wired into the way people live. As Kahneman and others point out, quick impulsive thinking has enabled humanity to survive in a world of hostile predators. It is still an asset in almost all day-to-day activities. Furthermore, even though behavioural economics as a university discipline is comparatively new, psychologists employed in marketing know these biases, and merchants with good gut feelings have been exploiting these biases as long as markets have existed.

And fifth, while all shopping takes time, some shopping is more enjoyable (or less unenjoyable) than other shopping. People may enjoy browsing in bookshops, or searching websites for camera lenses (the 21st century equivalent of "window shopping"). But for certain products with intangible characteristics, there is no enjoyment to offset the cost of searching.

These are all reasons why the insurance market is a long way from the frictionless models that underpin competitive theory.

It is possible that some of these impediments can be removed at low cost. For example, data on risk factors has many public-good characteristics: insurers have already done the research, and the cost of making it available on websites would be trivial.

Apart from these demand-side impediments there are also supply-side issues that create market distortions.

One is the moral hazard of over-insurance. To the extent that those who over-insure may not take adequate personal responsibility to reduce their own risky behaviour, costs are imposed on all consumers who hold similar policies. (Insurance fraud, when undetected, imposes even greater costs.)

Moral hazard may be seen as an unavoidable collateral cost for those who must have insurance for minor risks, or who insist on first-dollar cover, but it could be reduced if those who could self-insure or buy cover with high excesses did so. In economic terms over-insurance can be seen as behaviour that imposes "negative externalities" (costs on others).[49] For some behaviours, moral hazard imposes costs not only on those with insurance policies provided by the same company, but also on the wider community. A lack of caution with fire, or with securing cars against theft, are cases in point.

This raises questions about insurers' incentives. Competitive market theory suggests that insurance firms, as businesses with profit-maximising objectives, would see over-insurance as a problem because of its moral hazard. Surely it would be in the interests of profit-maximising firms to offer products with high excesses so that they can attract "good" customers who are willing to share some risk with the insurers. Also consumers with high-excess policies aren't going to bother the companies with small claims – broken windows, fused electric motors, ruined freezer contents. Each claim carries a certain cost, no matter how small.

Yet insurers don't offer policies with high excesses. The highest excesses offered to general consumers are around $1000 for cars and $5000 for houses – trivial amounts in comparison

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49.   For an economic analysis of such externalities in insurance, see Rothschild and Stiglitz 1976

with the wealth figures shown in Table 1. The same insurance firms, however, are generally willing to offer products with high excesses to commercial customers, and for large businesses they may be willing to negotiate specific risk-sharing contracts. This suggests that insurers segment the market between domestic consumers, subject to biases and search costs, and business customers, assumed to be more "rational".

The main explanation of insurers' reluctance to engage in risk-sharing with consumers most probably lies not in the economists' model of firms as profit maximisers, but in the model of firms as having multiple objectives – growth, market share, security and others, as well as profit. As pointed out by scholars of business , corporate behaviour is best described in terms of "managerial capitalism", rather than by the models of competitive economics.[50]

This often means that managers of large businesses tend to pursue objectives of growth, with profit as a secondary objective. The larger a firm becomes, the more rewards are to be enjoyed by managers, both in terms of prestige and remuneration. Market share becomes important because there is prestige in one's corporation being larger than its competitors and market share is an easily-measured performance indicator – it plays the role of a corporate scoreboard.

Such a culture leads to a pursuit of customer numbers and of revenue, even if that involves gaining or holding on to comparatively unprofitable business. Performance management systems focus on sales, particularly on attracting customers from competitors and on not losing customers.

In the finance sector an excessive emphasis on sales can often be met without any damage to short-term costs, because the costs of selling unprofitable products aren't immediately manifest. Banking staff can lend money too easily, confident that it will be some time before the consequences of lax lending show up as bad debts.

Similarly in insurance: insurance policies with first-dollar cover bring in more immediate sales revenue than policies involving risk-sharing, even if first-dollar policies may be less profitable than risk-sharing policies. The moral hazard of selling first-dollar cover is not of concern because those costs, statistically, are in the future.

Another possible explanation lies in the benefit of small claims as a means of maintaining customer relationships – a benefit that may override the administrative and moral hazard costs of allowing small claims. Psychologists refer to the practice of *operant conditioning*, which involves giving occasional small rewards as a means of providing people with the incentive to remain engaged in a relationship. It's why poker machines make occasional small payments. Also, a well-handled small claim can boost customers' confidence and trust in their insurance firm.

Getting customers to think about saving money by taking policies with high excesses does nothing for an insurer's immediate cash flow. It also starts to undermine the whole insurance business model, because once people are in the frame of thinking about a tradeoff between the cost of premiums and excesses they are already breaking free of behavioural biases. If I can be persuaded to consider a $5 000 excess on my car insurance or a $10 000 excess on my contents insurance, then that way of thinking may lead me to decide to self-insure, and the

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50. The term "managerial capitalism" was coined by Alfred Chandler and Richard Tedlow of the Harvard Business School. Chandler and Tedlow 1985.

firm has lost a customer. Insurers don't want customers to move into that way of thinking: it's better to use excesses only as a lure to attract customers who may otherwise not buy insurance rather than as a means to attract profitable customers.

Policy responses

The general policy response to situations where people are paying too much for a product is twofold. One is to encourage consumers to shop around; the other is to make sure the consumer is provided with more information.

As pointed out above, shopping around has different costs and benefits in different markets. Evidence from utility markets, which are similar to insurance markets in many aspects, suggests that those who switch suppliers generally over-estimate the benefit from switching, and that many people who switch often switch to more expensive products, particularly when price comparisons are difficult.[51]

Also advocates of shopping around and switching can easily overlook transaction and search costs. Consumers have an opportunity cost of time: in everyday language they could be doing something more rewarding than shopping for insurance. Firms incur costs when customers switch: they have to set up new accounts and the more customers are likely to switch the more do the firms feel compelled to enter the arms race of advertising. These costs incurred in corporations are passed on to consumers.

Cass Sunstein, one of the pioneers in behavioural economics, points out that in many markets people may not wish to choose: forcing people to choose is a form of paternalism.[52] Competition brings benefits but it also has search and transaction costs, and in markets such as utilities and insurance – markets with mature products and processes – the only attraction for the consumer to consider switching is the possibility of lower prices rather than the added benefit of innovations to be found in more dynamic industries.

Competition is a means to an end, that end being consumer welfare. Although policymakers often pursue competition as a strong policy objective, there is no economic theory suggesting it should be an end in itself. It is possible that consumers are becoming increasingly weary of being forced into shopping around.[53]

By contrast with encouraging people to shop around, providing consumers with more information may yield more benefits.

Consumers inclined to making "rational" choices would be helped by the publication of risk data – the probability of adverse events and the costs of such events – on a trusted website. Such data undoubtedly exists, and it probably exists at a reasonably disaggregated geographic and socioeconomic level. If each insurer has its proprietary database there would be issues of commercial confidentiality, but there are probably also industry-wide databases that could be released without disclosing firm-specific information, and it would be possible to charge a government body with the task of aggregating firm-specific information into a public

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51.   See, for example, Wilson and Waddams 2010.

52.   Sunstein 2014.

53.   See Ben-David 2018.

database. Insurers may object to such a transfer of market power, but it is hard to envisage an objection that could be justified on economic grounds.

The other information that would benefit consumers is to know the loss ratio on the class of insurance they are considering. This could be provided in an easily-understood form: "of every $100 you spend on this policy the insurers' costs will be $25." After all, considering that example, the $75 is simply churning the customers' money through premiums and claims. What the customer is paying for is the service – liquidity and risk absorption – represented by the $25. It's reasonable that people should know the price of the product they are buying.

There are other possible public policies to do with excesses. One is to make a minimum excess compulsory on all or on some classes of insurance, as is done in some European countries.[54] This would be not only in the context of reducing moral hazard, but it would also be a "nudge" towards helping consumers think more carefully about their insurance choices,[55] reducing the risk of being over-insured in some areas and under-insured in others.

At the same time insurers could be directed or nudged towards lifting the small limits they offer on excesses for general consumers. It is hard to see a justifiable case for insurers offering high excesses for commercial customers while denying the same opportunity to general consumers.

Possibly, in line with "nudge" approaches, insurers could be directed to make policies with high excesses their default offerings, with emphasis on how much *more* consumers would pay to reduce or eliminate the excess.

Finally, consumer organisations and government agencies concerned with consumer policy could balance their warnings about under-insurance with some advice on how to take a "rational" approach to insurance – to avoid paying for a service that they could provide themselves, and to allocating their spending on insurance more wisely.

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54. European Commission 2017.

55. For a description of "nudging" in public policy, see Thaler and Sunstein 2008.

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