

# Revisions made to the multipliers and unit costs of crime used in the Integrated Offender Management Value for Money Toolkit

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## 1. Introduction

Home Office Online Report 30/05 (HOOR 30/05) and Home Office Research Study 217 (HORS 217)<sup>1</sup> published estimated unit costs of a range of crime types for 1999/00 and 2003/04 respectively. These estimates are composed of three elements: costs incurred in anticipation of crime (such as security expenditure), as a consequence of crime (such as property stolen and emotional or physical impacts), and in response to crime (costs to the criminal justice system). The reports also calculated multipliers equal to the ratio of the estimated total number of crimes (usually taken from the British Crime Survey) to the number of comparable crimes recorded (by the police).

The break-even analysis<sup>2</sup> model in the Integrated Offender Management (IOM) Value for Money (VfM) Toolkit requires the use of both unit costs of crime and weights<sup>3</sup> based on the multipliers. Adjustments have been made to the published unit costs and multipliers to account for changes in the prices and volumes of total crime over time. They also incorporate a number of methodological improvements. This note explains these adjustments.

It should be borne in mind that the amendments outlined here do not represent a comprehensive update of the costs of crime figures. Instead, the revisions should be viewed as a pragmatic attempt to update the estimates in the interim period before a full update of the costs of crime is undertaken.

## 2. Revisions to the multipliers and unit costs

Details of the amendments that were made to the multipliers and the unit costs are set out below. The revised multipliers for 2010/11 and unit costs in 2010 prices can be found in Annex 1 and 2 respectively.

### Crimes against individuals and households

#### **Key changes**

- *There have been small changes to the multipliers for all crimes against individuals and households covered by HOOR 30/05 (except sexual*

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<sup>1</sup> HORS 217, published in 2000, presented the first estimates of the cost of crime in England and Wales. HOOR 30/05, published in 2005, then presented the results of the first set of updates to the original figures. These updates, however, only relate to the costs of crime against individuals and households. Please see these documents for a detailed discussion of the methodologies that underpin the estimated unit costs and multipliers.

<sup>2</sup> Break-even analysis is a form of economic evaluation that allows an assessment to be made of the additional positive outcomes required to justify the cost of a programme or project. To calculate the 'break-even' number of additional positive outcomes required (such as fewer crimes), the value of the outcomes and the cost of the programme must be known.

<sup>3</sup> Weights are used to apportion additional IOM spend in the breakeven analysis between selected crime types according to the relative *total* harm it is estimated they cause. Relative total harm is defined as the combination of total volume and unit cost for each crime type considered. As not all crime is recorded, multipliers are required to 'gross up' from recorded crime to total crime for each crime type.

offences). Generally the multipliers have remained relatively stable between 2003/04 and 2010/11.

- The adjusted unit costs of crime for all crimes against individuals and households are higher than those reported in HOOR 30/05 reflecting increases in prices and income.

### **Multipliers**

The multipliers for crimes against individuals and households presented in HOOR 30/05 were estimated on the comparable subset<sup>4</sup> of BCS and recorded crime data for 2003/04. New multipliers for all crimes against individuals and households (sexual offences are excluded: these are dealt with separately below) have been estimated for subsequent years using the same methodology. They are based upon the comparable subset of BCS and police recorded crime data relevant to the year in question.

### **Unit costs**

The most recent published unit cost estimates for crime against individuals and households from HOOR 30/05 are presented in 2003 prices. To make the IOM VfM Toolkit more accurately reflects the current costs of crime, the 2003 estimates of the unit costs of crime need to be revised upwards. These estimates have, therefore, been adjusted by uprating all the components of the costs to account for inflation with the exception of 'physical and emotional costs'. The physical and emotional cost components of the estimates were uprated by growth in nominal income per capita. The choice of nominal income per capita reflects evidence that, as average incomes grow, people value the costs of negative health impacts to a greater extent. This is in line with guidance in HM Treasury's Green Book.

One of the weaknesses of simply adjusting for inflation and income growth is that it does not account for changes in the underlying costs since 2003/04. For example, it would not account for any changes in the average costs of a particular crime arising due to changes in sentencing practices.

## **Burglary in a building other than a dwelling and selected crimes committed against commercial targets**

### **Key changes**

- New estimated multipliers for burglary in a building other than a dwelling remained relatively constant over time.
- For robbery of business property, non-household criminal damage and commercial vehicle thefts the same multiplier was assumed as for crimes committed against individuals and households.
- The estimated unit costs for robbery of business property, burglary in a building other than a dwelling, non-household criminal damage and commercial vehicle theft were all higher than previously published estimates due to increases in price and income.

### **Multipliers**

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<sup>4</sup> The comparable subset is a group of crimes that are recorded by the police and coded in the BCS in a way similar enough to be able to make comparisons.

The most recent published estimates for commercial crime multipliers are from 2000 (HORS 217). In order to update these, a different approach to that for crimes against individuals and households was required because the BCS does not cover commercial crime.

HORS 217 was able to draw upon the Commercial Victimization Survey (CVS) to estimate the total number of burglaries in a building other than a dwelling (“burglary other”) in 1999/00<sup>5</sup>. The ratio of the multiplier for burglary in a dwelling to the multiplier<sup>6</sup> for burglary other was calculated for the year 1999/00. Since updated multipliers for burglary in a dwelling have been calculated for more recent years as part of this exercise, the ratio between the two burglary multipliers in 1999/00 could be used to derive proxy multipliers for burglary other for later years. This was the only practical method available; it does however assume implicitly that the relative recording rates between the two crimes has remained the same since 1999/00.

HORS 217 did not generate estimated multipliers for commercial vehicle theft; instead, estimated total levels of victimisation were reported from the CVS for 1999/00. To update figures for the IOM VFM toolkit, it has been assumed that the multipliers for commercial vehicle thefts are the same as for vehicle theft offences against individuals and households. The multipliers for non household criminal damage and robbery of business property are also assumed to be the same as the multipliers for the equivalent personal crimes (as was the case in HORS 217).

### ***Unit costs***

An adjustment was made to the unit costs for each crime type – robbery of business property, non-household criminal damage and commercial vehicle theft – which assumed that the relative severity between the comparable commercial and the domestic crime types remained constant over time. The ratio of the unit cost of a commercial crime to the unit cost of a domestic crime for comparable crime types was applied to the updated unit cost of the domestic crime type estimated in HOOR 30/05 in order to derive the revised commercial unit cost in a given year’s prices. The same approach was followed for burglary other.

### ***Issues***

A lack of data on commercial crimes means that it has not been possible to produce a more robust update at this time. The adjustments made are, by necessity, based on a number of basic assumptions. In particular, the cost and multiplier ratios used in the adjustments are assumed to be constant over time. Applying the cost adjustment ratios to the costs of crimes against individuals and households from HOOR 30/05 also assumes that the methodological improvements made in that report would have had the same impact on crimes committed against commercial targets.

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<sup>5</sup> Burglary other is a broad offence category which includes burglary of commercial property but also sheds, garages and holiday camp chalets in some circumstances. See section 30A of the Home Office counting rules for more detail.

<sup>6</sup> This was derived in HORS 217 from the assumption that the under-recording rate for burglary not in a dwelling was half that in a dwelling (HORS 217, Table 2.2).

Any error in these assumptions will not unduly influence the accuracy of the IOM VfM Toolkit because of the relatively low volume and unit cost of commercial crime. A more robust update of the costs of crimes committed against commercial targets will only be possible when further data become available.

## **Shoplifting**

### **Key changes**

- *The multiplier for shoplifting offences has been revised down from 100 to 16.1 following the same methodology used in the Drug Harm Index (2005).*
- *Using a new methodology, the 'value of property stolen' component of the unit cost of shoplifting was estimated to be £58 per incident (2010 prices), £6 less than the previous estimate (in constant prices).*

### **Multiplier**

The multiplier for theft from a shop in HORS 217 was an assumption based upon a limited number of self-reported incidents summarised in Farrington (1999). A new multiplier has been estimated using an offender-based methodology based on self-reported shoplifting episodes. The revised methodology is in line with the method used to calculate the cost of shoplifting for use in the Drug Harm Index (2005).

The volume of shoplifting incidents is the sum of the number of incidents by arrestees and the number of incidents by non-arrestees. The number of incidents committed by arrestees has been estimated using data from the 2005/06 Arrestee Survey (AS). The number of incidents committed by non-arrestees has been estimated using data from the 2003 Offending, Crime and Justice Survey (OCJS). The volume of shoplifting episodes<sup>7</sup> has been adjusted to take account of co-offending using an estimated co-offending rate of 1.8 from Farrington (1999).

Although this represents the most substantial change reported in this paper, it is believed that the offender based approach used in the Drug Harm Index produces a considerably more robust estimate than the assumption used previously. The revision suggests that a greater proportion of shoplifting incidents is reported than was previously thought.

### **Unit Cost**

In HORS 217, each incident of theft from a shop was estimated to cost around £100. This comprised three categories of cost: the cost in anticipation of shoplifting; the cost as a consequence (the average value of stolen goods), and the cost in response. The updated unit cost figure presented here includes the cost in anticipation and in response to shoplifting, but assumes no change in these cost components, except to account for inflation. However a new methodology has been used to update the 'value of goods stolen' component.

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<sup>7</sup> Volume of shoplifting incidents = (mean no. of shopliftings per arrestee per year (AS) \* no of arrestees) + (mean no. of shopliftings per non arrestee (OCJS)) \* (total population – population of arrestees = population estimate of non-arrestees)

The victim-based approach of calculating unit cost (as applied in HORS 217) has been replaced by an offender-based approach, following the same approach as described for the multiplier. The new methodology measures the total value of goods stolen during shoplifting by arrestees and non-arrestees – from 2005/06 AS data and 2003 OCJS data respectively. The total value was divided by the number of shoplifting offences to derive an average value of goods stolen.

Finally, the average value of property stolen was uprated for inflation and added to the uprated costs in anticipation and in response to crime. This revised methodology does not account for changes in the underlying data used to estimate the costs in anticipation or response to shoplifting (such as changes to the costs resulting from increased security measures, after inflation).

## **Sexual offences**

### ***Key changes***

- *The new multiplier for sexual offences is 13.6. This is higher than the multiplier from HOOR 30/05 (5.2), mainly due to changes in the methodology rather than changes in recording rates.*
- *The unit cost from HOOR 30/05 was amended, resulting in a slightly lower estimate than the original. The change was only minor as the vast majority of the unit cost relates to the physical and emotional costs which did not change.*

### ***Multiplier***

The methodology used to estimate the sexual offences multiplier in HOOR 30/05 has been revised. In HOOR 30/05 the multiplier was based on research by Walby and Allen (2004) which used the 2001 BCS Intimate Partner Violence (IPV) self-completion module to estimate the total number of victims of sexual offences in England and Wales. Under the lower bound assumption that each victim experienced one sexual offence in the previous 12 months, an estimate of the total number of sexual offences was derived which could be compared with recorded crime to generate a multiplier. In order to ensure consistency with other multipliers, the approach adopted for HOOR 30/05 was to then scale the multiplier down in line with the multiplier for violence against the person to reflect changes in recording over time.

The availability of new data has allowed two main improvements to be made to this estimate. Firstly, more recent data from the 2008/09 BCS IPV module has been utilised. This revealed that the previous scaling method was imperfect in that trends in violence against the person and in sexual offences differed over time. The availability of up to date data means that this scaling approach is no longer necessary.

Secondly, disaggregation of some of the relevant recorded crime offence codes has allowed a more accurate comparable crime group to be used in constructing the multiplier. The new multiplier uses the 2008/09 BCS IPV module to estimate any victims of sexual offences in the last year (excluding those who were only a victim of indecent exposure) and divides this volume

by the comparable recorded crime volume (excluding offences against minors).

### ***Unit Cost***

A number of the components of the unit cost of sexual offences from HOOR 30/05 were estimated using a 'top down' approach – dividing total cost by the total volume of sexual offences. Since a better estimate for the sexual offences multiplier had become available, based on the improvements described above, it was decided for this update to backdate that multiplier to 2003 – the year to which HOOR 30/05 applied – leading to a better estimate of the total volume of sexual offences in that year. The total costs relating to the relevant components were then divided by the updated volume estimate to determine new component costs.

The physical and emotional unit costs, lost output unit costs and the costs to the health service remain unchanged as these costs were estimated using a 'bottom up' approach, which did not depend on the volume of total crimes. The amended 2003 unit cost was then updated for inflation or, where appropriate, for changes in nominal GDP per capita.

## **3. Summary**

The revisions detailed here have primarily been used to estimate updated costs of crime unit costs and multipliers for use in the IOM VfM Toolkit, but the updated figures can be used in other contexts. It should, however, be acknowledged that the adjustments, particularly those made to the cost estimates, are generally fairly basic. Most of the adjustments to the cost estimates only reflect changes in prices over time and do not account for changes in the underlying data. Very few revisions to either the unit costs or the multipliers reflect methodological improvements. In the most part, the revisions presented in this note should not be viewed as providing substantive updates of the costs of crime estimates or multipliers. However, given the limitations regarding the availability of suitable data, particularly in relation to non household offences, the revised estimates do present a pragmatic attempt to improve the estimates. It is hoped that, for crimes against individuals and households, a substantive update will be provided in the near future. An update of the costs of crimes committed against commercial targets will only be possible when further data become available.

## References

Brand et al (2000) 'The economic and social costs of crime'. Home Office Research Study 217. London: Home Office. Available at: <http://webarchive.nationalarchives.gov.uk/20110218135832/rds.homeoffice.gov.uk/rds/pdfs/hors217.pdf>

British Retail Consortium (1999) 'Retail Crime Survey 1998'. London: BRC.

Dubourg et al (2005) 'The economic and social costs of crime against individuals and households 2003/04'. Home Office Online Report 30/05. London: Home Office. Available at: <http://webarchive.nationalarchives.gov.uk/20100413151441/http://www.homeoffice.gov.uk/rds/pdfs05/rdsolr3005.pdf>

Farrington, D. P. (1999) 'Measuring, explaining and preventing shoplifting', *Security Journal*, 12(1), pp 9-27.

HM Treasury (2003) 'The Green Book: Appraisal and Evaluation in Central Government', London: TSO. Available at: [http://www.hm-treasury.gov.uk/data\\_greenbook\\_index.htm](http://www.hm-treasury.gov.uk/data_greenbook_index.htm)

Home Office 'Commercial Victimization Survey (1995)'. London: Home Office.

Home Office counting rules for burglary. With effect from April 2011. Available at: <http://www.homeoffice.gov.uk/publications/science-research-statistics/research-statistics/crime-research/counting-rules/count-burglary?view=Binary>

Walby, S. and Allen, J. (2004) 'Domestic violence, sexual assault and stalking: Findings from the British Crime Survey.' Home Office Research Study 276. London: The Home Office.

## Annex 1: Multipliers

Table A1 below sets out the most recent published multipliers for each crime type covered in the IOM VfM Toolkit, along with details of the adjustments made to each multiplier and the adjusted multiplier.

**Table A1: Previously published multipliers and updated multipliers**

Crime type	Previous multiplier	Adjustment	New multiplier	
Homicide <sup>1</sup>	1 (2003/04)	• Same as HOOR 30/05	1 (2010/11)	
Serious wounding <sup>1</sup>	1.8 (2003/04)	• Updated using most recent BCS and recorded crime data	1.5 (2010/11)	
Other wounding <sup>1</sup>	1.8 (2003/04)		1.5 (2010/11)	
Sexual offences <sup>1</sup>	5.2 (2003/04)	• Cost components that were estimated 'top down' adjusted to account for amended total volume of offences • Uprated physical and emotional cost for changes in nominal GDP per capita • All other components uprated for inflation	13.6 (2008/09)	
Common assault <sup>1</sup>	7.7 (2003/04)	• Updated using most recent BCS and recorded crime data	7.9 (2010/11)	
Robbery – personal <sup>1</sup>	3.7 (2003/04)		4.8 (2010/11)	
Burglary in a dwelling <sup>1</sup>	2.2 (2003/04)		2.8 (2010/11)	
Theft – not vehicle <sup>1</sup>	Various (2003/04)		Various (2010/11)	
Theft of vehicle <sup>1</sup>	1.2 (2003/04)		1.3 (2010/11)	
Theft from vehicle <sup>1</sup>	2.8 (2003/04)		3.5 (2010/11)	
Attempted vehicle theft <sup>1</sup>	2.2 (2003/04)		2.3 (2010/11)	
Criminal damage (personal) <sup>1</sup>	4.3 (2003/04)		5.9 (2010/11)	
Robbery – commercial <sup>2</sup>	5.8 (1999/00)		• Same as personal robbery	4.8 (2010/11)
Burglary not in a dwelling <sup>2</sup>	2.1 (1999/00)		• Ratio of multiplier for “burglary in a dwelling” to “burglary not in a dwelling” from HORS 217 applied to updated “burglary in a dwelling” multiplier	1.9 (2010/11)
Commercial – theft of vehicle <sup>2</sup>	N/A	• Same as domestic theft of a vehicle	1.3 (2010/11)	
Commercial – theft from vehicle <sup>2</sup>	N/A	• Same as domestic theft from a vehicle	3.5 (2010/11)	
Commercial – attempted vehicle theft <sup>2</sup>	N/A	• Same as domestic attempted vehicle theft	2.3 (2010/11)	
Shoplifting <sup>2</sup>	100 (1999/00)	• Re-estimated following offender based approach as used for the Drug Harm Index	16.1 (2010/11)	
Criminal damage (commercial) <sup>2</sup>	6.3 (1999/00)	• Same as domestic criminal damage	5.9 (2010/11)	

Notes: 1. Figures from HOOR 30/05    2. Figures from HORS 217

## Annex 2: Unit costs

Table A2 below sets out the most recent published unit cost for each crime type covered in the IOM VfM Toolkit, along with details of the adjustments made to each cost and the adjusted unit costs.

**Table A2: Previously published unit costs and updated unit costs**

Crime type	Previous unit cost	Adjustment	New unit cost (2010 prices)	
<b>Homicide</b> <sup>1</sup>	£1,458,97 (2003 prices)	<ul style="list-style-type: none"> <li>• Uprated physical and emotional cost for changes in nominal GDP per capita</li> <li>• All other components uprated for inflation</li> </ul>	£1,774,681	
<b>Serious wounding</b> <sup>1</sup>	£21,422 (2003 prices)		£25,747	
<b>Other wounding</b> <sup>1</sup>	£8,056 (2003 prices)		£9,790	
<b>Sexual offences</b> <sup>1</sup>	£31,438 (2003 prices)	<ul style="list-style-type: none"> <li>• Cost components that were estimated 'top down' adjusted to account for amended total volume of offences</li> <li>• Uprated physical and emotional cost for changes in nominal GDP per capita</li> <li>• All other components uprated for inflation</li> </ul>	£36,952	
<b>Common assault</b> <sup>1</sup>	£1,440 (2003 prices)	<ul style="list-style-type: none"> <li>• Uprated physical and emotional cost for changes in nominal GDP per capita</li> <li>• All other components uprated for inflation</li> </ul>	£1,750	
<b>Robbery – personal</b> <sup>1</sup>	£7,282 (2003 prices)		£8,810	
<b>Burglary in a dwelling</b> <sup>1</sup>	£3,268 (2003 prices)		£3,925	
<b>Theft – not vehicle</b> <sup>1</sup>	£634 (2003 prices)		£763	
<b>Theft of vehicle</b> <sup>1</sup>	£4,138 (2003 prices)		£4,970	
<b>Theft from vehicle</b> <sup>1</sup>	£858 (2003 prices)		£1,034	
<b>Attempted vehicle theft</b> <sup>1</sup>	£510 (2003 prices)		£617	
<b>Criminal damage (personal)</b> <sup>1</sup>	£866 (2003 prices)		£1,053	
<b>Robbery – commercial</b> <sup>2</sup>	£5,000 (1999 prices)		<ul style="list-style-type: none"> <li>• Ratio of costs of “robbery – commercial” to “robbery – personal” from HORS 217 applied to uprated “robbery – personal” unit cost</li> </ul>	£9,372
<b>Burglary not in a dwelling</b> <sup>2</sup>	£2,700 (1999 prices)		<ul style="list-style-type: none"> <li>• Ratio of costs of “burglary in a dwelling” to “burglary not in a dwelling” from HORS 217 applied to uprated “burglary in a dwelling” unit cost</li> </ul>	£4,608
<b>Commercial – theft of vehicle</b> <sup>2</sup>	£9,700 (1999 prices)	<ul style="list-style-type: none"> <li>• Ratio of costs of “domestic theft of vehicle” to “commercial theft of vehicle” from HORS 217 applied to uprated “domestic theft of vehicle” unit cost</li> </ul>	£10,043	
<b>Commercial – theft from vehicle</b> <sup>2</sup>	£700 (1999 prices)	<ul style="list-style-type: none"> <li>• Ratio of costs of “domestic theft from vehicle” to “commercial theft from vehicle” from HORS 217 applied to uprated “domestic theft from vehicle” unit cost</li> </ul>	£1,248	
<b>Commercial – attempted vehicle theft</b> <sup>2</sup>	N/A	<ul style="list-style-type: none"> <li>• Assumed to be the same as the unit cost of “domestic attempted vehicle theft”</li> </ul>	£617	
<b>Shoplifting</b> <sup>2</sup>	£100 (1999 prices)	<ul style="list-style-type: none"> <li>• Value of goods stolen re-estimated using offender based approach</li> <li>• All other components uprated for inflation</li> </ul>	£124	
<b>Criminal damage (commercial)</b> <sup>2</sup>	£890 (1999 prices)	<ul style="list-style-type: none"> <li>• Ratio of costs of “criminal damage – commercial” to “criminal damage – personal” from HORS 217 applied to uprated “criminal damage – personal” unit cost</li> </ul>	£1,838	

**Notes:** 1. Figures from HOOR 30/05    2. Figures from HORS 217