Solidarity Monitor

The baseline measurement September 2017

Contents

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Summary

Insurers use data to estimate the risks of policyholders. An increasing number of (large) databases is becoming available for insurers and more and more big data analyses are applied, the Dutch central bank, DNB, also notes[1]. In theory, this could lead to premiums increasingly being differentiated, up to a point where certain consumers become uninsurable because they are no longer accepted or because they have to pay too high a premium. It is not sure whether this will happen: data might also lead to more insurability. The Dutch Association (of Insurers) wants to follow the developments with the solidarity monitor. With the aid of representative persons defined by an external party and the premiums they have to pay to various insurers for some types of policies, we analyse how the spread in the premium is developing and to what extent consumers remain insurable.

It is not possible yet in this baseline measurement of the solidarity monitor to compare the outcomes with those of earlier years, so we cannot draw any conclusions yet over the spread and insurability. We can however compare the products mutually and assess the current situation. And there we see that all representative persons are insurable for most non-life insurances. Premium differentiation mainly occurs on the basis of object characteristics rather than personal characteristics. With term life insurances, we see that the older someone is, the higher the premium.

[1] See e.g. page 37 at https://www.dnb.nl/binaries/DNB-rapport%20Visie%20op%20de%20toekomst%20van%20de%20verzekringssector,%2013%20december%202016_tcm46-350191.pdf

The members of the Big Data sounding-board group's opinion of this solidarity monitor:

"Data & analytics make a lot of things possible, certainly also for insurers. But there are threats, too, for example, to privacy or to solidarity. That said, we should not throw out the baby with the bathwater. It is therefore good that the Association keeps a finger on the pulse with the solidarity monitor so as not to get caught unawares by negative side effects."

Edgar Karssing
senior university lecturer in professional ethics and integrity management

"With this monitor, the Association makes the contribution it announced to the debate over the effects of big data on insurability. With the focus on solidarity, the Association is also leading the international debate."

Joris van Hoboken
senior research fellow
Institute for Information law, University of Amsterdam

"The solidarity monitor is a good initiative for monitoring client interest, market development and the use of big data."

Sjoerd Laarberg
CEO Allianz Netherlands

"Solidarity is a major public good, but is under pressure because of the increase in data. It is key that we keep a close eye on where it is going so we can intervene when desirable and/or necessary; that is the purpose of this monitor."

Jeroen Breen
Royal Actuarial Society
& Actuarial Institute

"Insurance is based on solidarity. The degree to which it is based on solidarity varies and develops with new personalisation possibilities. The Association's solidarity monitor has made the degree of solidarity measurable, which provides us with future insight into trends. This is vital to the sector, but also to be able to conduct a proper and factual debate over whether personalisation leads to an erosion of solidarity. An excellent initiative!".

Ivonne van den Heuvel
Commercial director ANWB Verzekeren

"As insurers, we must embrace data-driven technology to continue to respond to the needs of consumers and businesses to insure themselves against financial setbacks. Solidarity will continue in the future to be a key prerequisite for the relevance of our business model. With the solidarity monitor, we can now keep a close eye on the development and discuss how solidarity can remain embedded."

Hylke Niermeijer
Achmea

“Big data in the insurance sector no doubt is a complicated matter, also from a privacy perspective. With this monitor, we are trying at one level to keep the matter simple and prevent technology from playing tricks on us.”

Anita Bleeker
privacy lawyer with a.s.r.

“The essence of solidarity is affiliation with one another. It is the foundation of our developing society and of our insurance sector. The affiliation with one another is something we will always preserve. Only the manner in which it is experienced or given shape changes along with society.”

Jan Orthmann
Manager Pricing & Underwriting
Nationale-Nederlanden

1 Introduction

Since time immemorial, insurers have used data for analysing risks and ensuring that sufficient funds are generated to be able to pay the expected claims. Now, with the increasing availability of data, these analyses can be performed better and with greater accuracy. It is important for an insurer to earn enough income to be able to meet the total costs and claims. Insured parties with fewer claims thus contribute to the claims of policyholders with higher claims, the so-called solidarity principle. Big data makes it increasingly possible to change the spread of risks, with people who have fewer risks also having to pay less. This could ultimately mean people with a high risk having to pay such a high premium that they practically cannot afford to do so. We do not want this to happen and we do not know if it will, but this individual uninsurability is an undesirable situation that the Dutch Association wishes to avoid. The Insurer Code of Conduct, for instance, says: "*we enable as many (potential) clients as possible to cover financial risks and will make every effort to prevent people being uninsured against their will.*"

To monitor whether this goal is being achieved, the Dutch Association of Insurers developed the solidarity monitor. In this monitor, the premiums for a number of insurance policies are calculated for various representative persons at a number of insurers. By comparing annually whether the premiums are converging or actually moving further apart, we can establish how insurability develops. In selecting the representative persons, it was decided to focus on the extremes, because the chances are greatest that premiums will diverge here or that consumers become uninsurable. As a result, the averages in this report are neither representative of the population nor of the average consumer.

In other words, the monitor measures differentiation in the long term. The monitor does not reveal whether this differentiation is caused by 'big data analyses' or by something else. So, this monitor does not measure the extent to which insurers apply big data. The monitor measures something far more important: how insurability develops, irrespective of the causes of possible uninsurability. If insurability appears to be under threat, the causes will have to be investigated separately.

2 The survey

The solidarity monitor has been developed against the background of the debate over the possible undesired effects of the use of big data by insurers. This is especially about whether insurers, by using big-data analyses, will differentiate the premiums such that they become unaffordable to some consumers, and that they are marginalised to such an extent that they are no longer accepted anywhere. If that happens, we will see premiums increasingly diverging and thus show a bigger spread. We narrow this down to two questions for the survey: a main question (question 1) and one derived from that.

1. How does the spread of insurance premiums develop over time?
2. To what extent do consumers remain insurable?

In the field of insurability, we are looking at two aspects: acceptance (can anyone get a certain insurance?) and affordability (how expensive is the policy for a representative person in relation to other representative persons?). To answer these questions, we apply data provided by MoneyView. This data comprises the premiums of different representative persons for five different types of insurance, with the insuring party being able to guarantee that the coverage of these products will remain stable over the years ahead. The types of insurance are:

1. Third-party insurance for motor vehicles
2. Private content insurance
3. Private home insurance
4. Private liability insurance
5. Term life insurance

Based on the representative persons, we look for each type of insurance at the spread of the premiums and the affordability and insurability of the representative persons. Because we want to specifically focus on these elements, there are relatively many ‘extreme’ representative persons in the dataset, i.e., people who, through a combination of properties, are either easier or more difficult to insure than the average consumer. This means that the premium averages are not representative of the average consumer. The representative persons used in the study are explained in detail in the appendices.

3 The method

The data comprises various representative persons. We request the premium for each type of insurance (home, content, third party or liability) from insurers so that we have several premiums per type of insurance for each representative person. For example, if we have requested the premiums for 20 different representative persons from 10 different insurers, we would get a database of 200 premiums, one premium for each unique combination of representative person and insurer. Based on these premiums, we calculate the following three derived variables for this baseline measurement:

- Average premium
- Standard deviation
- Rejection rate

Average premium

As the first derived variable, we calculate per type of insurance the average premium for all representative persons with all the insurers. In the previous example, we would therefore calculate the average premium for all 200 unique representative-person-insurer combinations, by adding up all 200 premiums and dividing the sum by 200.

Standard deviation

The standard deviation is a statistical benchmark for spread. The higher the standard deviation, the greater the difference between premiums. In a normal spread, 95% of the observations differs at most twice the value of the standard deviation from the average. The benchmark itself does not say very much because it depends on the values in which the measurement is made. For instance, if the premiums are not measured in euros but in guilders, not only would the average be a factor of 2.2 higher, but also the standard deviation. A variable with a high average value as a rule then also has a higher expected standard deviation than a variable with a low average value. It therefore makes no sense to compare the standard deviations of the different types of insurances with one another. However, it does make sense to analyse the movement in the standard deviation over time. We therefore want to calculate the standard deviation over several years and, through statistical analyses, keep track of whether it significantly increases, decreases or stays the same statistically over time.

Rejection rate

The rejection rate is the number of combinations of representative persons and insurers not given insurance, divided by the total of representative persons with all the insurers. In the first fictitious example, we have 20 representative persons for whom we request a premium from 10 insurers. This gives 200 premiums for all representative-person-insurer combinations. If 100 representative-person-insurer combinations of this total are rejected, it means that 100 of the 200 possible combinations are rejected, which leaves a rejection rate of 50%. We do not know how this 50% is spread. For instance, it is possible that one half of all representative persons is not accepted by any insurer, whereas the other half of all representative persons is accepted everywhere. Another possible extreme is that every representative person is rejected by half the insurers. Both extreme scenarios produce a rejection rate of 50%, but in the first instance, only half the representative persons can get insurance, while in the second case, every representative person can get insurance. What we do know for a fact is that a rejection rate of 100% means that not a single representative person can get insurance. A rejection rate of 0% means that every representative person is accepted by every insurer.

In summary, we can conclude that the standard deviation and the variation coefficient offer insight into the spread of the premiums. The rejection rates offer insight into the acceptance of the representative persons in insurance policies and thus into insurability.

The databases

Data company MoneyView provided databases for most types of insurance. We are actually interested in the premiums for representative persons with a lot of different personal characteristics who have insured objects with many different object characteristics. If we vary all these characteristics, we end up with a database that becomes unmanageable. We can then opt for including fewer characteristics, but then again, we get too few characteristics in the analysis. The fewer factors we now include in the analysis, the bigger the chance that we discover in time that we have not included a factor, but that it is a differentiating factor. That is why we opted for a database with a large number of personal characteristics and a limited number of object characteristics (the people database), as well as a database with a limited number of personal characteristics and a large number of object characteristics (the objects database). With that, we can measure the influence of all the characteristics and the amount of data remains manageable. Because many of both the personal and object characteristics may have been captured before by some insurers on the basis of the postcode, MoneyView has added a third database for a single representative person and a single object at a large number of different addresses (the addresses database). Everything taken together, we have a database with 93,657 different representative persons and 4,965,010 calculated premiums.

Elaborated representative persons

The outcomes for the different types of insurance are relatively abstract and difficult to comprehend at its total level in this baseline measurement. To understand them better and liven them up, we have elaborated some of the representative persons. This means that we have calculated the benchmarks for these representative persons an extra time, in addition to the overall calculation. This makes clear what the impact of the differentiation is on a number of specific recognisable situations. We calculate these representative persons only for the people database.

Hugo

Hugo has just turned adult[2] and lives on his one in a rented flat. He has only just started his first job, where he earns 1000 euros net. He cannot yet afford a car on that, so for the time being, he goes everywhere by bicycle or train. He does have a driver's licence, but has never owned a car. He would really like to have a car to get to his girlfriend quicker; she lives in another part of the country. Hugo has never smoked.

Stef and Babs

Stef and Babs are both 40 years old. They have two young children and have recently bought their first home. Babs earns more, with 3000 euros net per month. She drives a 10-year-old Opel Corsa, but due to a few nasty little accidents, she has no claim-free years. Stef and Babs have not succeeded in stopping smoking.

Naïma and Morad

Naïma and Morad are both 40 years old. They don't have any children. They have been living in their own house for some time now, where they had a new kitchen fitted. Morad is the main breadwinner and earns 4000 euros net per month. They have a larger car for their kitesurfing hobby: an 11-year-old Opel Astra station wagon. They, too, do not have any claim-free years. Naïma and Morad have never smoked.

Henk

Henk is 70 years old. He lives with his almost adult child in rented accommodation and has a monthly income of 1,000 euros net. He drives a 10-year-old Opel Corsa and has 10 claim-free years. Henk smokes medium-cut tobacco.

Coby

[2]Because not every database contains a single man of 18 years, this age varies in a number of cases, with Hugo being born in 1992, 1997 or 1999.

Coby is 70 years old and has recently retired. She lives in rented accommodation and has a net monthly income of 2000 euros. Unfortunately, she does not have claim-free years. Coby stopped smoking some 30 years ago.

Ali and Meryem

Ali and Meryem are 40 years old and still have two live-in children. They own their home and Ali earns 4000 euros net per month. Ali and Meryem have never smoked and drive an 11-year-old Opel Astra.

Erik and Hans

Erik and Hans are 70 years old and retired some years ago. They own their home and have a net monthly income of 5000 euros. They drive a 10-year-old Opel Corsa and have 10 claim-free years. Erik and Hans smoked their last cigarette more than 30 years ago.

Karel and Ineke

Karel and Ineke are 70 years old. They own their home and have a net monthly income of 3000 euros. They drive a 12-year-old Peugeot 307 and have 10 claim-free years. Karel and Ineke both smoke filter-tip cigarettes.

4 The outcomes

Third-party motor vehicle insurance

	People	Regions	Addresses
Average premium (in round euros)	785	794	259
Standard deviation (in round euros)	626	731	68
Rejection rate (%)	23	17	5

We see little difference between the spread in the different databases with the third-party insurance for motor vehicles. We got a database from MoneyView with representative persons with mainly many different personal characteristics, a database with representative persons with mainly many different region characteristics and a database with one specific representative person for many different addresses in the Netherlands. There is no database with many different object characteristics. Instead, three different cars were used in the calculations in each database.

The addresses database has by far the lowest spread and the lowest average premium. This is because the representative person in this database has 10 claim-free years, while the other databases contain many representative persons with no or two claim-free years. Insurers that reject a representative person do it for a large number of reasons, such as minimum age of the driver, a maximum age of the driver, the combination of the car's output, its weight or the number of claim-free years and the age or an unfamiliar address.

We get the following picture for the specific representative persons. Incidentally, we base it on the people database:

	Average premium	Standard deviation	Rejection rate
Hugo	2444	1102	43
Stef and Babs	811	312	8
Naïma and Morad	740	234	11
Henk	342	131	5
Coby	275	86	5
Ali and Meryem	962	430	19
Erik and Hans	389	160	11
Karel and Ineke	506	182	11

We find that the average premium among them differs considerably, and the highest is for the most inexperienced driver. In other words, the number of claim-free years is a key determining variable. The standard deviation for the inexperienced driver is almost half of the average premium: Hugo should therefore shop around.

Contents insurance

	People	Objects	Addresses
Average premium (in round euros)	121	136	143
Standard deviation (in round euros)	42	64	53
Rejection rate (%)	7	36	1

MoneyView provided three databases for content insurance. The first has especially many different personal characteristics and a few object characteristics; the second has many object characteristics and a few personal characteristics; and the third database contains data for a fixed representative person at a high number of different addresses. A detailed description of these representative persons is contained in the appendices.

The outcome shows that the biggest spread is in the database with many different object characteristics, which means that insurers differentiate the premium for content insurance more on the basis of object criteria rather than of personal characteristics. The rejection rate in the people database is low.
With respect to the personal characteristics, most differences occur because the denominator for determining the value of the content is not suitable for the variables belonging to this representative person. As regards the objects, coverage is often refused if (part of) the house is thatched. Moreover, representative persons in both databases are rejected by insurers that have a more regional focus, because these representative persons do not live in the areas where the insurer operates.

We get the following picture for the specific representative persons. This, by the way, is based on the people database. In this database, all the representative persons are renting.

	Average premium	Standard deviation	Rejection rate
Hugo	93	43	2
Stef and Babs	129	41	2
Naïma and Morad	130	40	2
Henk	110	40	2
Coby	105	33	2
Ali and Meryem	140	44	2
Erik and Hans	123	40	44
Karel and Ineke	126	41	2

Hugo gets away the cheapest in the content insurance. Erik and Hans have a high income and are therefore relatively frequently rejected. In the market for content insurance, many insurers still use the 'content value denominator'[1] to calculate the risk. This denominator, that has not been maintained since 1 January 2016, used as 'highest' income category a net monthly income of up to EUR 4,850. With their EUR 5,000, Erik and Hans are just above it, which means they fall 'outside the denominator' and are no longer automatically accepted by some insurers. They can, however, go to another insurer or take out content insurance differently, such as through an assessor or by personally calculating and reporting the value of their content.

[1] https://www.verzekeraars.nl/verzekeringsbranche/publicaties/Paginas/De-Inboedelwaardemeter.aspx

Buildings

	People	Objects	Addresses
Average premium (in round euros)	179	417	196
Standard deviation (in round euros)	41	436	51
Rejection rate (%)	2	40	1

We also have three databases for building insurance, the first with representative persons who mainly differ on the basis of personal characteristics, the second with representative persons differing mainly based on object characteristics, and the third with a fixed representative person at different addresses in the Netherlands. As with content, we see by far the biggest spread on the basis of object characteristics, which in turn means that insurers differentiate the premium mainly on the basis of the insured objects and less on the basis of the personal characteristics. The rejection rate, too, is much higher for the objects database. Here, rejections are based on the postcode by regional insurers or because the structure is (partly) thatched. We also see rejections because the floor area, content or reconstruction value of the structure exceeds the maximum set by the insurers.

We get the following picture for the specific representative persons. This, by the way, is based on the people database. In this database, all the representative persons own their home.

	Average premium	Standard deviation	Rejection rate
Hugo	184	43	2
Stef and Babs	183	41	2
Naïma and Morad	179	40	2
Henk	176	41	2
Coby	171	41	2
Ali and Meryem	183	41	2
Erik and Hans	173	40	2
Karel and Ineke	172	41	2

The premiums, standard deviation and the rejection rate of the representative persons barely differ from the entire database.

General Liability (family)

	General liability (family)
Average premium (in round euros)	62
Standard deviation (in round euros)	16
Rejection rate (%)	11

MoneyView provided one database with representative persons for private liability insurance.

If we translate this to the representative persons, it sketches the following picture:

	Average premium	Standard deviation	Rejection rate
Hugo	55	17	11
Stef and Babs	71	12	11
Naïma and Morad	65	11	11
Henk	69	13	11
Coby	42	7	11
Ali and Meryem	71	12	11
Erik and Hans	64	12	11
Karel and Ineke	64	12	11

The mutual differences are small and this picture also hardly differs from the entire database. Liability insurance, for private individuals, is not expensive and very easy to come by.

MRI

Term life insurance is more complicated than non-life insurance. The premium also depends on the insured amount that is paid out when the insured person dies and the period for which the insurance is taken out. Also, one or two people may be insured and it is possible that the premium changes in the interim. To make the premium easily comparable, MoneyView has developed the 'comparison premium'. This is the sum of the discounted value of all the premiums, with the discount factor taking into account an interest rate of 2% and the chance of mortality. Because this is the sum of all the premiums paid over the entire period, the comparison premium is very high, as a result of which it is not easily recognised and is not easily comparable with the non-life premiums. We have adjusted this by reducing the comparison premium on an annual basis, by dividing it by the number of years for which the cover is valid. This produces an annual comparison premium that we have used for the analysis.

MoneyView provided data for three different types of term life insurance. The insured amount of the first is subject to an annuity reduction, the second stays the same over the entire period and the third insured amount is subject to linear reduction. For these types of insurance, we received a database with representative persons and one with a fixed representative person and a large number of different addresses. The outcomes are shown below, first for the representative persons and then for the addresses.

Representative persons

	Annuity reduction	Unchanged	Linear reduction
Average premium (in round euros)	943	1404	839
Standard deviation (in round euros)	1721	2357	1568
Rejection rate (%)	43	44	43

As can be expected, the average comparable annual premium is the highest for the insurance with an unchanging amount and the lowest for the MRI with linear reduction. Because the representative persons are again skewered by 'extreme' representative persons, the premiums are again not representative of the population or the average consumer. The spread in the premiums is relatively high. The standard deviation is higher than average.

As the rejection rate is relatively high, we analysed further which representative persons are rejected. This shows that it is impossible for representative persons of 85 years to get term life insurance. Among all the other ages, the rejection rate is less than 100%.

The rejection rate for all the representative-person-insurer combinations is 43%. This means that of the 77,220 records among annuity insurances, 33,218 had been rejected. For insurances staying unchanged, that is 33,684 of the 75,504 records and for linear-reduction insurances, 32,558 of the 77,220. The reasons for the rejection and how frequently they occur are shown in the table below.

Reasons for rejection

	Annuity reduction	Unchanged	Linear reduction
Final age of the first insured party is too high.	10948	10804	10740
Commencement age of first insured is too high.	10032	9960	9564
Insured amount for first insured is too high.	7614	6810	7614
Product can only be taken out by a singled insured.	4290	5148	4290
Invalid payment term 'month' chosen.	0	858	0
Final age for premium payment of first is too high.	208	0	208
Premium is too low.	126	104	142

Because the first three categories are rather large, we break them down in the subreasons:

Final age of the first insured party is too high.

	Annuity reduction	Unchanged	Linear reduction
The maximum final age is 75 years.	5216	5216	5008
The maximum final age is 80 years.	2608	2464	2608
The maximum final age is 84 years.	1872	1872	1872
The maximum final age is 74 years.	576	576	576
The maximum final age is 79 years.	468	468	468
The maximum final age is 85 years.	208	208	208

Commencement age of the first insured party is too high.

	Annuity reduction	Unchanged	Linear reduction
The maximum is 65 years.	5472	5472	5472
The maximum is 74 years.	1092	1092	1092
The maximum is 60 years.	936	936	468
The maximum is 70 years.	924	852	924
The maximum is 64 years.	864	864	864
The maximum is 67 years.	744	744	744

The insured amount for the first insured is too high.

	Annuity reduction	Unchanged	Linear reduction
The maximum is 500,000 euros.	1920	1620	1920
The maximum is 400,000 euros.	1728	1728	1728
The maximum is 75,000 euros.	1728	1728	1728
The maximum is 300,000 euros.	1008	504	1008
The maximum is 250,000 euros.	768	768	768
The maximum is 99,9999 euros.	264	264	264
The maximum is 750,000 euros.	198	198	198

The outcomes based on the addresses database differ strongly from the outcomes based on the representative persons database. The average premium and the spread are lower because fewer extreme representative persons are found in the outcomes. The rejection rates of two of the three types of insurance are zero. The 2% rejection for the unchanged insurance in all the cases is because of an invalid payment term.

Addresses

	Annuity reduction	Unchanged	Linear reduction
Average premium (in round euros)	65	94	57
Standard deviation (in round euros)	18	16	17
Rejection rate (%)	0	2	0

If we translate this overall picture to our representative persons, it produces the following picture:

Annuity	Average premium	Standard deviation	Rejection rate
Hugo	112	65	11
Stef and Babs	796	609	19
Naïma and Morad	412	297	19
Henk	6501	4949	93
Coby	3444	2728	93
Ali and Meryem	412	297	19
Erik and Hans	5209	4128	93
Karel and Ineke	9956	7556	93
Equal			
Hugo	138	84	12
Stef and Babs	1266	1003	20
Naïma and Morad	630	489	20
Henk	8472	5938	93
Coby	4433	3028	93
Ali and Meryem	630	489	20
Erik and Hans	6488	4450	93
Karel and Ineke	12412	8678	93
Linear			
Hugo	102	59	12
Stef and Babs	673	502	19
Naïma and Morad	353	248	19
Henk	5968	4544	92
Coby	3143	2479	92
Ali and Meryem	353	248	19
Erik and Hans	4756	3754	92
Karel and Ineke	9142	6932	92

We see representative persons of 70 years paying a much higher premium if they still wish to take out term life insurance. The premiums for the other representative persons are much lower. Stef and Babs pay relatively a lot because they both smoke.

Appendix 1 The MoneyView data

MoneyView provided data for five different types of insurance, which are the following:

- Content insurance
- Building insurance
- Third-party insurance for motor vehicles
- Private liability insurance
- Term life insurance

We worked with several datasets per type of insurance. As a rule, there are three datasets:

- A dataset with a large number of different representative persons and a few objects to be insured. This is the people database.
- A dataset with a large number of objects and a few representative persons – the objects database.
- A dataset with one object and one representative person, calculated for very large number of real addresses.

Below, you can find a description per insurance product of the data supplied by MoneyView.

Car – Third Party

For the database with personal characteristics, MoneyView compiled 252 different profiles and calculated the premium for each profile at 50 different insurers. This produces a database with 12,600 different third-party premiums. The profiles are all the possible combinations of the following characteristics:

Car / production date / listed price / current value / weight

- Peugeot 307 SW Turbo Diesel / 01JUL2005 / 28300 / 4531 / 1377
- Opel Astra Station Wagon Petrol / 01JUL2006 / 21970 / 5537 / 1215
- Opel Corsa 1.2 Business Petrol / 01JUL2007 / 14795 / 4329 / 1000

Date of birth / age:

- 01JAN1932 / 85
- 01JAN1937 / 80
- 01JAN1942 / 75
- 01JAN1947 / 70
- 01JAN1957 / 60
- 01JAN1967 / 50
- 01JAN1977 / 40
- 01JAN1987 / 30
- 01JAN1989 / 28
- 01JAN1991 / 26
- 01JAN1993 / 24
- 01JAN1995 / 22
- 01JAN1997 / 20
- 01JAN1999 / 18

Claim-free years

- 0
- 10

Postcode / House number

- 1102 LA / 1
- 4817 KZ / 9
- 8431 MB / 401

For the database with object characteristics, MoneyView compiled 18 different profiles at 210 different addresses and for each combination of these, calculated the premiums of 61 different insurers. This produces a database with 189000 different third-party premiums. The profiles are all the possible combinations of the following characteristics:

Car / production date / listed price / current value / weight

- Peugeot 307 SW Turbo Diesel / 01JUL2005 / 28300 / 4531 / 1377
- Opel Astra Station Wagon Petrol / 01JUL2006 / 21970 / 5537 / 1215
- Opel Corsa 1.2 Business Petrol / 01JUL2007 / 14795 / 4329 / 1000

Date of birth / Age / Claim-free years

- 01JAN1999 / 18 / 0
- 01JAN1991 / 26 / 2
- 01JAN1977 / 40 / 0
- 01JAN1977 / 40 / 10
- 01JAN1947 / 70 / 0
- 01JAN1947 / 70 / 10

For the analysis at real addresses, MoneyView calculated the third-party premium of 50 insurers for 20,000 addresses. This produces a database with 1,000,000 premiums. The following choice was made for the personal and object characteristics:

Age:	40 years
Claim free:	10 years
Car:	Opel Corsa 1.2 Business Petrol
Production date:	01JUL2007
Listed price:	14,795
Current value:	4,329
Weight:	1,000

Contents

For the database with personal characteristics, MoneyView compiled 2,464 different profiles and calculated the content premium of 63 different insurers for each profile. This produces a database with 155,232 different content premiums. The profiles are all the possible combinations of the following characteristics:

Family situation:

- Single without children
- Single with children
- Family without children
- Family with children

Date of birth / age:

- 04APR1947 / 70
- 04APR1952 / 65
- 04APR1957 / 60
- 04APR1962 / 55
- 04APR1967 / 50
- 04APR1972 / 45
- 04APR1977 / 40
- 04APR1982 / 35
- 04APR1987 / 30
- 04APR1992 / 25
- 04APR1997 / 20

Net monthly income of the main breadwinner

- 1,000
- 2,000
- 2,500
- 3,000
- 3,500
- 4,000
- 4,500
- 5,000

Postcode / House number / Construction date / Home content / Floor area of home

- 2061 TS 71 / 01JAN1927 / 383 / 118
- 2623 HM 7 / 01JAN1980 / 325 / 105
- 2719 TN 50 / 01JAN1994 / 375 / 135
- 2805 GW 68 / 01JAN1986 / 325 / 100
- 7813 CP 4 / 01JAN2012 / 435 / 112
- 8606 BD 5 / 01JAN1931 / 315 / 110
- 9663 EJ 32 / 01JAN1970 / 350 / 110

Owner

- No

Type of home

- Terraced house

Building nature

- Bricks/hard

Number of rooms
- 5

Reconstruction value
- 210,000

Property tax value
- 210,000

Glass cover
- No

Standard furniture
- 65,000

Standard furniture info folio
- 65,000

Security
- None

Own risk
- 0

For the database with object characteristics, MoneyView compiled 720 different profiles and calculated the content premium of 61 different insurers for each profile. This produces a database with 43,920 different content premiums. The profiles are all the possible combinations of the following characteristics:

Family situation:
- Single without children

Date of birth / age:
- 04APR1984 / 33

Net monthly income of the main breadwinner
- 2,400

Postcode / House number
- 1015 BR / 78
- 1261 HL / 16
- 1325 LB / 11
- 1551 SC / 1
- 3059 XT / 536
- 3404 GC / 38
- 4524 MB / 6
- 5133 AK / 6
- 6041 LX / 97A
- 6971 EG / 41
- 7415 BV / 11

- 8051 SZ /7
- 8441 PH /81
- 9335 TB /113
- 9714 CP / 12A

Owner
- No

Construction date / Home content / Floor space / Number of rooms
- 01JAN1614 / 713 / 212 / 7
- 01JAN1825 / 1908 / 425 / 9
- 01JAN1883 / 1532 / 329 / 9
- 01JAN1928 / 400 / 110 / 6
- 01JAN1935 / 2200 / 210 / 4
- 01JAN1954 / 350 / 136 / 4
- 01JAN1978 / 325 / 105 / 4
- 01JAN2002 / 400 / 135 / 5
- 01JAN2005 / 713 / 225 / 5
- 01JAN2007 / 450 / 120 / 4
- 01JAN2008 / 608 / 156 / 4
- 01JAN2009 / 250 / 83 / 2

Building nature
- WOOD/HARD
- WOODEN FRAME
- BRICK/HARD
- BRICK/THATCH

Type of home
- Terraced house

Building nature
- Bricks/hard

Number of rooms
- 5

Reconstruction value
- 210,000

Property tax value
- 210,000

Glass cover
- No

Standard furniture
- 65,000

Standard furniture info folio
- 65,000

Security
- None

Own risk
- 0

For the analysis of the real addresses, MoneyView calculated the content premium for 20,000 addresses at 63 insurers. This produces a database with 1,260,000 premiums. The following choice was made for the personal and object characteristics:

Date of birth	04APR1980
Family situation	FAMILY WITH CHILDREN
Monthly income	2150
Owner	NO
Type of home	TERRACED HOUSE
Building type	BRICK/HARD
Construction date	01JAN1980
Volume of home m3	375
Floor space m2	110
Number of rooms	4
Reconstruction value	210,000
Property tax value	210,000
Glass cover	NONE
Standard furniture	65000
Standard furniture info folio	65000
Security	NONE
Own risk	0

Buildings

For the database with personal characteristics, MoneyView compiled 2,464 different profiles and calculated the premium for each profile at 61 different insurers. This produces a database with 150,304 different building premiums. The profiles are all the possible combinations of the following characteristics:

Family situation:

- Single without children
- Single with children
- Family without children
- Family with children

Date of birth / age:

- 04APR1947 / 70
- 04APR1952 / 65
- 04APR1957 / 60
- 04APR1962 / 55
- 04APR1967 / 50
- 04APR1972 / 45
- 04APR1977 / 40
- 04APR1982 / 35
- 04APR1987 / 30
- 04APR1992 / 25
- 04APR1997 / 20

Net monthly income of the main breadwinner

- 1,000
- 2,000
- 2,500
- 3,000
- 3,500
- 4,000
- 4,500
- 5,000

Postcode / House number / Construction date / Home content / Floor area of home

- 2061 TS 71 / 01JAN1927 / 383 / 118
- 2623 HM 7 / 01JAN1980 / 325 / 105
- 2719 TN 50 / 01JAN1994 / 375 / 135
- 2805 GW 68 / 01JAN1986 / 325 / 100
- 7813 CP 4 / 01JAN2012 / 435 / 112
- 8606 BD 5 / 01JAN1931 / 315 / 110
- 9663 EJ 32 / 01JAN1970 / 350 / 110

Type of home

- Terraced house

Building nature

- Bricks/hard

Number of rooms

- 5

Storey floors
- Concrete

Property tax value
- 210,000

Glass cover
- Double glazing

Reconstruction value
- 210,000

Reconstruction value info folio
- 210,000

Funding
- Piling

Home construction
- Normal

Facade construction
- Normal

Kitchen finish
- 0

Bathroom finish
- 0

Living room finish
- Normal

Own risk
- 0

For the database with object characteristics, MoneyView compiled 720 different profiles and calculated the premium for each profile at 61 different insurers. This produces a database with 43,920 different building premiums. The profiles are all the possible combinations of the following characteristics:

Family situation:
- Single without children

Date of birth / age:
- 04APR1984 / 33

Net monthly income of the main breadwinner
- 2,400

Postcode / House number
- 1015 BR / 78
- 1261 HL / 16
- 1325 LB / 11
- 1551 SC / 1
- 3059 XT / 536
- 3404 GC / 38
- 4524 MB / 6
- 5133 AK / 6
- 6041 LX / 97A
- 6971 EG / 41
- 7415 BV / 11
- 8051 SZ /7
- 8441 PH /81
- 9335 TB /113
- 9714 CP / 12A

Construction year / Home content / Floorspace / Number of rooms / Home construction
- 1614 / 713 / 212 / 7 / Normal
- 1825 / 1908 / 425 / 9 / Exceptional
- 1883 / 1532 / 329 / 9 / Normal
- 1928 / 400 / 110 / 6 / Flat
- 1935 / 2200 / 210 / 4 / Normal
- 1954 / 350 / 136 / 4 / Normal
- 1978 / 325 / 105 / 4 / Normal
- 2002 / 400 / 135 / 5 / Flat
- 2005 / 713 / 225 / 5 / Normal
- 2007 / 450 / 120 / 4 / Normal
- 2008 / 608 / 156 / 4 / Flat
- 2009 / 250 / 83 / 2 / Flat

Building nature
- WOOD/HARD
- WOODEN FRAME
- BRICK/HARD
- BRICK/THATCH

Type of home
- Terraced house

Storey floors
- Concrete

Property tax value
- 210,000

Glass cover
- Double glazing

Reconstruction value
- 210,000

Reconstruction value info folio
- 210,000

Funding
- Piling

Facade construction
- Normal

Kitchen finish
- 0

Bathroom finish
- 0

Living room finish
- Normal

Own risk
- 0

For the analysis at the real addresses, MoneyView calculated the building premium for 20,000 addresses at 61 insurers. This produces a database with 1,220,000 premiums. The following choice was made for the personal and object characteristics:

Age	37
Date of birth	04APR1980
Family situation	FAMILY WITH CHILDREN
Monthly income	2150
Construction year	1971
Type of home	TERRACED HOUSE
Building type	BRICK/HARD
Number of rooms	4
Storey floors	CONCRETE
Property tax value	210,000
Glass cover	DOUBLE GLAZING
Reconstruction value	210,000
Reconstruction value info folio	210.000
Floor space m2	110
Volume of home m3	375
Foundation	PILING
Home construction	NORMAL
Facade construction	NORMAL
Kitchen finish	0
Bathroom finish	0
Living room finish	NORMAL
Own risk	0

GENERAL LIABILITY (FAMILY)

For private liability insurance, MoneyView compiled one database consisting of 88 different profiles at 199 different existing addresses. The premium of 37 insurers was calculated for each combination thereof. Since not every combination provides a match, this produces a database with 633,424 different liability insurance premiums. The profiles are combinations of the following characteristics:

Family situation:
- Single without children
- Single with children
- Family without children
- Family with children

Date of birth / age:
- 04APR1947 / 70
- 04APR1952 / 65
- 04APR1957 / 60
- 04APR1962 / 55
- 04APR1967 / 50
- 04APR1972 / 45
- 04APR1977 / 40
- 04APR1982 / 35
- 04APR1987 / 30
- 04APR1992 / 25
- 04APR1997 / 20

Start date
- 01JAN2017

Amount
- 1,000,000
- 2,500,000

Term life insurance

Three different types of insurance were considered for the term life insurance:

- Annuity reduction
- Unchanged
- Linear reduction

A database was created for each type based on profiles and based on real addresses. The profiles are the same for each different type of insurance. They were compiled based on the following variables:

First contracting party smokes / Second contracting party smokes

- Yes / n/a
- Yes / Yes
- No / n/a
- No / No

D.o.B 1st contracting party / D.o.B 2nd contracting party

- 01APR1942 / n/a
- 01APR1942 / 01APR1945
- 01APR1947 / n/a
- 01APR1947 / 01APR1950
- 01APR1952 / n/a
- 01APR1952 / 01APR1955
- 01APR1957 / n/a
- 01APR1957 / 01APR1960
- 01APR1962 / n/a
- 01APR1962 / 01APR1965
- 01APR1967 / n/a
- 01APR1967 / 01APR1970
- 01APR1972 / n/a
- 01APR1972 / 01APR1975
- 01APR1977 / n/a
- 01APR1977 / 01APR1980
- 01APR1982 / n/a
- 01APR1982 / 01APR1985
- 01APR1987 / n/a
- 01APR1987 / 01APR1990
- 01APR1992 / n/a
- 01APR1992 / 01APR1995

BMI 1st contracting party / BMI 2nd contracting party

- 22.8 / n/a
- 22.8 / 22.8

Capital 1st contracting party
- 50,000
- 100,000
- 150,000
- 200,000
- 250,000
- 300,000
- 400,000
- 500,000
- 600,000
- 700,000
- 800,000
- 900,000
- 1,000,000

Capital 2nd contracting party is not applicable or equal to capital of the 1st contracting party.

Postcode
- 1011AC

Start date
- 01APR2017

Duration in months
- 120
- 240
- 360

Period of premium payment
- Monthly

The profiles are always the options that belong to either one or two contracting parties. This produces a total of 1,716 profiles. For the annuity reduced and unchanged insurances, the premiums are calculated for these profiles at 45 insurers; for the linear reduced insurance, the premiums are calculated at 44 insurers. This produces a database of 77,220 premiums for the annuity reduced and unchanged insurances, and 75,504 for linear reduced insurances.

With respect to the postcodes, the premiums are calculated for 199 different postcode areas (4-digit code plus 2-letter code). For the annuity reduced and unchanged insurances, the premiums are calculated for these profiles at 45 insurers, for the linear reduced insurances, premiums are calculated at 44 insurers. This produces a database of 8955 premiums for the annuity reduced and unchanged insurances, and 8,756 for linear reduced insurances. The following variables were selected for the profile of the insured:

Number contracting parties:	1
Smokes:	No
Date of birth:	01APR1987
BMI:	22.8
Postcode:	2274 EX
Insured capital	150,000
Start date:	01APR2017
Duration in months:	360
Period of premium payment:	Monthly