ASPECTS OF RELIABILITY: THE 1:5 YEAR RATIO

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Summary

To a certain extent, victims of crimes tend to misplace their victimisation in time. In general the result is an over-reporting of recent crimes in victimisation studies. In this paper a first attempt is made to find a correlation between the extent of this over-reporting of recent crimes and the factual growth or decline in the crimes studied in the International Crime (Victim) Surveys of 1992 and 1989. For some crimes acceptable correlations are found, but much work still has to be done to develop an acceptable instrument for indicating growth or decline in crimes in a single victimisation survey.

About this paper

In this paper the problem is dealt with as follows. After an introduction to the problems of retrospective surveys, the concept of the "unequal 1:5 year ratio" is described. This is followed by several theoretical explanations of this ratio. Next, an analysis of data is presented with the aim of developing an instrument in which use can be made of this ratio to predict growth or decline in crimes in single victimisation surveys.

Introduction

Inter/View, a Dutch marketing research company with a strong focus on international research, in which it has ample experience, has twice conducted and supervised research for the International Crime (Victim) Survey (ICS) in the industrialised countries. Fourteen countries participated in the 1989 ICS, and nine in the 1992 ICS. Six of these were also included in the previous wave. The author of this paper was involved with the technical and methodological aspects of both waves.

This paper is about a phenomenon which could be of interest to all those researchers who make use of what are called "retrospective surveys". Retrospective surveys are surveys in which information is gathered about past experiences based on the respondent's memory. The ICS is a good example of this type of survey. One aspect of the results of the first wave required attention because it suggested in a very pronounced way, the apparently invalid character of answers to retrospective questions. This aspect is what I would like to call the unequal 1:5 year ratio in

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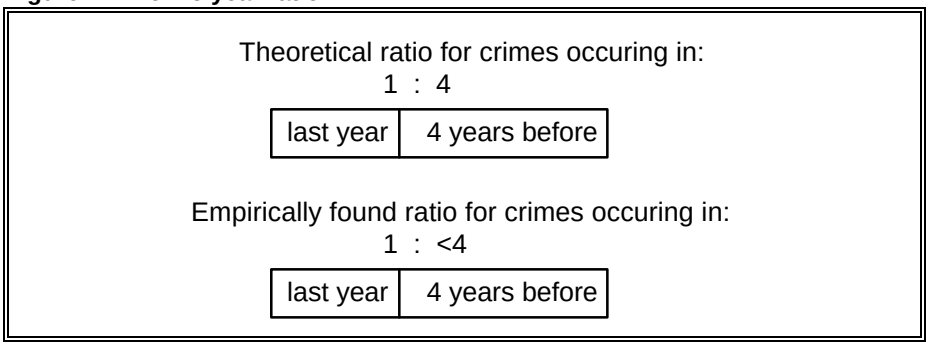
reported victimisation rates. When people are asked about the date of a crime they have experienced, they tend to give answers which seem to be unrealistic. Respondents answering positively to the question as to whether they had suffered a specific crime "during the past five years", tend to place this (last) crime in the previous year far more often than would be expected. This results in relatively higher victimisation rates for the last year, compared with the "5 year rates". Figure 1 illustrates this.

When crimes occur with roughly the same frequency over the years and respondents have an accurate memory, one would theoretically expect that crimes mentioned by the respondents would be spread equally over the whole five-year period; consequently the crimes committed over the last year would have a 20 percent share of the total number of crimes experienced in the last five years (see the top box in Figure 1).

However, there is an over-representation of the crimes of the last year in proportion to those of the preceding four years (see the bottom box in Figure 1). This is true in all countries and for all crimes. According to our respondents, not one-fifth, but about one-third of the crimes took place in the last year. This ratio differs for each crime.

Figure 1: The 1:5 year ratio



This raises several questions. Firstly, the rather straightforward question: why does this uneven 1:5 year ratio exist? Secondly, does it reflect overall invalid answering on retrospective questions? And thirdly, is it possible to use the uneven 1:5 year ratio for estimating growth or decline in the crimes under survey? This paper focuses on the third question.

Purpose of analysis

The purpose of our analysis is to use the information that is incorporated in different 1:5 year ratios to estimate growth or decline. In other words, the purpose is to infer knowledge about the dynamics of a crime from the observed 1:5 year ratio in one survey. In other words, to try to ascertain whether the ratio of crimes with a strong growth differ from that of crimes which are declining. If meaningful

deductions are arrived at, it makes sense to apply this knowledge: for instance, it would enable researchers to make decisions about the best intervals for repeat waves in longitudinal studies based on time dynamics.

To make use of the information incorporated in the 1:5 year ratio, several aspects which can explain the ratio must first be isolated.

Explanations

Several explanations are given in the literature for the unequal 1:5 ratio. Briefly, the following will be discussed:

1) telescoping effects;
2) forgetting;
3) multiple victimisation (within 5 years);
4) actual growth or decline of the phenomenon.

Each of these explanations has a different influence on the 1:5 ratio. The effects are summarised in Table 2.

The effects can be illustrated with the results of the International Victim Survey in the nine countries in which it was last carried out (1992), using CATI methodology. These countries are Australia, Belgium, Canada, England & Wales, Italy, the Netherlands, New Zealand, Sweden and the USA, with samples varying between 1,500 and 2,000 per wave per country. The questionnaire contained the following main questions on victimisation:

- theft of car;
- theft from car;
- car vandalism;
- theft of motorcycle;
- theft of bicycle;
- burglary with entry;
- attempted burglary;
- theft from garages and sheds (1992 only);
- robbery;
- personal theft;
- sexual incidents;
- assault.

Respondents were asked about the first eight crimes at the household level, and about the last four at the personal level.

The following information per crime is available:

- victimisation (last 5 years and last year);
- number of incidents in the last year (multiple victims);
- crime reported to police;
- seriousness of crime (1992 only);
- other details (place, damage, etc).

Possible explanations for the unequal 1:5 year ratio now follow.

Telescoping

Respondents to the questionnaire were asked if they had been the victim of a particular crime within the previous five years. In this respect, a recently published

study by Dr. van Dijk[2] reports on a so-called "record check" for a number of different crimes. The incidents which, according to respondents in a Dutch crime survey, had been reported to the police in the previous year, were checked with police records. The main conclusion arrived at was the verification of an overall telescoping effect of 25%. Thus, 25% of the answers reported as a "last year incident" were misplaced in time. Most of these victimisations occurred within the six months timespan which preceded the "last year". Similar results were found in an American survey[3]. This type of telescoping is called internal telescoping, because the telescoping effect occurs within the specified five-year timespan. The consequence of this internal telescoping effect is a substantial over-estimation of recent events, when the responses are taken at face value. In addition to this internal telescoping effect (within the five year period), external telescoping must also be mentioned here. Respondents tend to telescope into the five-year period incidents that occurred before this period[4]. The magnitude of the effect of external telescoping on victimisation surveys is not yet well known. Obviously it will lead to an over-representation of the crimes in the five-year period, but it probably does not greatly affect the "last year" period.

Forgetting

The second explanation for the unequal 1:5 year ratio is forgetting. Although much is still unknown about the functioning of the human memory, memory decay over time is a well documented phenomenon in cognitive psychology. In general this means that crimes which occurred in the more distant past tend to be more easily forgotten. This is expected to be especially true for less serious crimes[5]. Thus, this explanation would predict that crimes which the respondents situated in the last year will contain a lower proportion of "very serious" crimes than will be the case with more distant crimes. Figure 2 shows that this is the case with the current International Crime Survey.

The percentages of respondents evaluating a crime as very serious are shown in the figure. The blank bar displays crimes that occurred in 1991, while the shaded bar shows crimes experienced earlier.

Burglary is seen as the most serious crime and vandalism to cars as the least serious. For some crimes, the earlier experiences were more serious: theft of a car, sexual offences, assault and theft. This supports the explanation of forgetting less serious crimes. However, for the other crimes and for crime in general, this is not the case.

Influence of the act of reporting

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2 van Dijk, J.J.M. (1992) Als de dag van gisteren: over de betrouwbaarheid van het slachtofferverhaal, Justitiële Verkenningen 3, April, Kluwer, Deventer, the Netherlands.

3 van Dijk, Als de dag..., op.cit.

4 See Richard Block's chapter on Measuring victimisation risk: the effects of methodology, sampling and fielding.

5 Biderman A.D. and J.P. Lynch (1981) "Recency in data on self-reported victimization" in 1981 Proceedings of the Social Statistics Section of the American Statistical Association, p.38, Washington.

Going to the police could have a substantial impact on remembering the crime. Figure 3 is again based on the last survey. The length of the bars indicates the percentage of the crimes reported to the police. Theft of cars and motorbikes and burglaries are the most reported crimes from the set, but no striking differences are found between the percentages reported in 1991 and those before 1991. This also applies to differences per crime in reporting in and before 1991.

Figure 2: Seriousness of recent and older crimes

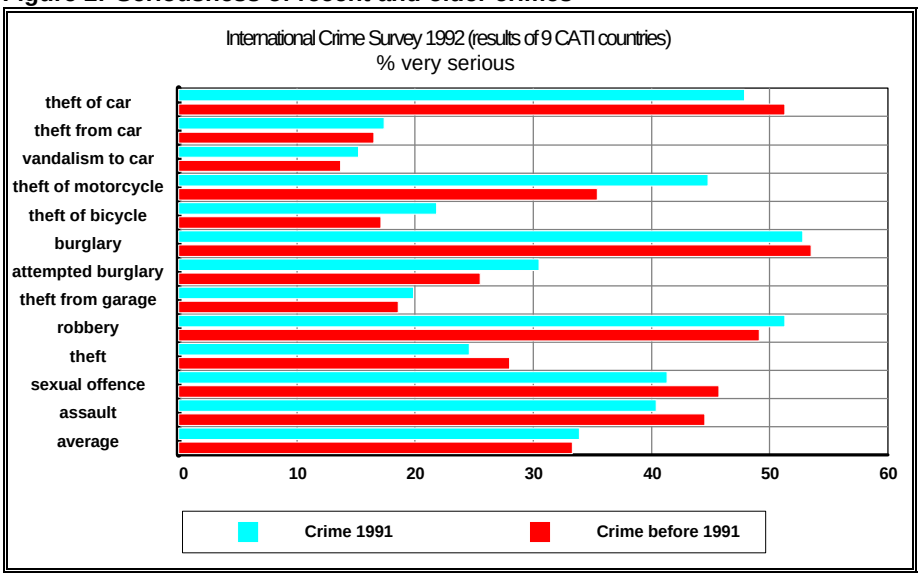
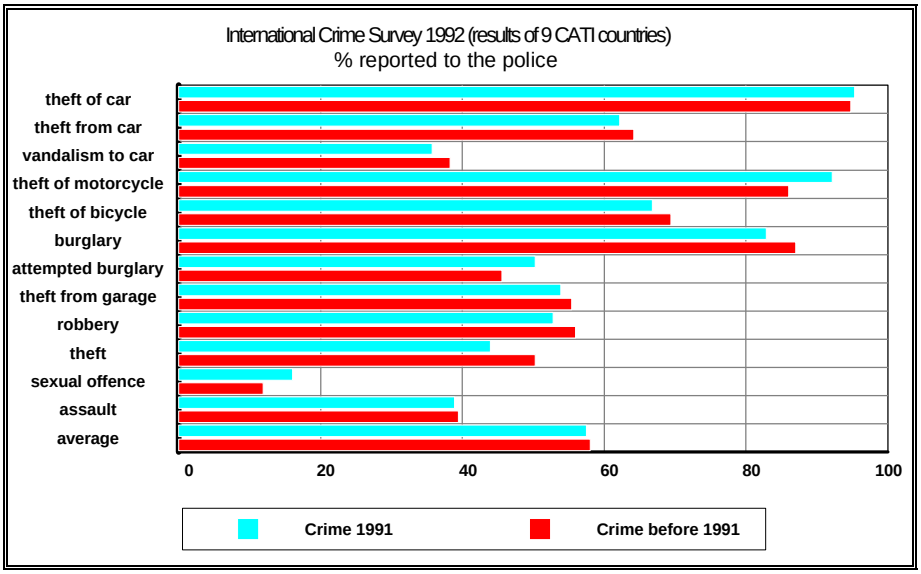


Figure 3: Reporting recent and older crimes to the police


International Crime Survey 1992 (results of 9 CATI countries)
% reported to the police
theft of car
theft from car
vandalism to car
theft of motorcycle
theft of bicycle
burglary
attempted burglary
theft from garage
robbery
theft
sexual offence
assault
average
0
20
40
60
80
100
Crime 1991
Crime before 1991

Unlike telescoping and selective memory, in the current survey multiple victimisation (third explanation) is not measured in the five-year period: that is to say, when a victimisation took place in the last year, previous incidents are not recorded. This measurement artefact has an effect on the theoretically expected 1:5 year ratio, which can be quantified in a statistical formula, as we shall see.

On the basis of the observed "last year" victimisation rate, the expected population victimisation rate for the five-year period can be calculated when:

1) the level of victimisation is constant over the 5 years;
2) all respondents have equal chances of becoming a victim[6].

The example in Table 1 illustrates this calculation. The example uses an observed "last year" victimisation risk of 10% and a sample of n=1000.

Table 1: Calculation example: 5 year victimisation

Year of victimisation	Total non-victims left in sample	Total victims (10% chance)
1991	1000	100
1990	900	90
1989	810	81
1988	729	73
1987	656	66
Totals	590 (59%)	410 (41%)

Thus, as can be seen, the theoretical chance of becoming a victim at least once in the last five years, when the victimisation rate in the last year is 10%, will not equal 50% (5 years x 10%) but 41%.

The theoretical chance of becoming a victim in the total 5 year period ('87 - '91), when the victimisation rate for the last year is known, can be expressed as follows:

Expected $P_{victim\ '87\text{-}'91}$ = 1 - (1 - Observed Pvictim '91) 5.[7]

This statistical formula reduces the 1:5 ratio to about 1:4 or less. It could even be 1:3, depending on the incidence rate found in 1991.

The last explanation to be mentioned here is the growth or decline of the phenomenon in real life. If the previous year's incidence rate increases, the ratio is of course affected. Table 2 summarises the possible consequences of the explanatory effects on the expected 1:5 year ratio.

The magnitude of the influence of the first aspects in Table 2 (telescoping and forgetting) on the 1:5 year ratio will differ per crime type. Knowing this, the question

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6 In fact, risks are not equally distributed amongst all population categories. The implications of this are of interest for further research.

7 van Dijk, Als de dag..., op.cit.

arises as to how to infer knowledge about growth or decline from differences in the 1:5 year ratio. In the following analysis an attempt is made to do this.

Table 2: Consequences of possible explanatory effects

Effect on the expected 1:5 year ratio	Crimes 'last year'	Crimes 'four years before'
Internal telescoping	+	-
External telescoping		+
Forgetting		
- in general	-	--
- less serious crimes	-- (?)	--- (?)
- crimes not reported to the police	-- (?)	--- (?)
Multiple victimisation (within 5 years)	+	-
Actual growth of the phenomenon	+	
Actual decline of the phenomenon	-	

Analysis

How did we proceed with the analysis? Six of the nine countries included in the 1992 International Crime Survey were also involved in the 1989 ICS, with standard questionnaires and CATI-methodology, and with samples varying between 1,500 and 2,000 per wave per country. These countries are Australia, Belgium, Canada, England & Wales, the Netherlands and the USA. The 1989 questionnaire contained similar questions on eleven of the twelve above-mentioned crimes for both waves (theft from garages was not included in the 1989 ICS).

On the basis of a comparison of the results per crime for the two waves, a growth index was calculated for each crime, for each country. This was done for the total five-year period and for the last year as well. An index of 100 means no growth, above 100 means growth, and less than 100 means a decline as regards the crime concerned. With the help of the previously mentioned statistical formula applied in correcting multiple victims on the expected 1:5 year ratios, 5-year risks were calculated for each crime in the 1992 ICS, for each country. Finally, a per crime per country calculation was made of the percentage of the expected 1:5 ratio observed in the data. Table 3 shows the average scores per crime for each of the variables constructed. (Appendix 1 gives a full description of the calculations).

The individual results per country were put in a data-matrix which served as input for a regression analysis, in which an effort was made to find the relation between the percentage realised of the 1:5 ratio for 1991 and the actual one-year or five-year growth indexes. In fact six cases were used for each crime (each country being a case).

Results

The resulting percentages in Table 3 explained the variance in growth indicators (R^2s).

The predictor sign is also placed next to the figures. A positive sign means that more growth correlated positively with a higher percentage obtained in the 1:5 ratio. This means that more crimes were found to have been committed further back in time in cases where actual growth happened. In this case the result is in the opposite direction from that expected. In general the percentages are not very high. In 6 cases, a R^2 has to reach a level of .53 or more to be significant at a 95% level. The only crime that reached this level is assault. For motorcycle theft and personal theft, substantial percentages for explained variance are also found. For all other crimes, no significant levels were reached.

Table 3: Results of the prediction of growth/decline with unequal 1:5 year ratio as predictor

Crime	R^2 growth index 5 years	R^2 growth index 1 year
Theft of car	.23 (-)	.04 (-)
Theft from car	.02 (+)	.06 (+)
Car vandalism	.14 (+)	.12 (+)
Theft of motorcycle	.45 (+)	n.a.
Theft of bicycle	.04 (-)	.30 (-)
Burglary with entry	.29 (+)	.05 (+)
Attempted burglary	.11 (+)	.07 (+)
Robbery	.07 (-)	.15 (-)
Personal theft	.15 (-)	.47 (-)
Sexual incidents	.03 (+)	.03 (+)
Assault	.88 (+)	.63 (+)

Discussion

The first attempt to use the unequal 1:5 year ratio to provide more information about the dynamics of crime has been only partly successful, mostly because of the limited number of countries involved in this analysis and the fact that the variation in growth/decline was not very high: most crimes showed moderate or strong growth.

Further work needs to be done to develop this instrument to enable researchers and policy-makers in the future to decide upon the frequency of repeat waves in multi-wave victim studies and to give additional interpretations to the underlying dynamics of the results of the first wave. Special care should be taken over differences in household crimes and personal crimes and on the effect of unequal victimisation chances between sub-groups in the population.

The fact that several crimes with correlations in the right direction were found in such a small sample gives hope that in the future it will be possible to derive additional information from the observed 1:5 year ratios based on one survey only.

Appendix 1

Calculation Example

Example 'Car theft'	Netherlands	England & Wales	Belgium	Canada	USA	Australia
A. % Victims last year (ICS'92)	.5	3.7	1	1.3	2.6	3.1
B. % Victims Expected in 5 years (ICS'92) according to formula	2.5	17.2	4.9	6.3	12.3	14.6
C. % Victims Observed 5 years (ICS'92)	2.1	9.8	3.7	3.9	7	10.4
D. Realised 1:5 year ratio (100* C/B)	85	57	75	62	57	71
E. % Victims last year (ICS'89)	.3	1.8	.8	.8	2.1	2.3
F. % Victims Observed 5 years (ICS'89)	1.8	6.6	4	2.8	6.3	8
G. Index 1 year growth (100*A/E)	167	206	125	163	124	135
H. Index 5 year growth (100*C/F)	117	148	93	139	111	130