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Towards an Irish Recorded Crime Index

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Abstract: Recorded crime statistics form an important component of criminal justice and social policy. Of equal importance as the number of crimes however, is measuring the seriousness of these crimes. The Irish Recorded Crime Index (IRCI) is a proposed method of measuring the level of recorded crime in Ireland, taking account of both the number of recorded crimes and the seriousness of these crimes. Using official Irish criminal justice administrative data and developed on a similar conceptual framework to Statistics Canada's Crime Severity Index (CSI), it combines both information on recorded crime (from the Garda Síochána PULSE system) and prison and courts sentencing data to produce a crime index. After investigation we have used a combination of the probability of imprisonment and the mean sentence length to derive a measure of the "seriousness" of each class of crime. The limitations of this Index as a measure of the overall 'impact' of crime on society are also discussed.

Keywords: crime, index, justice, Ireland.
JELs: C10, D63

1. INTRODUCTION

One of the most complex issues pertaining to recorded crime and its measurements is determining whether the level of crime on a society have increased or decreased over time. Counting crime is complicated: for example, there is no such thing as an average crime. Criminal offences, as defined in Irish Criminal Law[2] range from low-level road traffic infringements to homicides and sexual offences. The range of recorded crime in Ireland can also be seen in the Irish Crime Classification System (ICCS).[3]

Most serious criminal offences involve offences against the person (such as homicides and assaults) and crimes against property (such as burglaries and frauds) and feature victims, but most types of road traffic and social code offences may be considered as 'victimless' – apart from society itself, there is no injured party. Therefore, attempts to measure the overall impact of reported crime in a society can lead to unusual situations. For example, if there is a fall in the absolute recorded number of crimes against the person (such as homicides and assaults) and crimes against property (such as burglaries and frauds) but there is an increase of greater magnitude in road traffic offences such as speeding, has the problem of recorded crime in a society increased or decreased?

Considering the total amount of crimes recorded, the answer would be 'yes', but in terms of the actual perceived seriousness of crime in public opinion the answer would be 'no'. This divergence is exacerbated by reported levels of certain offence groups, such as road traffic offences, weapons and drug being driven by the level of enforcement applied against these offences. If more speeding drivers are caught (or knives confiscated) the number of recorded offences increases. A similar effect is not present for homicides, robberies or other crimes where an increase in enforcement is associated with a fall in reported rates. This leads to a situation where increased enforcement leads to a 'worsening' of recorded crime levels.

The Irish Recorded Crime Index (IRCI) is a proposed weight-based index of recorded crime in Ireland. The objective is to produce a single indicator figure that represents the extent and seriousness of recorded crime in

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[2] Office of the Attorney General "Irish Statute Book", Electronic Publication, Irish Government.
[3] Healy, G. "Irish Crime Classification System", Central Statistics Office, Ireland 2008

Ireland, as well as permitting the study of changes in crime trends over time. The figure integrates quarterly recorded crime figures with weights obtained from population data, courts and prison datasets.

The IRCI index is produced by combining recorded crime statistics as based on the Irish Crime Classification System-Quarterly (ICCSq)[4] with weights based on yearly population, and the mean sentence length, and sentencing probabilities for each offence type in the years 2008-2010. The ICCSq groups recorded offences into related groups (such as Group 01 Homicide) and produces a total for each such group.

This approach is based on the Canadian Crime Severity Index.[5] Since Prison Service release administrative data from the period 2008-2010 was available to the researcher, the base year chosen is 2008. A detailed discussion of the index methodology is included as well as results obtained for the period 2003 to 2013 using this index.

In Ireland, the Irish Central Statistics Office has the statutory obligation[6] to produce recorded crime statistics using Garda Síochána (Police) administrative data. The author of this methodology document is in charge of the Crime Section and is responsible for this task – and therefore undertook to use official statistical sources to develop the IRCI.

Section 2 discusses the methodology of the Irish Recorded Crime Index in detail. It also considers alternative approaches to measuring the level of crime in society while illustrating the limits of these approaches. In Section 3, the index is produced at a national and Garda-Regional level, for the years 2003 to 2013. Next, in Section 4, the index is validated by comparison with recorded crime figures for the corresponding time periods. In Section 5, further developments of the index are considered – in particular the possible linkage of the index with other socio-economic indicators over the relevant time period. Finally, Section 6 contains the paper's conclusions.

2. METHODOLOGY OF THE IRISH RECORDED CRIME INDEX

2.1 General issues in measuring the seriousness of crime

In the official measurement of crime, there are a number of challenges. The first is to determine the most appropriate counting unit/time for crime – should crimes be reported by the police (the number of reported offences) or at the stage where criminal proceedings commenced, or at the stage of conviction? Secondly, how strong is the link between the amount of crime that is reported to the authorities and the actual levels of crime? Thirdly, what is the most appropriate overall indicator/measure of crime in an official statistics framework?

Official crime statistics have a long history: Throughout much of the 19th Century, official crime statistics were centred around the counting of court proceedings. This however, has numerous limitations, as the American criminologist Thortsten Sellin cautioned[7] in 1931: 'The value of a crime for index purposes decreases as the distance from the crime itself in terms of procedure increases.' In other words, statistics based on the number of criminal proceedings ignore the great number of offences that are brought to the attention of the police but are not solved.

Therefore, a move towards counting the numbers of reported crime began in England and Wales in 1857 when the UK Parliamentary Papers began publishing "Crimes (indictable offences) known to the Police), followed by Ireland in 1864 and Scotland in 1868.'[8] This system continues to the present day. Since then most countries have adopted the idea that crimes reported to the police (sometimes termed recorded crimes or caseload data) are considered the counting units for official crime statistics. As the United Nations Statistics Division states:[9] 'Caseload data should be considered the basic building block in developing a national system of criminal justice statistics'. Statistics on recorded crimes will also be used for the construction of this index.

[4] The Irish Crime Classification System Quarterly (ICCSq) is used in "Quarterly Crime, Quarter 3, 2015", Central Statistics Office, 2015.
[5] Statistics Canada, "Measuring Crime in Canada: Introducing the Crime Severity Index and Improvements to the Uniform Crime Reporting Survey", 2009.
[6] The Garda Siochana Act, 2005 provides the legislative framework for the CSO to produce recorded Crime Statistics.
[7] J. Thorston Sellin – "The Basis of a Crime Index", American Institute of Criminal Law and Criminology No 22, 1931.
[8] "Judicial Statistics" (UK Parliament Departmental Committee on Criminal Statistics), series commencing 1857, sourced from Brian Mitchell "British Historical Statistics", University of Cambridge 1988.
[9] UN Statistics Division, "Manual for the Development of a System of Criminal Justice Statistics" pp 25, Studies in Methods, 2004.

Of course, there is a difference between the reported level of crime and the actual level of crime in a particular society. For example, not all crimes reported to police services are recorded.[10] More significantly, not every crime is reported to the authorities. The resulting difference between reported and actual crime levels is termed the "dark figure". Biderman & Reiss, and Ennis, both in 1967, brought the term to wider notice, though the issue was discussed as early as 1897 by Morrison.[11] Alternative methods, based on crime and victimization surveys, are used to capture part of this 'dark figure'. The classic example of such a survey is the National Crime Victimization Survey (NCVS) conducted by the Bureau of Justice Statistics in the United States.[12] The limitations of this approach will be discussed in Section 2.

2.2 The Proposed Irish Recorded Crime Index (IRCI)

2.2.1 Theoretical basis of IRCI

The IRCI can be considered as an Irish variation on the Canadian Crime Severity Index (CSI) which offers a solution that produces a total crime figure, but one that incorporates weights for reported crimes based on the seriousness of a crime (using prison length and likelihood of a prison sentence being issued as proxies, as well as adjusting for population).

Does the use of prison length and likelihood of being sentenced as a proxy for the seriousness of recorded crime have a sound basis in fact? Firstly, consider the term "seriousness". Maxfield and Babbie[13] note that the seriousness of a crime can be considered partly as 'the level of punishment' that can be permitted for particular offences. However, crime seriousness can also be considered in terms of public opinion. In terms of the relative seriousness of offences, Indermaur[14] noted that, for a Perth, Australia-based study, there was 'general agreement between the community, judges and the courts' about the 'relative seriousness' of particular crimes. However, there was less agreement between judges and the public on the appropriate length of sentences. Furthermore, public opinion on crime seriousness transcends borders: In Ireland, O'Connell and Whelan[15] studied the public opinion on the seriousness of offences had 'much in common with those in other jurisdictions.' To consider a US example, Spohn[16], in a study of US sentencing concluded that the seriousness of a crime is a major factor in determining the sentence length.

For a particular offence, the CSI uses the average sentence length issued court as the weight, multiplied by the probability of being sentenced for the offence. In the opinion of the authors, using sentence length multiplied by 'incarceration rate' as a weight is 'objective' and 'stable.'[17]

Weighted indices are usually used to measure either changes in prices or volume of goods produced. According to the United Nations System of National Accounts, a price index is used to measure changes in the prices of goods over time, whereas a volume index is used generally to measure changes in quantity produced.[18]

However, a crime severity index such as the CSI is actually a volume index.[19] The SNA defines a volume index as one where prices are kept constant over time, and the resulting index figure is the weighted average of the changes in volume of the "good". In the most general terms, a volume index which shows the changes between a particular year and a base year could be described as (**Eqn. 1**):

$$Volume\ Index = \frac{\sum_{(i=all\ goods)} volume_{year,i}.weights}{\sum_{(i=all\ goods)} volume_{byear,i}.weights}$$

[10] The CSO Report on the Quality of Recorded Crime Statistics and the Garda Inspectorate Report "Investigating Crime" provide more information on this.
[11] Biderman, A. & Reiss, A. "On exploring the "dark figure" of crime", Ennis, P. H, ""Criminal victimization in the United States: a report of a national survey". Morrison, W.D. "The Interpretation of Criminal Statistics,"
[12] Lauritsen, J, Rezey, M. "Measuring the Prevalence of Crime with the National Crime Victimization Survey", Technical Report, US Department of Justice, 2013.
[13] M. and Babbie, E. "Research Methods for Criminal Justice and Criminology"
[14] Indermaur, D., "Crime Seriousness and Sentencing: A comparison of Court Practice and the perceptions of a sample of public and justices"
[15] O'Connell, M. and Whelan, A. "Taking Wrongs Seriously - Public Perception of Crime Seriousness"
[16] Spohn, C. "A Multi-Site Study of the effects of Race on Sentencing" cited in Spohn, C. "How Do Judges Decide: The Search for Fairness and Justice in Punishment",
[17] Babyak, C., Alavi, A. et al. "The Methodology of the Police-Reported Crime Severity Index
[18] For further information on Paasche and Laspeyres index, the United Nations "System of National Accounts", Ch. 15, 2008
[19] Babyak, C., Alavi, A. et al

Where *year* refers to the specified year, *byear* to the base year, *volume* to the volumes in either year, and *i* is a specific good.

In terms of the IRCI, the volume can be considered as the number (volume) of recorded offences of a specified type, while the weights represent the 'seriousness' of the offence. The design of an index is largely determined by the choice of weights.

To consider some common index design methodologies: A Paasche Volume Index would use current period seriousness weights (**Eqn. 2**):

$$CrimeIndex(Pa)_{year/baseyear} = \frac{\sum_{(i=all\ offence)} offencevolume_{yeari}.seriousness_{yeari}}{\sum_{(i=all\ offence)} offencevolume_{byeari}.seriousness_{yeari}}$$

Whereas a Laspeyres Index (Ly) [57] would use base period seriousness weights (**Eqn 3**):

$$CrimeIndex(Ly)_{year/baseyear} = \frac{\sum_{(i=all\ offence)} offencevolume_{yeari}.seriousness_{byeari}}{\sum_{(i=alloffenc)} offencevolume_{byeari}.seriousnessb_{yeari}}$$

However, in the case of the Canadian Crime Severity Index, there are some additional design considerations, which means that a Paasche or Laspeyres type index is not used.[20]

Firstly, the weights used are calculated based on five years of court and sentencing data, in particular, the likelihood of being sentenced to prison for a particular offence multiplied by the average sentence length for the offence. This is a different weight structure to either the Paasche or Laspeyres. Furthermore, they are also standardized by population figures, to adjust for any changes in population. It is necessary to adjust for population since the relationship between population size on crime levels has been demonstrated by researchers including Nolan[21] in 2004, and Chang, Choj et al in 2013.[22]

Therefore, the CSI index takes the form, **Eqn 4**:

$$CSI_{year/baseyear} = \frac{\sum_{(i=all\ offences)} ov_{year}.\left(avpl_{period,i}\right).(prpris_{period,i})/population_{year}}{\sum_{(i=all\ goods)} ov_{byear}.\left(avpl_{period,i}\right).(prpris_{period})/population_{byear}}$$

Where ov_{YEAR} refers to the offence volume in the specified year, $avpl_{period,i}$refers to the average sentence length for the weight period and specified offence, $prpris_{period,i}$ refers to the probability of being prisoned for a particular offence in the weight period, and $population_{YEAR}$ refers to the population in the specified year and offence.

Therefore, recorded crimes in a particular year would be weighted by a combination of sentence length and likelihood of sentence (representing the seriousness weight) and adjusted for population (using CSO census population estimates).

In this study, the sentencing data was based on information obtained on Irish Prison Service administrative data for committals (imprisonments) in the period 2008-2010, while the probability of sentencing data was obtained from a combination of court outcome data (number of convictions) and prison committal data (number of imprisonments).

(Note: A decision was made, at the development stage that the index be based on the quarterly crime report. As a result, minor road traffic offences which are produced by the CSO in an annual basis will not be considered in this analysis. The disadvantages of this decision are discussed in Section 3.4. However, this methodology can be extended to include road traffic offences as part of the annual publication since the committal probabilities for minor road traffic offences, and corresponding sentence length data, is also available for the relevant years.)

The period considered for the index is 2003-2013 inclusive. The year 2008 is the base year (index = 100). The rationale for the choice of 2008 is that it is also the beginning of the period that weights were constructed on (2008-2010).

[20] Babyak, C., Alavi, A. et al.
[21] Nolan, J. J "Establishing the statistical relationship between population size and UCR crime rate: Its impact and implications
[22] Chang, Y.S, Choi, S.B, Lee, J. and Jin, Won, "Population Size vs. Number of Crime - Is the Relationship Super-Linear?"

Another matter to note is that for certain offence groups, there is a very small number of cases from which weights and sentencing data can be inferred. In these cases, groups were combined (appendix A). In certain cases, outlier sentence data was encountered and certain assumptions were made – these are discussed in the following sections where relevant.

Data from four sources was required for the generation of the IRCI. Based on **Eqn 4**:

$$IRCI_{y/by} = \frac{\sum_{(i=all\ off)} rc_{y,i}.\left(avprisl_{2008-2010,i}\right).\left(prpris_{2008-2010,i}\right)/pop_y}{\sum_{(i=all\ off)} rc_{byear,i}.\left(avpl_{2008-2010,i}\right).\left(prpris_{2008-2010}\right)/pop_{by}}$$

Firstly, population data for each year from 2003 to 2012 were obtained from the CSO Census population estimates.[23] Furthermore, based on these national figures, figures for the six Garda Síochána (Police) Regional commands were also calculated, using the same methodology as is used in the Annual Report[24] for per-capita crime statistics. This corresponds to the pop_y and pop_{by} terms, where by = 2008.

Secondly, recorded crime figures were generated using the ICCSq classification. This methodology is based on 12-month annualised figures up to the most recent quarter. In this case, statistics for each year ending December 31st 2003 to 2013 were generated. The main advantage of 12-month annualised figures is that there is built-in seasonal adjustment. Seasonality can affect certain crime types, as Block noted.[25] The annual recorded crime figure for each component offence, in a particular year is $rc_{y,i}$.

Thirdly, imprisonment probability statistics were generated based on Police and Courts administrative datasets. These statistics, for the years 2008-2010, calculated for each offence type in the index, the probability of being sentenced to imprisonment, after being convicted in court proceedings resulting from such an offence. The reference period imprisonment probability for each offence is represented by $prpris_{2008-2010,i}$.

Finally, the average prison length for each offence in the group is $avprisl_{2008-2010,i}$ and is based on Irish Prison Service administrative datasets on committals in the period 2008-2010.

2.2.2 Assumptions and limitations of IRCI

Firstly, the assumption is made that the seriousness weights based on sentence and imprisonment probabilities in the period 2008-2010 are also applicable throughout the period 2003-2013. This is a reasonable assumption, since the legislative framework has not changed significantly over this period. This is not to preclude the possibility that if there are demonstrated changes in the sentencing policy for offences that the index could be rebased to adjust for any such changes. Secondly, as noted earlier, this index when using the quarterly Recorded Crime classification structure, most minor road traffic offences are not included. Thirdly, prior to 2007, most fireworks incidents were recorded under the Irish Crime Classification system as 11a Explosives and Chemical Weapons Offences, due to the lack of an appropriate indicator in the Garda PULSE system for fireworks offences. Therefore, when preparing this index, a decision was made to analyse and reclassify fireworks offences recorded prior to 2007 as Fireworks offences, rather than as Explosives offences. Given the major difference in terms of prison sentencing and committal probabilities for the two offence groups, this was a reasonable assumption.

The IRCI has numerous limitations. Firstly, since there can be a difference between reported and recorded crimes (due to the failure of Police to record crimes correctly), recorded crime is actually a subset of reported crime. Secondly, the Index is based on crimes reported to the Gardaí and then recorded, it cannot measure the dark figure as a C&V survey could. While it provides a measure of the seriousness of recorded crime (subject to the above assumptions), there is no provision in the methodology for measuring or incorporating victimisation information from non-administrative sources. Timing constraints are also present: Since detailed Police administrative data in the ICCSq format are not available prior to 2003, it is not possible to extend this index to the earlier Irish Criminal Justice environment.

2.3 Alternative approaches to measuring the seriousness of crime

2.3.1 The Headline Crime Figure

Similar to the Total recorded crime in England and Wales[26] and the US FBI's Uniformed Crime Report[27], this was the "traditional" approach to recorded crime statistics in the Republic of Ireland and was used during the

[23] CSO National Population Estimates sourced from CSO.IE
[24] Central Statistics Office, "Recorded Crime Statistics 2012"
[25] Block, C.R. "Is Crime Seasonal?"
[26] Office of National Statistics, "Crime in England and Wales, Year ending December 2013"
[27] "Uniform Crime Reporting Handbook", pp 8-13, US Department of Justice

period that An Garda Síochána (Police) was responsible for the production of recorded crime statistics in Ireland. Originally based on the selection of indictable offences, it was later expanded.

In effect, a total figure for 'headline crimes' was produced. There were significant offence types,[28] both in terms of volume and concern to the public and policy-makers, such as public order, minor assaults and criminal damage were not included in the 'Total Headline' figure. Therefore, the use of such an indicator gave an incentive for the re/mis-classification of offences. For example, the exclusion of 'criminal damage' from the figure meant that assigning an arson offence as a criminal damage offence would mean that the offence would not be included in the total figure. Exclusions of such significant groups meant that the overall figure could hardly claim to provide a full and accurate measure of recorded crime in Irish society. Finally, the headline crime figure was not a stable estimator, since certain groups included in the analysis are largely enforcement driven in their reporting rates [29] such as drug offences. A police campaign against drug-dealing would lead to a rise in drug offences, and thus a potential rise in the Headline crime figure. The headline indicator, therefore, could be seen as discouraging such police operations, in a target driven environment. This indicator would not take account of the 'dark figure'. For these reasons, it was decided not to use a Headline-type indicator to measure recorded crime.

2.3.2 The total recorded crime figure.

This is an alternative to the headline crime figure, based on the (current) ICCS classification system, but including a total crime figure. This would be produced on an annual basis, based on the annual ICCS, and would therefore include all recorded crime groups, and all penalty point offences. A total annual recorded crime figure would be calculated as the sum of all the offence groups. As before, the 'dark figure' could not be included.

The main advantage of this indicator is that it represents a true total recorded crime figure. All offences, regardless of their significance would be included. In addition, by retaining the ICCS structure, the sub-group totals (such as Group 01 Homicides) would be retained, allowing analysis of specific crime groups and subgroups. However, this indicator has a significant disadvantage. The inclusion of minor road traffic offences in a total figure makes the overall value problematic.

To consider the 2012 Annual Crime report[30] of the 686,636 recorded offences in 2012, over 440,000 (65%) were road traffic offences captured on the FCPS system. However, since this is an enforcement-led group (driven mainly by Police road safety campaigns), the number of road traffic offences recorded in a particular year can vary significantly, thus altering the total crime figure significantly. In 2011, for example, there were 524,651 road traffic offences captured on the FCPS system, with a total number of 776,143 recorded offences. Although serious offence groups including 01 Homicides, 02 Sexual offences, 07 Burglaries and 09 Frauds showed increases, the overall narrative of the indicator is a fall of 11.5%. Furthermore over 90% of this decrease can be attributed to falls in road traffic offences. Therefore, the Total Recorded Crime figure mainly provides information on road traffic enforcement. Therefore, the total recorded crime figure approach is rejected.

2.3.3 An alternative weighted index approach.

Another approach to a crime index design, capturing the public's opinion of offence seriousness, was Kwan's, Ip's and Kwan's[31] which developed utilised a method called Thurstone's law to compare pairs of criminal offences and determine the more serious and thus construct a relative ranking for crimes, based on 15 different offences. A telephone survey was carried out of 864 respondents,[32] requiring each to complete 28 'paired comparisons'.

In the case of the Kwan, Ip and Kwan index methodology design, the index can be expressed as (Eqn 5):

$$CrimeIndex(Pa)_{year/baseyear} = \frac{\sum_{(i=all\ offences)} offencevolume_{yeari}.th\_weight_{period}}{\sum_{(i=alloffences)} offencevolume_{byeari}.th\_weight_{periodi}}$$

Where th_weight_{period} refers to the weights generated via the Thurston pair survey process.

[28] Young P., O'Donnell, I and Clare, E. "Crime In Ireland Trends and Patterns 1950 to 1998"
[29] e.g. the variation in recorded drink driving offences in Irish Recorded Crime Statistics.
[30] Central Statistics Office, "Recorded Crime Statistics 2012" ibid.
[31] Kwan, Y.K, Wai, C.I, Kwan, P " A crime index with Thurstone's scaling of crime severity"
[32] Kwan, Y.K, Wai, C.I, Kwan, P " A crime index with Thurstone's scaling of crime severity" ibid.

Is an approach based on the Kwan, Ip and Kwan proposal feasible in an Irish official statistical environment?

The method produced a satisfactory weighted recorded crime index, and had the advantage of being based on the public perception of crime, and did not require courts and prison administrative data like the Canadian CSI.

This approach, as discussed in section 2.1 and 2.2 used Thurstone's Law of Comparative pairs, to construct weights for the seriousness of particular crimes. Thurstone's method, in its simplest form, states that a group of items can be ranked/weighted by "pairwise comparison" of individual pairs by a large number of respondents. However, the description of how this process was implemented by Kwan et al. demonstrates how it was not suitable.

Firstly, a considerable data collection exercise was required. Generating the ranking index in Kwan required a telephone survey of 864 respondents, which was conducted by ten interviewers. Unfortunately, the CSO does not conduct telephone surveys, and did not have the resources available for such staffing or to outsource such a data collection operation.

Next, for 15 crime types, each respondent was invited to rank one offence in comparison with each of 14 others. Weights were then assigned: For example, if nine out of ten respondents state that murder is more serious than assault, murder would be weighted 9 to assaults 1. This allowed a matrix to be constructed, with the ratios being the proportions of respondents stating that one item is more serious than another item.

In the case of the Kwan paper, the resulting matrix was a 15x15 (or 225 cell) one. However, in the case of the ICCS,[33] there are 49 subgroups and almost 160 different offences, which would involve a much greater and more complex weight generation process. A 49x49 or 160x160 matrix would be required, and each respondent would be required to rank one crime in comparison with 49 others (if ranked by subgroup) or 159 others (if ranked by offence). This was considered unfeasible, especially in the context of the telephone data collection operation that would be required.

2.3.4 Victimisation Surveys.

A victimisation-survey based approach has one main advantage in measuring the extent and implications of crime on society – it provides a measure for the 'dark figure' of unreported crime. The CSO's Crime and Victimisation Survey forms a major component of official crime statistics.[34]

These studies are not a panacea however and are particularly unsuited for measuring the seriousness of crime in society. Firstly, the Irish C+V is specifically excluded due to its design as a household survey module from conducting questions on domestic and sexual violence. Secondly, since crime is, as Schneider[35] terms it, 'a relatively rare event', a very large sample size is required to obtain statistically significant results. Thirdly, such surveys are prone to 'telescoping'. Fay and Li discuss the issue of telescoping in detail.[36] It is a phenomenon by which survey respondents misclassify the time period of a particular offence. In other words, a respondent may be asked a question about whether they were victimised in a particular time period. In this case, the respondent was not victimised in the current period, but mistakenly answers in the affirmative, because of an earlier victimisation, albeit one outside the period of reference.

Thirdly, another factor preventing victimisation surveys from superseding recorded crime figures is that they cannot measure offences where the victim is unable to report (most notably murders and crimes committed against children, since children are not included in victimisation surveys as respondents) or where there is no distinct victim per se. Groves et al.[37] discuss these differences in an American context in detail. The inability to measure 'victimless' crimes such as drug and weapons offences and the problems around attempts to measure sexual violence in a field survey were highlighted in the most recent EU SASU (Safety and Security Survey) Pilot[38] (as discussed by Dijk et al). Finally, the cost of running a survey with a sufficiently large sample size to achieve meaningful results means that these exercises are infrequent.

[33] Healy, G. "Irish Crime Classification System", ibid.
[34] Central Statistics Office, "Crime and Victimisation, 2010 – Quarterly National Household Survey"
[35] Schneider, A.L. "Methodological Problems in Victim Surveys and Their Implications for Research in Victimology",
[36] Fay, R.E., Li, J. "Effects of Unbounded Interviews, Time in Sample, and Recency on Reported Crimes in the National Crime Victimization Survey",
[37] Groves, Robert M. et al. "Surveying Victims: Options for Conducting the National Crime Victimization Survey",
[38] Van Dijk, J., Mayhew, P. et al. , "Final report on the study on crime victimisation"

As a result, it was decided that a victimisation survey would not be a suitable vehicle, in Ireland, for measuring recorded crime in Ireland and that a recorded crime index would be superior on grounds of coverage scope, timeliness, cost and accessibility of data.

3. GENERATION OF THE IRCI AT NATIONAL AND REGIONAL LEVELS.

Firstly, the national population estimates for each year 2003-2013 were obtained from the CSO Census directorate. Production of regional population estimates is a slightly more complex business – Garda (Police) regional boundaries do not correspond to any other geographical boundaries. Fortunately, the Census directorate issued regional population estimates for the period 2003-2011, based on Census data, and a linear extrapolation produced regional estimates for 2012 and 2013. See Table 1.

Table 1. National and Garda (Police) Regional Population Figures.

YEAR	Population of State	Northern Region	Western Region	Southern Region	Eastern Region	South Eastern Region	Dublin Metro Region
2003	3,979,900	449,870	509,674	752,338	669,464	494,429	1,104,125
2004	4,045,200	457,251	518,036	764,682	680,448	502,541	1,122,241
2005	4,133,800	467,266	529,382	781,431	695,352	513,548	1,146,821
2006	4,232,900	478,468	542,073	800,164	712,021	525,859	1,174,314
2007	4,339,000	490,461	555,661	820,221	729,868	539,040	1,203,749
2008	4,422,100	499,854	566,303	835,930	743,847	549,364	1,226,803
2009	4,459,300	504,059	571,066	842,962	750,104	553,985	1,237,123
2010	4,470,700	505,348	572,526	845,117	752,022	555,402	1,240,286
2011	4,586,977	518,491	587,417	867,097	771,581	569,847	1,272,544
2012	4,590,039	518,837	587,809	867,676	772,096	570,227	1,273,393
2013	4,593,102	519,183	588,201	868,255	772,611	570,608	1,274,243

While the regions do not correspond to the Irish Provinces or the EU NUTS region structures, they are comprised of the following Garda Divisions which share similar areas to the counties of the same name (Table 2). The regional data will be used to produce regional indices.

Table 2 Example Police Regions and their component divisions

Region	Divisions	Region	Divisions
Northern Region	Cavan/Monaghan	**Eastern Region**	Laois/Offaly
	Donegal		Meath
	Sligo/Leitrim		Wicklow
	Louth		Westmeath
			Kildare

The next step was the generation of sentencing probabilities. Based on Police and Courts administrative data for the year 2008-2010, an analysis was run to determine the overall number of convictions associated with each type of offence. Of these convictions, the percentage that lead to imprisonment (termed detention for juvenile offenders) was calculated - this provided the imprisonment probability for each offence.

Table 3. Probabilities of convictions leading to imprisonment.

Offence type	Imprison. Probability	Offence type	Imprison. Probability
01a Murder/Manslaughter/Infanticide	0.93	09a Fraud, deception and Related Offences	0.19
01d Dangerous driving leading to death	0.74	10a-b Importation/Cultivation or manufacture of drugs	0.40
02a-e Rape and Sexual Assault	0.87	10c Possession of drugs for sale or supply	0.43
02f Other sexual offences	0.77	10d Possession of drugs for personal use	0.04
03a-b Murder Attempts/threats	0.63	10e Other Drug Offences	0.18
03c Assault causing harm, poisoning	0.55	11a Explosives, Chemical Weapons offences	0.75
03d Other assault	0.35	11b-c Discharge/Possession of a firearm	0.51
03e Harassment and related offences	0.31	11d Offensive weapons offences (nec)	0.24
04a Dangerous driving causing serious bodily harm	0.45	11e Fireworks Offences	0.10
04b-c Driving under influence of drugs/alcohol	0.04	12a Arson	0.52
04f-j Other dangerous negligent acts	0.22	12b-c Criminal Damage/Litter	0.18
06a-d Robberies and Blackmail	0.79	13b Trespass offences	0.15
06e Carjacking, hijacking/unlawful seizure of of aircraft/vessel	0.88	13c-f Other Public Order	0.03
07a Aggravated burglary	0.77	15a Offences against Government and its agents	0.43
07b Burglary (not aggravated)	0.50	15b Organisation of crime and conspiracy to commit crime	0.40
07c Possession of an article (with intent to burgle, steal, demand)	0.37	15c Perverting the course of justice	0.26
08a Theft/Taking of vehicle and related offences	0.29	15d Offences in custody, breach of court orders	0.29
08b-d Theft from shop,other,person,stolen property	0.20		

As can be noted, the probability of offences leading to imprisonment differs significantly by offence group. Note that certain groups are aggregated due to low numbers. Table 4 shows the offences with the highest imprisonment probabilities for convictions and with the lowest.

Table 4 Highest and lowest imprisonment probabilities.

Offence type	Imprison. Probability	Offence type	Imprison. Probability
01a Murder/Infanticide/Infanticide	0.93	13b Trespass offences	0.15
06e Carjacking, highjacking/unlawful seizure of aircraft/vessel	0.88	11e Fireworks Offences	0.10
02a-e Rape and Sexual Assault	0.87	13a Disorderly conduct	0.06
06a-d Robberies and Blackmail	0.79	04b-c Driving under influence of drugs/alcohol	0.04
07a Aggravated burglary	0.77	10d Possession of drugs for personal use	0.04
02f Other sexual offences	0.77	13c-f Other Public Order	0.03

Certain of these probabilities are now discussed. Even crime categories such as 01a Murder/Manslaughter/Infanticide have suspended sentences, as highlighted by Lynch,[39] and do not have an imprisonment probability of 1. In the case of the low-imprisonment probability category 13c-f Other Public Order offences, this includes liquor licencing offences, begging, market trading and bookmaking offences which are usually dealt with via fines or other alternatives to imprisonment.

The next step is the calculation of the mean and median sentence length for these groups. As noted in Chapter 2, the sentence length is considered a strong proxy for the seriousness of an offence (when weighed by imprisonment probability).[40] Both the mean and median estimators were considered, though the mean was chosen in the final basis for constructing the seriousness weights.

Irish Prison Service committal data from 2008 to 2010 was analysed and both mean and median estimators for prison sentence length were obtained. The sentence length is the official sentence length assigned to each inmate's sentence. In the case of murders, there was an issue in assigning a sentence length. Under the Prison data, those imprisoned for murder were assigned a special life code and a numerical value of 14,610 days, or 40 years, which is used to represent a life sentence. Compared to the 17 years[41] that those imprisoned for murder serve in Ireland, on average, this would seem to be excessive. However, it was decided to adhere to this figure.

Firstly, the analysis is based on official sentence lengths, which refer the judgement of the court, rather than time served which also brings in factors not necessarily related to the seriousness of the offence, such as educational endeavours and behaviour in prison. Secondly, murderers in Ireland have served sentences of 45 years.[42]

As a result of this analysis, Table 5 was produced which shows the mean and median sentence weights obtained, with sentence length expressed in days.

[39] Lynch, M, "Analysis of Manslaughter Sentencing"
[40] Babyak, C., Alavi, A. et al.
[41] Parole Board of Ireland, 2012
[42] Mallon, C. "Longest Serving Prisoner to get out", Evening Herald, 1st May 2009.

Table 5 Mean and Median Sentence weights for 2008-2010 Committals.

Offence Type	Mean Sentence Length (days)	Median Sentence Length (Days)	Offence Type	Mean Sentence Length	Median Sentence Length
01a Murder/Manslaughter/ Infanticide	8289.09	5337	09a Fraud/Deception/ Related Offences	292.12	180
01d Dangerous Driving Leading to Death	882.43	731	10a-b Importation /Cultivation of drugs	886.45	731
02a-e Rape and Sexual Assault	1445.93	1095	10c Possession of drugs for sale or supply	1130.71	787
02f Other Sexual Offences	1013	911	10d Possession of drugs for personal use	511.27	195
03a Murder - Attempt/Threat	735.98	365	10e-f Other Drug Offences	297.92	120
03c Assault causing Harm/Poisoning	586.23	365	11a Explosives Chemical Weapons Offences	1841.5	2009
03d Other assault	325.57	153	11b Discharge/ Possession of a firearm	1284.14	1096
03e Harassment and related offences	499.52	365	11d Offensive Weapons Offences NEC	231.7	180
04a Dangerous Driving Causing Serious Bodily Harm	761.64	641	11e Fireworks Offences	7	7
04b-c Driving under influence of drugs/alcohol	125.6	120	12a Arson	764.75	730
04f-jOther dangerous and negligent acts	386.02	180	12bc Criminal Damage/Litter	236.49	180
05a-C False Imprisonment/ Abduction/ Human Trafficking	2130.63	1100	13a Disorderly Conduct	79.16	60
06a-d Robberies and Blackmail	852.29	731	13b Trespassing Offences	227.5	122.5
06e Carjacking/Hijacking /Unlawful Seizure	825.44	730.5	13cf Other Public Order Offences	193.43	123
07a Aggravated Burglary	1139.32	1096	15a Offences against govt. And agents	923.25	1141
07b Burglary	364.58	240	15b Organisation of Crime and conspiracy to commit	461.55	180
07c Possession of Articles	229.78	181	15c Perverting the course of justice	639.69	540
08A Theft of/from MPV	311.74	210	15d Offences in custody, breach of court order	149.55	120
08b-d Theft from shop,other, person,stolen property	240.62	180			

Finally, recorded crime figures for the period 2003 to 2013 were generated based on the ICCSq. These were generated using the standard recorded crime counting rules. As noted earlier, road traffic offences were not produced. Table 6 shows the recorded crime figures for 2003-2013 for category 01a Murder/Manslaughter/Infanticide. See Appendix A.1. for overall recorded crime figures in this period.

Table 6 Recorded offences under Groups 01a-c Murder/Infanticide/Manslaughter

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Index Subgroups											
01a-c Murder/Infanticide/ Manslaughter	***51***	***45***	***65***	***70***	***85***	***55***	***60***	***58***	***45***	***60***	***55***

The next step is to calculate the index. Firstly, for each offence i, in each year y, the recorded crime figure for the year is divided by the population estimates for the year: $rc_{y,i}./pop_y$. This gives the recorded crime rate for the offence, per person. Table 7 shows this process for category 01a Murder/Manslaughter/Infanticide. Note: Since this figure is only used in intermediate calculations, it is not expressed in the more common per 1,000 or per 100,000**.**

Table 7 Calculation of Crime rate for category 01a Murder /Manslaughter/ Infanticide

Year	Population Estimate	01a-c Murder/ Infanticide / Manslaughter (see Appendix A.1)	Crime Rate per 1 capita
2003	3,979,900	51	0.000012814
2004	4,045,200	45	0.000011124
2005	4,133,800	65	0.000015724
2006	4,232,900	70	0.000016537
2007	4,339,000	85	0.000019590
2008	4,422,100	55	0.000012438
2009	4,459,300	60	0.000013455
2010	4,470,700	58	0.000012973
2011	4,586,977	45	0.000009810
2012	4,590,039	60	0.000013072
2013	4,593,102	55	0.000011974

Next, the mean sentence length for each offence over the period 2008-2010 is multiplied by the corresponding imprisonment probability over the same period. This produces a weighted average sentence length for each offence, corresponding to the term $(avprisl_{2008-2010,i}).(prpris_{2008-2010,i})$ in Equation 7.
Table 8 illustrates this process:

Table 8 Calculation of average sentence weighted by imprisonment prob.

Offence Categories	**Mean Sentence (Days)**	**Imprisonment Probability**	**Average Sentence weighted by Imprisonment Probability**
01a Murder/Manslaughter/Infanticide	8,289.09	**0.934**	7,741.05
01d Dangerous Driving Leading to Death	882.43	**0.741**	653.65
02a-e Rape and Sexual Assault	1,445.93	**0.867**	1,253.61
02f Other Sexual Offences	1,013.00	**0.769**	779.23
03a Murder - Attempt/Threat	735.98	**0.628**	461.94
.	.	.	.
.	.	.	.
.	.	.	.
13a Disorderly Conduct	79.16	**0.057**	4.50
13b Trespassing Offences	227.50	**0.149**	33.83
13cf Other Public Order Offences	193.43	**0.025**	4.93
15a Offences against govt. And agents	923.25	**0.433**	399.62
15b Organisation of Crime and conspiracy to commit	461.55	**0.400**	184.62
15c Perverting the course of justice	639.69	**0.263**	168.34
15d Offences while in custody, breach of court order	149.55	**0.286**	42.85

In the end, the mean figure was used in adherence with the Canadian methodology. The median indicator could also be used, if necessary as an alternative weight method.

The next stage was to combine the weighted average sentence length (as shown in Table 8) with the crime rate for each offence type. These were then summed to produce a total for each year. Since 2008 was chosen as the base year, the 2008 annual total would then form the base point of the index. In terms of Equation 7, this involved calculating the term $\sum_{(i=all\ off)} rc_{y,i}.(avprisl_{2008-2010,i}).(prpris_{2008-2010,i})/pop_y$
Calculation of this term for national figures are shown in Table 9 for the year 2003.

Table 9 Calculation of total weighted seriousness of crime figure for 2003 (base year).

Offence categories	**2008 Crime Rate (CR)**	**Weighted Avg. Sent -Seriousness**	**CR Weighted by seriousness**
Total Figure (Base of index)			**5.3419**
01a-c Murder/Infanticide/Manslaughter	1.281E-05	7,741.05	***0.09920***
01d Dangerous Driving Leading to Death	7.287E-06	653.65	***0.00476***
02a-e Rape and Sexual Assault	4.704E-04	1,253.61	***0.58965***
02f Other Sexual Offences	2.864E-05	779.23	***0.02232***
03a-b Murder - Attempt and threats	1.181E-05	461.94	***0.00546***
03c Assault causing Harm/Poisoning	9.905E-04	324.63	***0.32154***
03e Harassment and related offences	2.653E-04	155.19	***0.04118***
04a Dangerous Driving Causing Serious Harm	5.025E-06	341.42	***0.00172***
04b-c Driving under influence of drugs/alcohol	2.907E-03	4.91	***0.01426***
04F-j Other Dangerous/Negligent acts	9.623E-05	86.24	***0.00830***
05a False Impris./Abduction/Human Trafficking	2.437E-05	1,572.61	***0.03833***
06a-d Robbery of Person/Institution/Cash/ in trans	7.096E-04	671.14	***0.47622***
06e Carjacking/Hijacking/Unlawful Seizure	2.286E-05	725.39	***0.01659***
07a Aggravated Burglary	8.216E-05	878.63	***0.07219***
07b Burglary	6.334E-03	181.79	***1.15144***
07c Possession of Articles	5.553E-05	85.83	***0.00477***
08A Theft of/from MPV	4.043E-03	90.66	***0.36656***
08B Other theft/handling stolen property	1.441E-02	49.02	***0.70623***
09a Fraud/Deception/Related Offences	1.041E-03	56.61	***0.05893***
10ab Importation/Cultivation of drugs	2.714E-05	355.33	***0.00964***
10c Possession of drugs for sale or supply	5.822E-04	480.81	***0.27992***
10d Possession of drugs for personal use	1.622E-03	19.30	***0.03131***
10e Other Drug Offences	9.447E-05	53.92	***0.00509***
11a Explosives and Chemical Weapons Offences	3.266E-06	1,381.13	***0.00451***
11b-c Discharge/Possession of a firearm	1.467E-04	657.14	***0.09643***
11d Offensive Weapons Offences NEC	3.226E-04	55.93	***0.01804***
11e Fireworks	9.799E-06	0.67	***0.00001***
12a Arson	3.563E-04	399.00	***0.14216***
12bc Criminal Damage/Litter	8.194E-03	42.60	***0.34911***
13a Disorderly Conduct	9.464E-03	4.50	***0.04255***
13b Trespassing Offences	3.613E-04	33.83	***0.01222***
13cf Other Public Order Offences	1.521E-03	4.93	***0.00750***
15a Offences against govt. And agents	5.000E-05	399.62	***0.01998***
15b Organisation of Crime,conspiracy to commit	2.764E-06	184.62	***0.00051***
15c Perverting the course of justice	6.231E-05	168.34	***0.01049***
15d Offences while in custody, breach of court order	1.602E-03	42.85	***0.06865***

The same process is carried out for each year between 2004 and 2013.

Finally, the resulting figure for each year is divided by the base year figure obtained in Table 14, and multiplied by 100 to produce the Irish Recorded Crime Index for the period 2003-2013. This represents the calculation of :

$$IRCI_{y/by} = \frac{\sum_{(i=all\ off)} rc_{y,i}.\left(avprisl_{2008-2010,i}\right).(prpris_{2008-2010,i})/pop_y}{\sum_{(i=all\ off)} rc_{byear,i}.\left(avpl_{2008-2010,i}\right).(prpris_{2008-2010})/pop_{by}}$$

For each year. This process is demonstrated in Table 10.

Table 10 The final production of the Irish Recorded Crime Index

Year	Total figure crime rate weighted by seriousness	IRCI value (obtained by dividing by 2008 base year value)
2003	5.342	89.675
2004	5.199	87.285
2005	5.440	91.318
2006	5.513	92.556
2007	5.697	95.639
2008	***5.957***	***100.000***
2009	6.123	102.790
2010	6.313	105.971
2011	6.053	101.620
2012	5.870	98.549
2013	5.578	93.636

4. ANALYSIS OF THE IRCI AS A MEASURE OF THE SERIOUSNESS OF CRIME

4.1 Trends in the IRCI

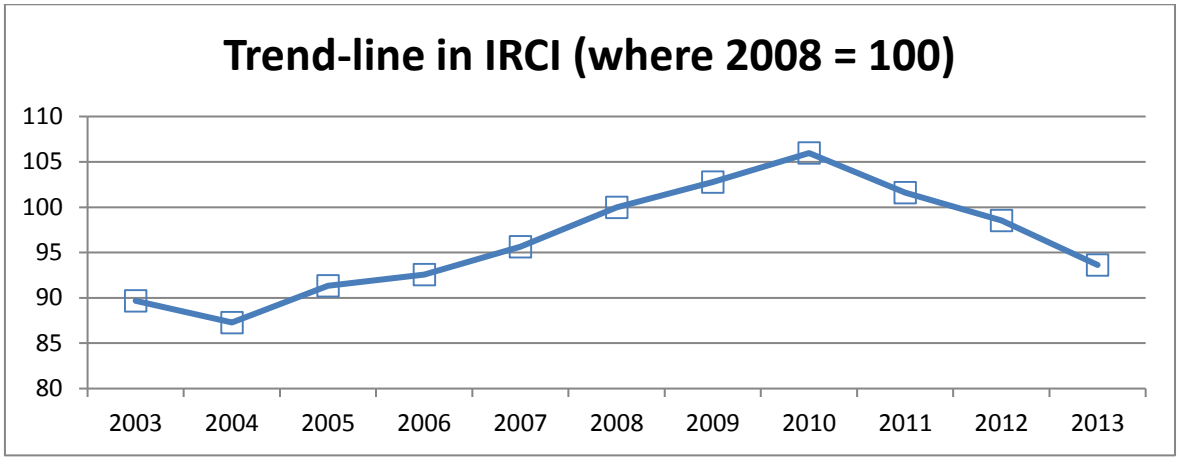
Table 11 in Section 3.3 shows the IRCI index for the republic of Ireland in the period 2003 to 2013, and the changes in the magnitude.

Table 11 Variations in the IRCI from the base year =2008.

Year	Total figure crime rate weighted by seriousness	IRCI value (obtained by dividing by 2008 base year value)	Difference between IRCI for year and base value=100
2003	5.342	**89.675**	***-10.325***
2004	5.199	**87.285**	***-12.715***
2005	5.440	**91.318**	***-8.682***
2006	5.513	**92.556**	***-7.444***
2007	5.697	**95.639**	***-4.361***
2008	5.957	**100.000**	***0.000***
2009	6.123	**102.790**	***2.790***
2010	6.313	**105.971**	***5.971***
2011	6.053	**101.620**	***1.620***
2012	5.870	**98.549**	***-1.451***
2013	5.578	**93.636**	***-6.364***

Figure 1 shows a graph of the index over the same period:

Figure 1. Trend-line for Irish Recorded Crime Index 2003-2013



As can be seen, the IRCI was higher than the base year of 2008 in the period 2009 to 2011. In 2012 and 2013 the index fell below the 2008 level, returning to the trend of the years 2003-2007. Therefore, the index shows an apparent rise in the seriousness of recorded crime in the period 2005-2010 but this is followed by a fall in the IRCI in 2011, 2012 and 2013. In fact 2013, the recorded crime level, as measured by the index, returned to almost the level of 2006. Sections 4.3 and 4.4 discusses the factors influencing these trends in detail.

4.2 The index generated for the Dublin Metropolitan Region

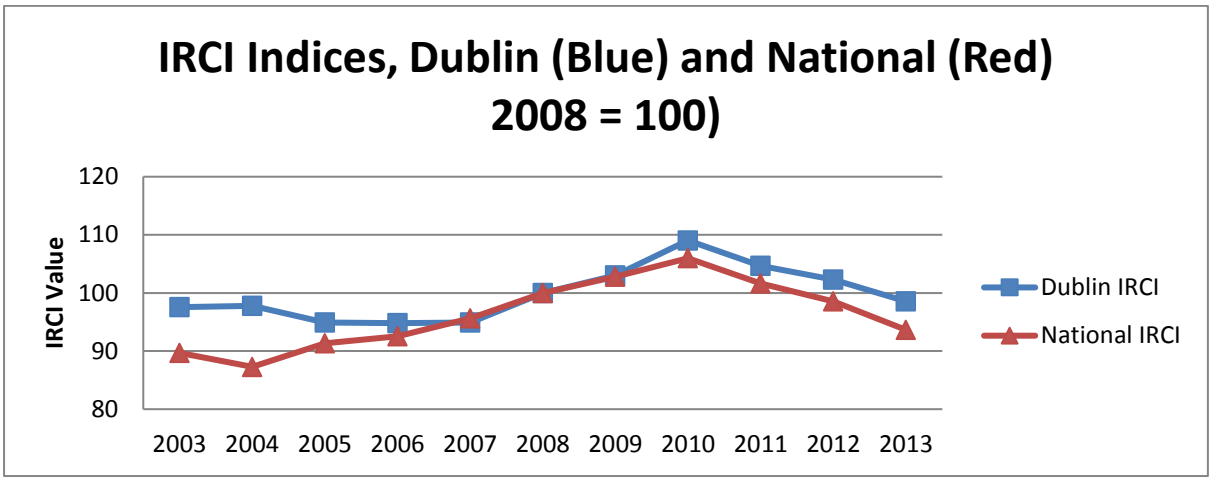
The index was also produced for the Dublin Metropolitan Region, which is the most populous of the Gardai regions and also the one with the highest reported crime rates for most offence categories. In this case, the crime rate was calculated using the Dublin Region population figures and the corresponding regional crime figures were used.

Table 12 shows the IRCI indices for Dublin in the period 2003-2013.

Table 12 Variations in the IRCI for Dublin region from the base year =2008.

Year	**Total figure crime rate weighted by seriousness**	**IRCI value (obtained by dividing by 2008 base year value)**	Difference between IRCI for year and base value=100
2003	8.528745865	97.5435843	***-2.456***
2004	8.546924413	97.75149303	***-2.249***
2005	8.29664277	94.88901256	***-5.111***
2006	8.289126133	94.8030445	***-5.197***
2007	8.29690961	94.89206441	***-5.108***
2008	8.74352314	100	***0.000***
2009	9.008243754	103.0276195	***3.028***
2010	9.533160667	109.0311138	***9.031***
2011	9.150613766	104.6559107	***4.656***
2012	8.944308166	102.2963858	***2.296***
2013	8.618886806	98.57452961	***-1.425***

Figure 2. Trend-line for IRCI index for Dublin Metropolitan Region (blue) and national (red).



It can be seen that the seriousness of crime in the Dublin Metropolitan region is higher than the national average over most of the time period 2003-2013. In 2003, when the national index value was 89.675, the corresponding value for Dublin was 97.54. Interestingly, in more recent years, the trends for Dublin and the nation are similar (upwards from 2007-2010, falling from 2011 onwards). However, Dublin shows a plateau between 2005 and 2007, at a time when the national IRCI figure is increasing significantly. These divergences will be explored further in Sections 4.3 and 4.4.

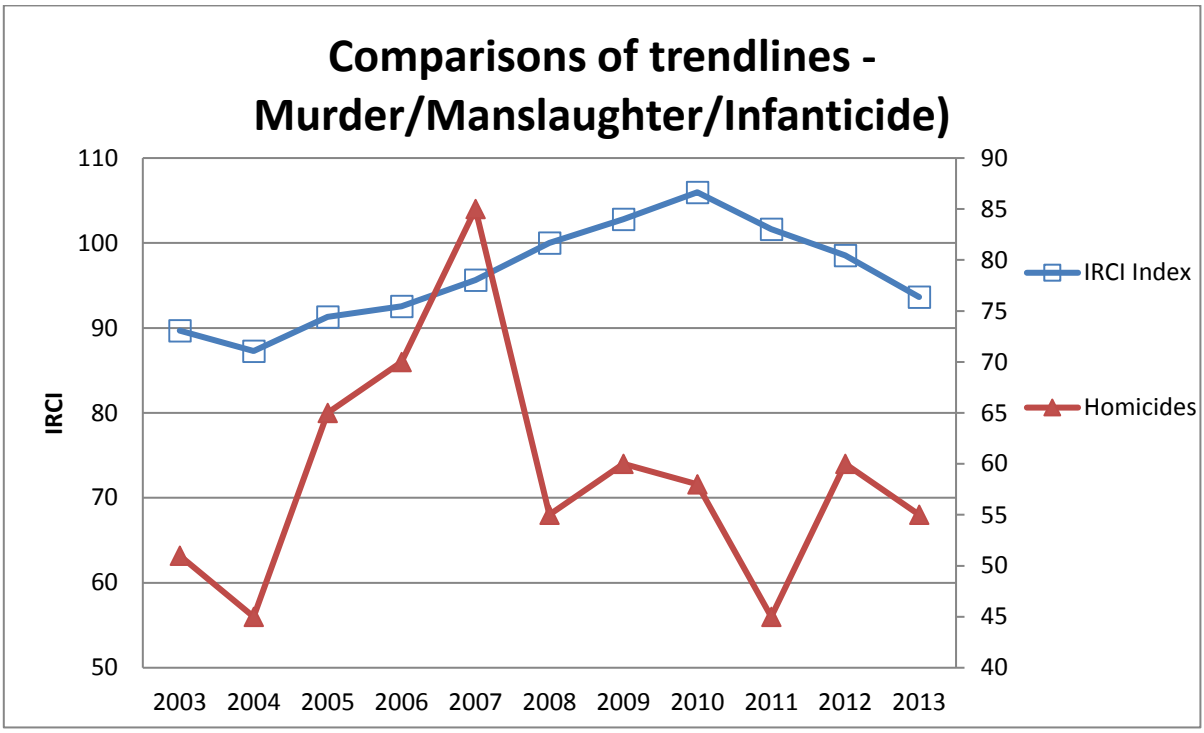
The IRCI for Dublin demonstrated how the index can applied to other geographical regions, not only at the national level. There is nothing to prevent the extension of the index to Divisional level. However, at smaller geographical levels such as Police station, it is not likely that the IRCI would be applied, due to the possibly small number of incidents and the policy of the CSO not to produce statistics reporting homicides and sexual offences at low geographical areas. Of course, this could be considered as a future development of the index.

4.3 Comparison of index with recorded crime for reference period

Initially, the relationship between the IRCI and some of the more serious offence groups were considered. This was an exploratory analysis, which was aimed at determining any obvious relationships between recorded (un-weighted) offence group figures and the overall index. The following, and more detailed, stage (Section 4.4) would be to study the weighted values of these groups and their influence on the IRCI.

Figure 3 compares the trends for the national IRCI and reported murders/manslaughters/infanticides in the period 2003-2013. This group has a weight of 7,741.05 (the highest weighted group, see Table 14). Note that there are two y-axes.

Figure 3. Comparison of trend-lines – Murder Manslaughter Infanticide and the IRCI.



The results are somewhat surprising, given the weight given to this offence category in the IRCI. 2007 was the year with the most recorded offences in this category (in fact since 1922), but was not a particularly high year in the IRCI series (IRCI for 2007 was 95.639). And 2010, the highest year in the IRCI was not a particularly high year for such offences, with 58 reported.

The next step is to consider the relationship between recorded sexual offences and the IRCI. Table 13 show this:

Table 13 Comparison of the IRCI and Recorded 02a-e Rape and Sexual Assault offences

Year	Total figure crime rate weighted by seriousness	IRCI value (obtained by dividing by 2008 base year value)	Difference between IRCI for year and base value=100	Total Rape and Sexual Assault
2003	5.342	**89.675**	***-10.325***	1,872
2004	5.199	**87.285**	***-12.715***	1,672
2005	5.440	**91.318**	***-8.682***	1,746
2006	5.513	**92.556**	***-7.444***	1,360
2007	5.697	**95.639**	***-4.361***	1,267
2008	5.957	**100.000**	***0.000***	1,334
2009	6.123	**102.790**	***2.790***	1,390
2010	6.313	**105.971**	***5.971***	2,189
2011	6.053	**101.620**	***1.620***	1,839
2012	5.870	**98.549**	***-1.451***	1,978
2013	5.578	**93.636**	***-6.364***	1,917

The highest year for recorded offences in this category (2010) corresponds to the highest IRCI index value (of 105.971). However, 2003 and 2013, which have relatively high levels of recorded sexual offences (1,872 and 1,917 respectively), are also years where the IRCI is well below the 2008 reference level – the IRCI had a value of 89.675 in 2003 and 93.636 in 2013. The absence of a clear relationship can also be seen for other groups.

Next the offence group 07b Burglaries were considered, (Table 14). This is a high-volume group with a weighted seriousness of 181.78. Over the period 2003-2013, the number of recorded offences ranged from a maximum of 27,097 in 2012 to a minimum of 23,052 in 2007. Yet, when considering the IRCI indices over the period 2003-2013, the year with the highest number of recorded burglaries (2012) is not a year with a higher-than-base IRCI index value (98.549 where year 2008 = 100), likewise the year with the lowest IRCI, 2007, was also the year with the lowest number of recorded burglary offences (23,052). Adding to the lack of a clear relationship: Other than 2012 the highest number of recorded 07b offences were recorded in 2009 (26,113) and 2011 (26,724), which were years with the third and second highest IRCI values over the period.

Table 14 Comparison of the IRCI and Recorded 07b Burglary (non-aggravated) offences

Year	Total figure crime rate weighted by seriousness	IRCI value (obtained by dividing by 2008 base year value)	Difference between IRCI for year and base value=100	Total Burglaries
2003	5.342	**89.675**	***-10.325***	25,208
2004	5.199	**87.285**	***-12.715***	24,430
2005	5.44	**91.318**	***-8.682***	25,911
2006	5.513	**92.556**	***-7.444***	24,270
2007	5.697	**95.639**	***-4.361***	23,052
2008	5.957	**100**	***0***	23,933
2009	6.123	**102.79**	***2.79***	26,113
2010	6.313	**105.971**	***5.971***	24,578
2011	6.053	**101.62**	***1.62***	26,724
2012	5.87	**98.549**	***-1.451***	27,097
2013	5.578	**93.636**	***-6.364***	25,136

Finally, a high-volume, low-weighted (4.53) group - 13a Disorderly Conduct is considered in terms of both its recorded levels and the IRCI for each year.

Table 15 Comparison of the IRCI and Recorded 13a Disorderly Conduct offences

Year	Total figure crime rate weighted by seriousness	IRCI value (obtained by dividing by 2008 base year value)	Difference between IRCI for year and base value=100	Total Disorderly Conduct
2003	5.342	**89.675**	***-10.325***	37,667
2004	5.199	**87.285**	***-12.715***	38,231
2005	5.44	**91.318**	***-8.682***	42,433
2006	5.513	**92.556**	***-7.444***	47,236
2007	5.697	**95.639**	***-4.361***	51,197
2008	5.957	**100**	***0***	53,419
2009	6.123	**102.79**	***2.79***	49,469
2010	6.313	**105.971**	***5.971***	47,346
2011	6.053	**101.62**	***1.62***	42,137
2012	5.87	**98.549**	***-1.451***	37,359
2013	5.578	**93.636**	***-6.364***	30,789

Again, for this group, there is no linear relationship between the number of recorded offences and the IRCI value for particular years. Both 2010, with the highest IRCI value (6.313) and 2006, with the lowest, have similar levels of recorded Disorderly Conduct offences, (47,346 and 47,236 respectively) while the base year of 2008 (IRCI = 100) has the highest number of recorded burglary offences (53,419).

The absence of a linear relationship simply demonstrates that the IRCI value for a particular year is a complex interaction of numerous weighted offences. The next step is to consider collectively the weighted offence groups that are most likely to be influencing the IRCI..

4.4 Factors influencing trends in the IRCI index.

A more precise way of studying the relationship between offence types and the IRCI is to examine the weighted offences in each year and the extent of their contribution to the IRCI. As an initial step, consider the year 2010 which had the highest IRCI value. The weighted offences (crime rate by seriousness) sorted by their weighted value (and contribution to), are shown in Table 14. The year's overall weighted crime seriousness figure is also included.

Table 16. Most and least influential terms, year of 2010.

Higher Influence (continued overleaf)	**Weighted value**	**% contrib. to value**	**Lower influence (continued overleaf)**	**Weighted value value**	**% contrib. to value**
Overall Index Crime Rate*Seriousness Weight	***6.313***	***100%***	**05a False Imprisonment/Abduction/Human Trafficking**	0.053	0.84%
07b Burglary (non-aggravated)	1.123	17.78%	**10ab Importation/Cultivation of drugs**	0.051	0.80%
08B Other theft/handling stolen property	0.748	11.85%	**11d Offensive Weapons Offences NEC**	0.043	0.68%
02a-e Rape and Sexual Assault	0.690	10.92%	**03a-b Murder - Attempt and threats**	0.043	0.67%
06a-d Robbery from Person/Institution/Cash/ in transit	0.518	8.21%	**15a Offences against govt. And agents**	0.037	0.58%
10c Possession of drugs for sale or supply	0.502	7.96%	**02f Other Sexual Offences**	0.035	0.55%
12bc Criminal Damage/Litter	0.394	6.24%	**13b Trespassing Offences**	0.032	0.51%
08A Theft of/from MPV	0.366	5.80%	**06e Carjacking/Hijacking/ Unlawful Seizure**	0.022	0.35%
03d Other assault	0.326	5.16%	**04F-j Other Dangerous/Negligent acts**	0.017	0.27%
03c Assault causing Harm/Poisoning	0.303	4.80%	**11a Explosives and Chemical Weapons Offences**	0.014	0.23%
12a Arson	0.259	4.11%	**04b-c Driving under influence of drugs/alcohol**	0.014	0.22%
	Weighted value	**% contrib. to IRCI**		**Weighted value value**	**% contrib. to value**
15d Offences while in custody, breach of court ord	0.118	1.86%	**07c Possession of Articles**	0.011	0.17%
01a-c Murder/Infanticide/Manslaughter	0.113	1.79%	**10e Other Drug Offences**	0.010	0.16%
11b-c Discharge/Possession of a firearm	0.098	1.55%	**01d Dangerous Driving Leading to Death**	0.005	0.08%
03e Harassment and related offences	0.090	1.42%	**13cf Other Public Order Offences**	**0.005**	**0.07%**
07a Agrgravated Burglary	0.074	1.16%	**15c Perverting the course of justice**	0.004	0.06%
09a Fraud/Deception/Related Offences	0.071	1.12%	**04a Dangerous Driving Causing Serious Bodily Harm**	0.002	0.02%
10d Possession of drugs for personal use	0.070	1.12%	**15b Organisation of Crime and conspiracy to commit**	0.001	0.01%
13a Disorderly Conduct	0.053	0.85%	**11e Fireworks**	0.000	0.00%

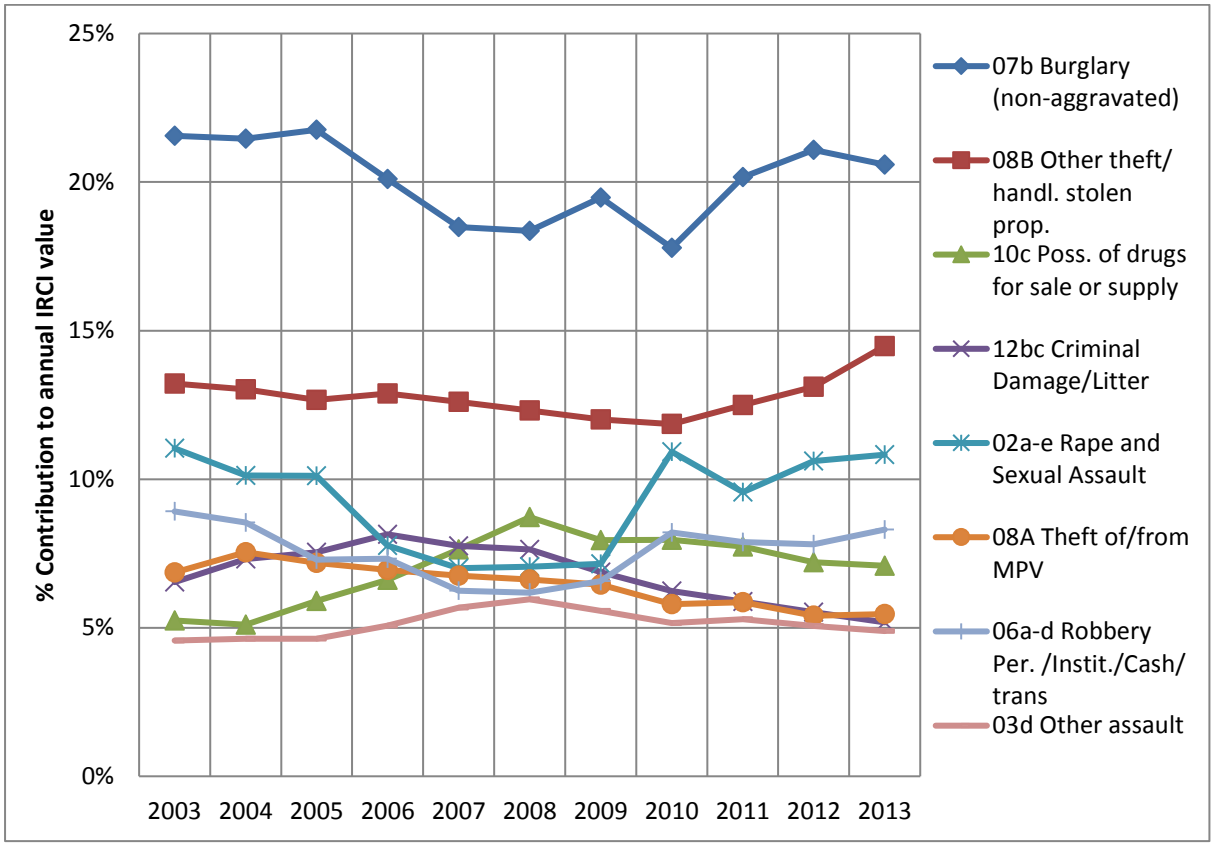
For 2010, that Burglary (non-aggravated) (17.78%), Other Theft (11.85%), Rape and sexual assault (10.92%) and Robberies (8.21%) are the offence that have the most influence on the IRCI, contributing almost 50% of the IRCI value for 2010. However, these groups differ in their characteristics.

Other Theft and Burglary (non-aggravated) are high-volume, low-seriousness offences, while rape and robbery (which cover all thefts involving violence) are much lower in volume but much higher in seriousness according to the IRCI.

Another item of interest is the relatively low influence of Murder/Manslaughter/Infanticide upon the index (1.79% contribution to the 2010 value), despite the high weighting of these offences. Also of note is the low influence of very low volume, high seriousness offences (Dangerous Driving Leading to Death/causing serious bodily harm and Organisation of Crime). A possible explanation for this is that Organisation of Crime offences are frequently associated with investigations into other criminal offences such as Robbery or Possession of Goods for Sale and Supply (another high influence group), and likely the primary offence counted (as per Irish Crime Counting Rules) would be the robbery or drug offence.

What is clear, however, is that certain offence groups dominate the index in that particular year. The next step was to consider the trends in these influences over time. Fig. 4 and Appendix A.1 show the percentage contributions of the offence types over the period 2003-2013, sorted by "influence". Note that these are rounded to one decimal point, so an offence with a value of 0 represents an influence of less than 0.05% on the annual IRCI value.

Figure 4. Plot of Trends in Most Influential Offence Groups 2003-2013.



The most influential eight groups accounted for a high percentage of the IRCI values in each year (for example 78% in 2003 and 77% in 2013, with a low point of 72% in 2007).

Throughout the period, Burglary (non-aggravated) is the offence type that exerts the most influence on the IRCI for each year. 22% of the 2003 IRCI figure was due to such offences in 2003, while the influence was less pronounced in the years 2007-2008 and 2010 (18%). This is due to both the high volume of recorded burglaries

(Table 11 shows that there were always over 20,000 recorded burglaries in a period), and the weighted average sentence length of around 181 days for offences of this type (Table 14).

In the case of 08b Other theft/handling stolen property offences, the influence has risen to 14% in most recent years, a rise driven by the increase in the number of recorded offences, from 57,000 in 2003 to 65,586 in 2013 (Table 14). This is a very high-volume group, covering most non-motor thefts, and has a weighted average sentence length of 49.02 days (Table 11).

The influence of 02a-e Rape and Sexual Assault offences have showed an unusual dynamic, falling from 11% of annual IRCI value in 2003 to 7% in the period 2007-2009 while rising again. It should be noted that there was a steep rise in reported sexual offences in the period 2010-2011, driven largely by historical cases being reported[43] in this period. These offences are medium volume (see Table 14) but have a high weighted average sentence length, which leads to their influence on the index. Historical incidents, regardless of the occurred date, are counted as of the reporting date in Irish recorded crime statistics (though an alternative approach, based on the occurred date could be suggested, if the purpose of the IRCI is to measure 'current' crimes).

What is evident is how certain groups dominate the IRCI by combining seriousness and volume. It is also worth noting the relatively low influence of 01a-c Murder/Manslaughter/ Infanticide offences on the overall index value, due to the relatively low numbers of such offences recorded in Ireland over the period 2003-2013. A similar trend can be observed for other high-seriousness but low volume offences such as 07a Aggravated Burglary offences and 02f Other Sexual Offences (which refer to other sexual offences such as incest and possession/distribution of child abuse imagery).

Furthermore, an example of a high volume but low-seriousness offence group with a low influence on the overall IRCI value for a particular year is Disorderly conduct, which, for example, accounted for 0.6% of the overall IRCI value for 2013.

Also of note is the highly muted influence of enforcement-driven offences such as 10d Possession of Drugs for Personal Use (consistently around 1% throughout 2003-2013), 11d Offensive Weapons Offences (nec) (which refers to possession of knives etc. and has a similarly low influence over the period) and 04b-c Driving under influence of drugs/alcohol.

These are offences with a low seriousness weighting, yet which reporting (unweighted) rates can be largely influenced by policing strategy. For example, a clampdown on personal drug use can greatly increase the number of recorded drug offences, but since there is a relatively low seriousness weighting, this ensures that the IRCI value for the year will not be greatly influenced merely by a change in policing policy on one offence type.

Therefore, the analysis shows that the IRCI is mainly influenced by high volume offences with medium-high seriousness weights. It also shows that the IRCI in its current form will not be affected to a significant extent by changes in policing strategy towards "enforcement-driven" offences.

5. LIMITATIONS OF THE IRCI AND FURTHER RESEARCH

While a useful tool for considering changing trends in the seriousness of recorded crime, there are numerous limitations to the IRCI that prevent it from being considered as a measure of the overall impact of crime upon society. These are now discussed, in conjunction with possible solutions.

Firstly, the IRCI does not take account of unreported crime - the 'dark figure' discussed earlier. This problem is exacerbated by the fact that non-reporting rates differ for different offence types. According to the Irish C&V Survey in 2010,[44] 75% of households experiencing burglary and 67% of households experiencing theft from vehicle reported these incidents to the Garda Síochána. This fell to 55% reporting rate for assaults and becomes particularly severe for Sexual offences: According to the 2013/2014 UK Office for National Statistics Crime Survey for England and Wales, only 17% of victims of serious sexual assault make reports to the police.[45] Therefore, some of the offences with the highest seriousness weights are most likely to be unreported, which is a serious limitation to the IRCI. It might be possible to use non-administrative data sources, and the Crime and Victimisation Survey, in order to determine the reporting rates for particular offence types. These rates could then

[43] "Quarterly Crime, Quarter 1, 2011", Central Statistics Office, 2011 contains a detailed explanation of this issue in its introduction.
[44] Central Statistics Office, "Crime and Victimisation, 2010 – Quarterly National Household Survey", Ireland 2010
[45] Office for National Statistics, "Findings from the 2013/2014 Crime Survey for England and Wales – Focus on Violent Crime and Sexual Offences – Chapter 4 Intimate Personal Violence and Serious Sexual Assault"

be used to adjust the reported number of offences of each type (if 50% of thefts are reported and there are 75,000 reported thefts in a year, for example, the figure of 150,000 could be said to incorporate the "dark figure" for thefts). These "adjusted" reported figures could then be used in conjunction with the seriousness weight to produce an Irish Crime Index that incorporates the 'dark figure'.

Secondly, the effects of crime upon society and individuals are wide-ranging and complex, as discussed by McCollister and French.[46] The costs of crimes against people involve may involve both mental and physical injuries to victims, while crimes against property involve may involve large monetary losses and increased operational costs in the form of insurance and security. While the use of sentencing data in the IRCI allows the seriousness of crimes be measured in a legal framework, it does not factor into account the views of citizens or their individual experiences of crime and its impact upon them. While addressing this limitation is beyond the scope of the report, the authors would note that the Kwan paper demonstrated a method for devising seriousness weights that took account of public perception. It would be interesting to see if a rough methodology could be developed (perhaps using the ICCS Group headings, since there are only 16), taking advantage of the Thurstone method. Such a study would require extensive funding though, in order to carry out a suitable telephone survey.

Thirdly, the IRCI in its current form cannot incorporate, or be applied to, Garda Síochána official statistics prior to 2003. The CSO does not have administrative data from the Garda Síochána prior to this period, and such data is not in a form that can be easily fitted to the Irish Crime Classification System. An exercise to achieve this could be attempted, but would also require historical sentencing and court outcome data in order to re-base the seriousness weights.

6. CONCLUSIONS

It became apparent that the Irish Recorded Crime Index, by applying the Canadian CSI concept, has been able to produce an index that demonstrates the changing nature of the problem of recorded crime on Irish society. Using data available to the researcher on courts and prison sentencing, it was possible to produce seriousness weights, and thus an index, that accurate demonstrated the changing (currently decreasing) extent of recorded crime in Ireland. The index is not affected by small changes in the recorded levels of offences, not matter how serious the offence (for example, Murder/Manslaughter/Infanticide). It is also not affected by changes in reported levels of 'enforcement-driven' offences such as possession of drugs for personal use, since the low weights assigned to such offences minimises the rise in recorded offences due to any change in policy. Therefore, it would be very difficult to "game" the IRCI.

Bibliography

Australian Bureau of Statistics, "Australian and New Zealand Standard Offence Classification", 3RD Ed. 2011

Babyak, C., Alavi, A. et al. "The Methodology of the Police-Reported Crime Severity Index", SSC Annual Meeting, June 2009.

Biderman, A. & Reiss, A. "On exploring the "dark figure" of crime". Annals of the American Academy of Political and Social Science, 1967

Block, C.R. "Is Crime Seasonal?", US Bureau of Justice Statistics, Department of Justice, 1984.

Blumstein, A., Seriousness weights in an index of crime", Carnegie Mellon University, 1974

Central Statistics Office, "Crime and Victimisation, 2010 – Quarterly National Household Survey", Ireland 2010

Central Statistics Office, "Interpreting Crime Statistics – A background Briefing Note", 2008

Central Statistics Office, "Quarterly Crime, Quarter 1, 2011", 2011

Central Statistics Office, The Irish Crime Classification System Quarterly (ICCSq) is used in "Quarterly Crime, Quarter 4, 2013"

Chang, Y.S, Choi, S.B, Lee, J. and Jin, Won, "Population Size vs. Number of Crime - Is the Relationship Super-Linear?" Gachon University, Workign Paper Series No. 13-2, 2013.

Crowley, P & Linehan, T, Central Statistics Office "Report on the Quality Statistics", June 2015.

[46] McCollister, K. French, M. The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation", Drug Alcohol Depend. 2010 Apr 1; 108 (1-2): 98–109.

Ennis, P. H, “"Criminal victimization in the United States: a report of a national survey". US Govt. Printing Office, 1967

Fay, R.E., Li, J. "Effects of Unbounded Interviews, Time in Sample, and Recency on Reported Crimes in the National Crime Victimization Survey", Proceedings of the Survey Research Methods Section 2010, Americal Statistical Society

Groves, Robert M. et al. "Surveying Victims: Options for Conducting the National Crime Victimization Survey", National Research Council, National Academies Press, 2008.

Healy, G. “Irish Crime Classification System”, Central Statistics Office, Ireland 2008

Indermaur, D., "Crime Seriousness and Sentencing: A comparison of Court Practice and the perceptions of a sample of public and justices", Criminology Research Council, Australia, 1990.

Kwan, Y.K, Wai, C.I, Kwan, P “ A crime index with Thurstone’s scaling of crime severity” Journal Of Criminal Justice No. 28, 2000.

Lauritsen, J, Rezey, M. “Measuring the Prevalence of Crime with the National Crime Victimization Survey”, Technical Report, US Department of Justice, 2013.

Lynch, M, “Analysis of Manslaughter Sentencing”, Judicial Researchers’ Office, Ireland 2013.

Mallon, C. “Longest Serving Prisoner to get out”, Evening Herald, 1st May 2009.

Maxfield, M. and Babbie, E. "Research Methods for Criminal Justice and Criminology", Cengage Learning, 2011

McCollister, K. French, M. The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation”, Drug Alcohol Depend. 2010 Apr 1; 108(1-2): 98–109.

Morrison, W.D. "The Interpretation of Criminal Statistics," Journal of the Royal Statistical Society, Vol.50, Part I (March 1897), pp. 1-24,

Nolan, J. J “Establishing the statistical relationship between population size and UCR crime rate: Its impact and implications”, Journal of Criminal Justice No. 32, pp 547-555, 2004.

O'Connell, M. and Whelan, A. "Taking Wrongs Seriously - Public Perception of Crime Seriousness", British Journal of Criminology, Vol. 36, No. 2, Spring 1996.

Office of National Statistics, “Crime in England and Wales, Year ending December 2013”, UK Government Publication, 2014.

Office for National Statistics, “Findings from the 2013/2014 Crime Survey for England and Wales – Focus on Violent Crime and Sexual Offences – Chapter 4 Intimate Personal Violence and Serious Sexual Assault”

Office of the Attorney General “Irish Statute Book”, Electronic Publication, Irish Government.

Office of the Director of Public Prosecutions (Ireland), “The Role of the DPP”, Government Publications

Schneider, A.L. "Methodological Problems in Victim Surveys and Their Implications for Research in Victimology", Journal of Criminal Law and Criminology, Volume 72, Issue 2, Summer 1981

Sellin, J – “The Basis of a Crime Index”, American Institute of Criminal Law and Criminology No 22, 1931.

Spohn, C. “A Multi-Site Study of the effects of Race on Sentencing” cited in Spohn, C. “How Do Judges Decide: The Search for Fairness and Justice in Punishment”, 2nd Ed., Ch. 3, pp 86-94, Sage Publications, 2009

Statistics Canada, “Measuring Crime in Canada: Introducing the Crime Severity Index and Improvements to the Uniform Crime Reporting Survey”, 2009.

Toland, M. & Garda Inspectorate “Investigating Crime” November 2014

UK Home Office, “Recorded Crime Statistics for England and Wales, 1898 – 2001/2002”, available at https://www.gov.uk/government/publications/historical-crime-data

UK Home Office, “User Guide to Home Office Crime Statistics”, UK Government Publication, 2011

UK Parliament “Judicial Statistics” (UK Parliament Departmental Committee on Criminal Statistics), series commencing 1857, sourced from Brian Mitchell “British Historical Statistics”, University of Cambridge 1988.

UK Statistics Authority, “Assessment of compliance with the Code of Practice for Official Statistics – Statistics on Crime in England and Wales”, UK Government Publicaiton, January 2014

UN Statistics Division, “Manual for the Development of a System of Criminal Justice Statistics” pp 25, Studies in Methods, 2004.

United Nations, “System of National Accounts”, Ch. 15, 2008.

US Department of Justice, “Uniform Crime Reporting Handbook”, pp 8-13, 2004.

Van Dijk, J., Mayhew, P. et al. , “Final report on the study on crime victimisation”, Intervict, Eurostat, 2010.

Young P., O’Donnell, I and Clare, E. “Crime in Ireland Trends and Patterns 1950 to 1998”, National Crime Council, Ireland

Appendix A.1. Recorded Crime Statistics for 2003-2012 classified under ICCSq

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Index Subgroups											
01a-c Murder/Infanticide/Manslaughter	***51***	***45***	***65***	***70***	***85***	***55***	***60***	***58***	***45***	***60***	***55***
01d Dangerous Driving Leading to Death	29	53	61	68	47	34	28	31	21	19	25
02a-e Rape and Sexual Assault	1,872	1,672	1,746	1,360	1,267	1,334	1,390	2,189	1,839	1,978	1,917
02f Other Sexual Offences	114	80	55	55	99	72	90	177	175	139	130
03a-b Murder - Attempt and threats	47	48	102	102	166	211	232	367	401	279	360
03c Assault causing Harm/Poisoning	3,942	3,892	3,708	4,014	3,911	3,850	3,733	3,713	3,584	3,231	3,036
03d Other assault	8,486	8,363	8,764	9,723	11,236	12,336	11,847	11,325	11,125	10,335	9,473
03e Harassment and related offences	1,056	974	1,113	1,615	2,353	2,753	2,541	2,298	1,952	1,865	1,467
04a Dangerous Driving Causing Serious Bodily Harm	20	29	22	24	25	17	18	18	13	5	12
04b-C Driving/In charge of a vehicle under influen	11,568	12,245	14,181	18,715	20,092	18,668	14,662	11,284	9,429	8,544	7,183
04f-j Other dangerous and negligent acts	383	412	517	541	892	902	852	791	504	502	457
05a False Imprisonment/Abduction/Human Trafficking	97	74	74	81	106	77	146	134	109	101	98
06a-d Robbery from Person/Instituion/Cash/ in tran	2,824	2,632	2,352	2,396	2,110	2,183	2,387	3,074	2,831	2,719	2,746
06e Carjacking/Hijacking/Unlawful Seizure	91	85	72	90	61	116	104	122	100	98	66
07a Aggravated Burglary	327	282	274	284	255	325	368	333	336	283	295
07b Burglary	25,208	24,430	25,911	24,270	23,052	23,933	26,113	24,578	26,724	27,097	25,136
07c Possession of Articles	221	201	196	234	296	424	429	509	635	752	684
08A Theft of/from MPV	16,091	17,218	17,142	16,808	16,877	17,331	17,342	16,065	15,563	13,925	13,368
08B Other theft/handling stolen property	57,344	54,983	55,935	57,688	58,311	59,530	59,689	60,762	61,412	62,477	65,586
09a Fraud/Deception/Related Offences	4,143	3,663	4,012	4,176	5,858	5,410	4,947	4,988	5,370	5,791	4,985
10ab Importation/Cultivation of drugs	108	74	86	135	215	285	319	567	621	547	434
10c Possession of drugs for sale or supply	2,317	2,196	2,659	3,016	3,602	4,301	4,029	4,159	3,874	3,503	3,272
10d Possession of drugs for personal use	6,455	7,138	10,037	10,468	14,007	18,093	16,817	14,523	12,674	11,823	11,212
10e Other Drug Offences	376	460	540	609	729	725	817	756	526	579	487
11a Explosives and Chemical Weapons Offences	13	20	36	39	26	50	46	41	78	90	59
11b-c Discharge/Possession of a firearm	584	665	746	722	750	681	647	592	457	393	357

Index Subgroup	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
11d Offensive Weapons Offences NEC	1,284	1,424	1,708	2,201	2,577	2,979	2,983	3,040	2,628	2,302	2,175
11e Fireworks	39	45	69	157	242	306	388	426	320	253	147
12a Arson	1,418	1,505	1,413	1,641	1,998	2,155	3,024	2,588	2,325	2,155	1,952
12b-c Criminal Damage (not arson)/ Litter	32,612	35,542	38,315	41,942	41,286	42,471	39,306	36,781	33,249	30,273	26,994
13a Disorderly Conduct	37,667	38,231	42,433	47,236	51,197	53,419	49,469	47,346	42,137	37,359	30,789
13b Trespassing Offences	1,438	1,565	1,842	2,355	3,002	3,675	3,793	3,786	3,580	3,335	2,947
13c-f Other Social Code Offences	6,055	7,993	11,207	7,025	6,384	4,726	4,089	3,809	3,343	3,168	2,643
15a Offences against govt. And agents	199	165	150	238	402	395	571	365	446	284	273
15b Organisation of Crime and conspiracy to commit	11	16	5	19	10	12	5	18	22	6	4
15c Perverting the course of justice	248	259	224	249	193	170	151	95	86	101	63
15d Offences while in custody, breach of court ord	6,377	6,013	7,413	8,976	10,395	12,701	11,171	10,920	9,619	9,054	8,400

Appendix A.1 Recorded Crime 2003-2013 - highlight 01a Murder/Manslaughter/Infanticide.

Appendix A.2 – Influence of offence groups upon the IRCI

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
07b Burglary (non-aggravated)	21.6 %	21.5 %	21.8 %	20.1 %	18.5 %	18.4 %	19.5 %	17.8 %	20.2 %	21.1 %	20.6 %
08B Other theft/ handl. stolen prop.	13.2 %	13.0 %	12.7 %	12.9 %	12.6 %	12.3 %	12.0 %	11.9 %	12.5 %	13.1 %	14.5 %
10c Poss. of drugs for sale or supply	5.2%	5.1%	5.9%	6.6%	7.6%	8.7%	7.9%	8.0%	7.7%	7.2%	7.1%
12bc Criminal Damage/Litter	6.5%	7.3%	7.5%	8.1%	7.8%	7.6%	6.9%	6.2%	5.9%	5.5%	5.2%
02a-e Rape and Sexual Assault	11.0 %	10.1 %	10.1 %	7.8%	7.0%	7.1%	7.2%	10.9 %	9.6%	10.6 %	10.8 %
08A Theft of/from MPV	6.9%	7.5%	7.2%	6.9%	6.7%	6.6%	6.5%	5.8%	5.9%	5.4%	5.5%
06a-d Robbery Per. /Instit./Cash/ trans	8.9%	8.5%	7.3%	7.3%	6.2%	6.2%	6.6%	8.2%	7.9%	7.8%	8.3%
03d Other assault	4.6%	4.6%	4.6%	5.1%	5.7%	6.0%	5.6%	5.2%	5.3%	5.1%	4.9%
03c Assault causing Harm/Poisoning	6.0%	6.1%	5.6%	5.9%	5.6%	5.3%	5.0%	4.8%	4.8%	4.5%	4.4%
12a Arson	2.7%	2.9%	2.6%	3.0%	3.5%	3.6%	5.0%	4.1%	3.9%	3.7%	3.5%
15d Offences while in custody, breach of court ord	1.3%	1.2%	1.5%	1.8%	2.0%	2.3%	2.0%	1.9%	1.7%	1.7%	1.6%
11b-c Discharge/Possession of a firearm	1.8%	2.1%	2.3%	2.2%	2.2%	1.9%	1.7%	1.5%	1.2%	1.1%	1.1%
03e Harassment and related offences	0.8%	0.7%	0.8%	1.1%	1.6%	1.8%	1.6%	1.4%	1.3%	1.2%	1.0%
01a-c Murder/Infanticide /Manslaughter	1.9%	1.7%	2.3%	2.5%	2.9%	1.8%	1.9%	1.8%	1.4%	2.0%	1.9%
10d Possession of drugs for personal use	0.6%	0.7%	0.9%	0.9%	1.2%	1.5%	1.3%	1.1%	1.0%	1.0%	1.0%
09a Fraud/Deception /Related Offences	1.1%	1.0%	1.0%	1.1%	1.5%	1.3%	1.1%	1.1%	1.3%	1.4%	1.3%
07a Aggravated Burglary	1.4%	1.2%	1.1%	1.1%	1.0%	1.2%	1.3%	1.2%	1.2%	1.1%	1.2%
13a Disorderly Conduct	0.8%	0.8%	0.9%	1.0%	1.0%	1.0%	0.9%	0.8%	0.8%	0.7%	0.6%
11d Offensive Weapons Offences NEC	0.3%	0.4%	0.4%	0.6%	0.6%	0.7%	0.7%	0.7%	0.6%	0.6%	0.5%
15a Offences against govt. and agents	0.4%	0.3%	0.3%	0.4%	0.7%	0.7%	0.9%	0.6%	0.7%	0.5%	0.5%

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
13b Trespassing Offences	0.2%	0.3%	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%
05a False Imprisonment/Abduction/ Human Trafficking	0.7%	0.6%	0.5%	0.6%	0.7%	0.5%	0.9%	0.8%	0.7%	0.7%	0.7%
10ab Importation/Cultivation of drugs	0.2%	0.1%	0.1%	0.2%	0.3%	0.4%	0.5%	0.8%	0.9%	0.8%	0.7%
03a-b Murder - Attempt and threats	0.1%	0.1%	0.2%	0.2%	0.3%	0.4%	0.4%	0.7%	0.8%	0.6%	0.7%
04b-c Driving under influence of drugs/alcohol	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.3%	0.2%	0.2%	0.2%	0.2%
06e Carjacking/Hijacking/Unlawful Seizure	0.3%	0.3%	0.2%	0.3%	0.2%	0.4%	0.3%	0.4%	0.3%	0.3%	0.2%
04F-j Other Dangerous/Negligent acts	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%
11a Explosives and Chemical Weapons Offences	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.2%	0.4%	0.5%	0.4%
02f Other Sexual Offences	0.4%	0.3%	0.2%	0.2%	0.3%	0.2%	0.3%	0.5%	0.6%	0.5%	0.5%
10e Other Drug Offences	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%
07c Possession of Articles	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%
15c Perverting the course of justice	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
13cf Other Public Order Offences	0.1%	0.2%	0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
01d Dangerous Driving Leading to Death	0.1%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
04a Dangerous Driving Causing Serious Bodily Harm	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15b Organisation of Crime and conspiracy to commit	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
11e Fireworks	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Appendix A.2 (ctd). Trends in most influential offence groups 2003-2013 and their % contribution to annual IRCI figure. Percentages are rounded.

DISCUSSION

Martin O'Brien: I wonder about the correlation between sentence length and the perceived seriousness of the crime in motivating the use of sentence length as weights in compiling the index. In arriving at a sentence length a judge considers not just the seriousness of the crime but also any mitigating factors that may pertain. Does this have any impact on the usefulness of sentence length as weights in this instance?

Noel O'Gorman: I commend Mr Linehan and his collaborators on the work that went into this paper, and Dr Singh for the important insights that he offered. He would encourage the interested authorities to publish the results of this research, while drawing attention to the qualifications attaching to (some of) the data. It was vital that public policy should be based on solid facts, preferably on quantified data. Without such hard information, public debate about crime and enforcement would be based on whatever types of crime the media, or individual journalists, considered most newsworthy. I am reassured about the methodology by the analysis identifying the crime categories having most influence on the Index: Burglary, Theft, Rape & Sexual Assault and Robberies. My prior concern about whether 'enforcement-driven offences' could result in a bias in the Index was allayed by the fact that motoring offences were excluded and the finding that simple 'drug-possession' had only a minor influence on the value of the Index. I encourage the author to explore the question of Kwan-type weightings, using direct measures of public perception, from a limited survey of opinion.

Charles Larkin: Crime statistics typically begin as tools of police management and not for assessing the levels of recorded crime. Given the experience of NYPD Compstat, which I was personally worked with in the late 1990s, how do you deal with recording issues brought about by police management responses? For example, the differences between grand and petite larceny, with petite larceny generating more police activity yet is of less importance than grand larceny. Police management requirements brought about a change in enforcement that eventually resulted in a declaration of a line of police activities as unconstitutional for the NYPD. Also the matter of arrests and final prosecutions, the level of mismatch between crimes declared by the arresting officer and what is returned by the DPP and the impact on the reliability of the index.