Home Office

Crime and the value of stolen goods

Research Report 81

Oliver Shaw, Nick Morgan, Irina Mineva, Jacqueline Hoare, and Rachel Stevenson

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Acknowledgements

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Contents

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Summary

- This paper uses the Crime Survey for England and Wales (CSEW) to investigate the value of stolen goods and its relationship to crime trends. The analysis aims to determine:
  - the types of stolen goods and their value, and how these have changed over time;
  - whether these changes have played a role in the crime drop since the mid-1990s;
  - the extent to which the value of goods affects what types of crimes are committed and which items stolen within these crime types;
  - whether there is a link between the value of stolen goods and the rate at which crime is reported to the police, i.e. are demands on the police and the wider criminal justice system affected by changes to the value of stolen goods?

- The total value of all stolen goods,[1] as reported by victims, was estimated to be £1.8bn in 2013/14. This has fallen from £6.9bn in 1995, a 74 per cent drop. There are two components to this. The *number* of thefts with loss has fallen by about 60 per cent. But this report shows that the average value of stolen goods from a single theft has also fallen, by about 35 per cent. In other words, the overall economic harm to victims from theft has probably declined by an even greater amount than the number of thefts.

- Although there are a number of crime types not fully covered by the CSEW, notably fraud, analysis here suggests that changes in the levels of plastic card fraud have not substantially offset the reduction in overall economic harm to victims.

- Theft of vehicles has been the biggest contributor to the fall in value of stolen goods between 1995 and 2013/14. This is due to both the large reduction in numbers of thefts (theft of vehicles is down by 88% since 1995) and a small fall in the mean value of the vehicles stolen.

- The distribution of criminal gains from theft is heavily skewed. In 2013/14, just 2 per cent of all thefts accounted for 46 per cent of the total value of goods stolen. This means that the mean value of goods stolen per theft is markedly higher than the median value, and that the latter better represents the typical criminal gain from any one incident of theft (bold highlighted in Table 5).

- There has been a high degree of stability in the types of items that are stolen. Cash is most frequently stolen with vehicle parts/accessories, the second most stolen item for every year in which the CSEW has run from 1981 to 2013/14. Of the items stolen that would feasibly be resold by a thief, just nine types of goods – vehicle parts/accessories, cars/vans, bicycles, stereo/hi-fi equipment, clothes, jewellery, tools, garden furniture and mobile phones – account for the top six most stolen items in every year. Value is clearly a factor in determining which goods are most stolen, but it is not the only factor.

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[1] Relevant offence categories in the CSEW datasets are: domestic burglary with loss, theft from the person, other theft of personal belongings, robbery, theft of and from vehicles, theft outside dwelling, theft from dwelling, and theft of bicycles. All monetary values in this report are inflation-adjusted to 2012/13 and therefore are comparable across years.

Accessibility and disposability are also important.

- Though generally stable, there are some discernible trends within the 'stolen goods mix'. Thefts of virtually all types of item have fallen in absolute terms, but the relative prominence of mobile phones and bikes as stolen goods has risen. The relative prominence of jewellery and garden furniture has stayed roughly constant, while that of stereo equipment, clothes and tools has fallen.

- For some stolen goods, there appears to be a relationship between shifts in the value of the good and its prominence within the 'stolen goods mix'. Increases in phone thefts correlate more closely with increases in the *value* of phones, than with increases in the *availability* of phones. Trends in metal theft and metal value also show a high degree of correlation and the decreasing prominence of clothes and stereos is matched by falls in the value of these items.

- Evidence that a fall in the value of steal-able goods has been a factor in the *overall* decline in theft since the 1990s is more mixed. The median value of stolen goods in a typical incident of theft has fallen by 15 per cent between 1995 and 2013/14. This may reflect declines in the value of typically stolen items, which may in turn have put some offenders off crime. But the falling trend in criminal gain has been quite volatile with periods of increase and decrease, whereas the crime drop has been consistent. And overall, the *typical* gain to the thief is not greatly different now compared with the crime peak, whereas crime has fallen hugely.

- Furthermore, value seems to have had only a small effect on trends in individual crime types. Theft from the person has fallen far less than other acquisitive crimes, which may be linked to the increase in the average value of goods stolen per incident, but the relationship between value of goods stolen and the numbers of crime breaks down for other crime types. In particular, the average value of stolen items from burglary has risen between 2000 and 2013/14, yet incidents have decreased.

- Overall then, these results are consistent with the hypothesis that the value of stolen goods mostly drives changes to the stolen goods mix – i.e. switching *between* different types of items stolen – rather than increases or decreases in the actual number of thefts.

- The analysis demonstrated a mixed relationship between value and reporting rates. It is certainly true that incidents involving higher value stolen goods are more likely to be reported. But there does not seem to be a strong relationship between *changes* in criminal gain and reporting rates over time. For example, while the average criminal gain from theft from the person has increased, and within each year it is the most costly thefts that get reported, reporting rates themselves have remained stable.

- This report has a number of policy implications. It demonstrates that changes to the *resale* value of different items can affect theft trends, even if value is not the most important driver of acquisitive crime overall. This is shown clearly by the case of iOS 7, Apple's more secure operating system, which seems to have dramatically altered the resale value of iPhones and also caused a marked fall in thefts. Hence, while policies or security innovations may not affect retail prices of goods, they *can* affect resale values and, by implication, the proceeds from theft.

1. Introduction

Theft of various kinds make up around half of all police recorded crime. Some of these thefts may be the result of mischief or hedonism, but many are committed solely for economic gain (Wilson, Sharp and Patterson, 2006). It is reasonable to assume, therefore, that the potential returns from thefts are an important driver of crime.

What items are stolen and the value of these items will determine how much income offenders receive from theft offences. Therefore, to understand whether, and how, the proceeds from crime are changing, it is helpful to look at trends in stolen goods. Specifically, this report aims to shed light on:

- the types of goods stolen and their value, and how these have changed over time;
- whether these changes have played a role in the crime drop since the mid-1990s;
- the extent to which the value of goods affects what types of crimes are committed   and which items are stolen within these crime types;
- whether there is a link between the value of stolen goods and the rate at which crime is reported to the police, i.e. are demands on the police and the wider criminal justice system affected by changes to the value of stolen goods?

Methodology

This paper uses Crime Survey for England and Wales (CSEW) data to assess both the levels of acquisitive crime and the value of items stolen. The offences covered are only those that result in a loss of personal belongings[2]. These are:

- domestic burglary with loss;
- theft from the person;
- other theft;
- robbery;
- theft of and from vehicles;
- other household theft; and
- theft of bicycles.

One advantage of using CSEW data rather than police recorded crime statistics is that the survey covers both crimes reported to the police and those that go unreported.

To address the aims outlined above, there would ideally be data on two different values for stolen goods. The first relates to the proceeds an offender could gain from particular stolen goods. This should align with the offender's motivations to steal particular types of good. The second is the loss to the victim. This aligns more to the economic harms of acquisitive crime, and potentially to the victim's propensity to report the theft to the police. The reason for distinguishing between these two values is that they will often be different – offenders usually sell/trade stolen goods for less than their actual worth (Sutton, 2008).

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[2]   This loss may be permanent or temporary, but the figures shown in this report assume that the loss is permanent.

While there is a reasonable amount of data on the victim-reported value, very little exists on the resale value, i.e. the value to the offender. There are only a handful of qualitative studies[3] in which offenders were asked about the resale value. So instead, this paper uses a number of sources as proxies for post-theft value, which are listed below. The choice of data sources is discussed in more detail in technical annex A.

- **Crime survey data on the victim's estimated *total* replacement value of all goods taken in an incident of theft.** This is the primary data source for calculating the value of loss to the victim, and is also relied upon heavily as a proxy for the resale value of goods. The data are used for computing the average and total values of goods taken in incidents, but the values cannot accurately be broken down on a product-by-product basis (see technical annex A). For instance, while the average loss from a burglary can be calculated from the CSEW, the number of individual items stolen and their individual value is not known.
- **Average price data for particular products**, from the market research firm GfK. These are used to chart the relationship between thefts and retail values of particular products, such as mobile phones. The assumption is that the resale value on the stolen goods market directly reflects changes in retail value. However, this assumption does not always hold true for all goods, all of the time.
- **Price index data for baskets of goods.** This paper uses Consumer Price Index (CPI) data, which, among other things, charts the average price of defined groups of goods. This is used in the paper when the value of a *group* of goods, such as clothing, is examined. However, price indices are a problematic data source to use as a proxy for resale value (see technical annex A), so this source of data is used sparingly, and only when other sources are not available.

All values are inflation-adjusted to 2012/13 using the CPI, which allows for direct comparisons across time.

For a number of years in the 2000s the CSEW also included questions on whether respondents had been offered stolen goods. Analysis of these do not form a central part of this report, but findings can be found in Annex B. These corroborate the main conclusions from this research.

Previous research on characteristics of stolen goods, and the importance of value

Clarke (1999) identified six reasons to explain why certain goods are more attractive to steal than others. These form the acronym 'CRAVED' - the degree to which goods are:

- **c**oncealable;
- **r**emovable;
- **a**ccessible;
- **v**aluable;
- **e**njoyable;[4] and
- **d**isposable.

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[3]   See Stevenson and Forsythe (1998) and Sutton (2008).
[4]   If a stolen good is **resold** (the focus of this paper), looking at the extent to which it is 'enjoyable' is largely redundant as it is incorporated into its monetary value. It is reasonable to assume that a thief does not care how much enjoyment his or her end customer gains from the product, but rather how much this enjoyment converts into its resale value. But some items are stolen for the thief's own private consumption (for example, theft of alcohol, joyriding) in which case enjoyment should indeed be a separate consideration – but not one that will be focused on here.

There is a degree of interdependence and trade-off between these six factors. For instance, the extent to which a product is enjoyable may affect its value, and a product's value is likely to influence how securely it is kept, thereby affecting its accessibility to thieves.

A number of qualitative studies have shown that the acquisitive offenders' decision processes are accurately reflected by the CRAVED hypothesis. Through interviews with 50 prolific offenders in Shropshire, Schneider (2005) found that ease of disposal was the most commonly reported reason for stealing a particular item, followed by ease of theft and demand for the product. And a study in Australia found that burglars were most motivated by both the ease of disposal and the price received for certain goods (Stevenson and Forsythe, 1998).

The potential resale value of goods is not, therefore, the only determinant of what items are stolen, but it is reported by some offenders to be a central one. Ease of disposal is another key determinant of what offenders steal. At least one reason for this is the link between crime and the regular use of certain drugs. Research suggests that around 45 per cent of acquisitive crime is committed by crack or opiate (mainly heroin) users, who frequently self-report that they require rapid access to cash in order to buy drugs (Morgan, 2014). Indeed, the primary motivation to commit crime for most burglars interviewed by Hearnden and Magill (2004) was the need to fund regular drug use. Therefore, these other factors need to be considered when examining the role of the value of stolen goods.

Influence of the product life-cycle

One factor that can influence a product's accessibility, value and ease of disposal is its position in the 'product life-cycle'. This is claimed to be more relevant to consumer products, like electronic goods, than goods for which there is little innovation. Felson's (1997) theory about the product cycle can be summarised as follows.

- In the **'innovation stage'** of the product cycle, thefts are low as the product is too expensive and difficult to use for anyone but enthusiasts to own.
- Thefts increase rapidly during the **'growth' phase** as ownership increases in line with decreases in the product's price.
- By the time the product is at the **'mass market' stage**, thefts of the product are 'endemic', as there are still many people who are willing to buy stolen versions of the product – even if the cost of legal purchase is low.
- Finally, once the product reaches the **saturation stage**, nearly everybody that wanted one has one, and thefts therefore decline due to the drop in demand and price.

Wellsmith and Burrell (2005) tested this hypothesis using data on recorded domestic burglary from the West Midlands between 1997 and 2003. Some of their findings supported the product life-cycle hypothesis. For instance, they found that thefts of video cassette recorders (VCRs) fell over the period, which coincided with falling VCR prices and household ownership increasing from 82 to 89 per cent, indicative of the saturation stage. Thefts of mobile phones occurred in 2 per cent of burglaries in 1997 but this went up to 20 per cent in 2003, a pattern repeated in CSEW data examined later in this report. This happened at the same time that market penetration of mobile phones increased rapidly – from 58 to 70 per cent between 2000 and 2001. This could be interpreted as the shift from the 'growth' to 'mass market' stage.

However, thefts of televisions were not well explained by the product cycle. There was stable ownership at about 97 per cent over the period, prices increased as new flat screen models were introduced, but thefts fell. The authors (*ibid.*) concluded that the increase in the size of new flat screen models made them unwieldy to steal, and counteracted the increase in value.

Wellsmith and Burrell conclude that the product life-cycle partly explains theft trends for a number of mass-market consumer goods. But they point out that the speed with which some technological products are upgraded by manufacturers, for example, mobile phones, casts doubt over whether these products could ever reach the 'saturation stage' – i.e. there would always be a market for the latest model.

The West Midlands study has a number of limitations. It only covers burglary in one English region and focuses on a relatively short period of time (six years). This analysis seeks to enhance the breadth and scale of prior research by looking at nationally representative datasets on all forms of personal acquisitive crime across several decades.

2. How the total value of stolen goods has changed

This section looks at the value of all goods stolen in incidents of crime to get a sense of whether thieves are stealing more or less valuable goods than in the past, and whether this is related to levels of crime.

Victim-reported data on the total value of goods stolen per incident are available from the first Crime Survey[5] covering 1981. However, for the Crime Surveys before 1991 this value is reported in grouped categories. This makes it very difficult to estimate the true sample mean, as the mean is affected greatly by very high values (shown later), which are censored into a '£1,000 and above' category for the early years of the survey. For this reason, this analysis only looks at data from 1991 onwards.

Figure 1 – Total value of goods stolen – all personal and household acquisitive crimes with loss, including vehicle theft, 1991–2013/14
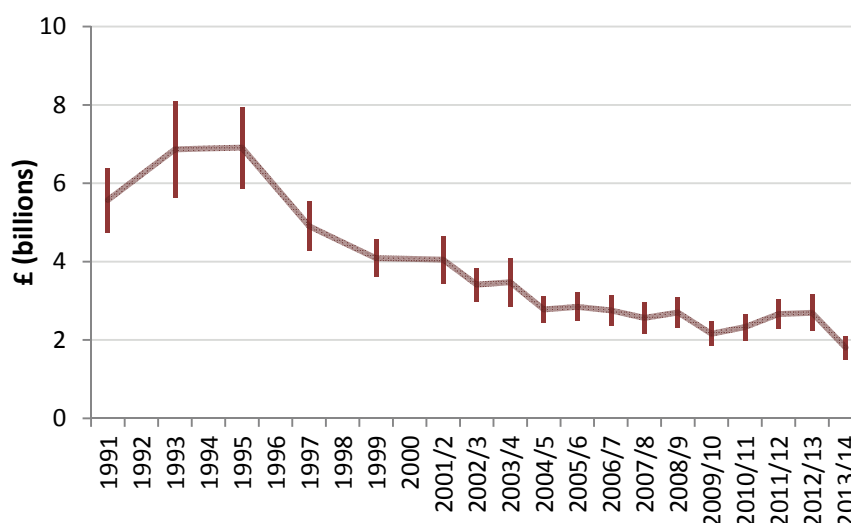
Source: Crime Survey for England and Wales (CSEW) datasets and Office for National Statistics (ONS), 2014

Notes: Monetary values are inflation-adjusted to 2012/13 using the Consumer Price Index CPI. 95% confidence intervals (CIs) are approximate as the data are not normally distributed, and the CIs assume that the numbers of incidents are known. Between 1991 and 2001/02, the CSEW (formerly called the British Crime Survey) was only in operation once every other year, which is the reason for the gaps in Figure 1 and elsewhere. Details of the processes to compute the 'total value of goods stolen' are outlined in technical annex C.

Figure 1 shows that the total value of goods stolen has fallen from £6.9bn in 1995 to £1.8bn in 2013/14 – a fall of 75 per cent. The majority of the decline occurs between 1995 and 1999, from

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[5]   The name of the Crime Survey for England and Wales was changed from the 'British Crime Survey' in 2012 to better reflect its geographical coverage.

that point on the fall is more gradual.

The series in Figure 1 is constructed by multiplying the total number of acquisitive crime incidents with loss by the mean value of goods stolen per incident. These individual series are shown in Figure 2.

Figure 2 – Trends in mean value of goods stolen in all incidents of personal and household acquisitive crime
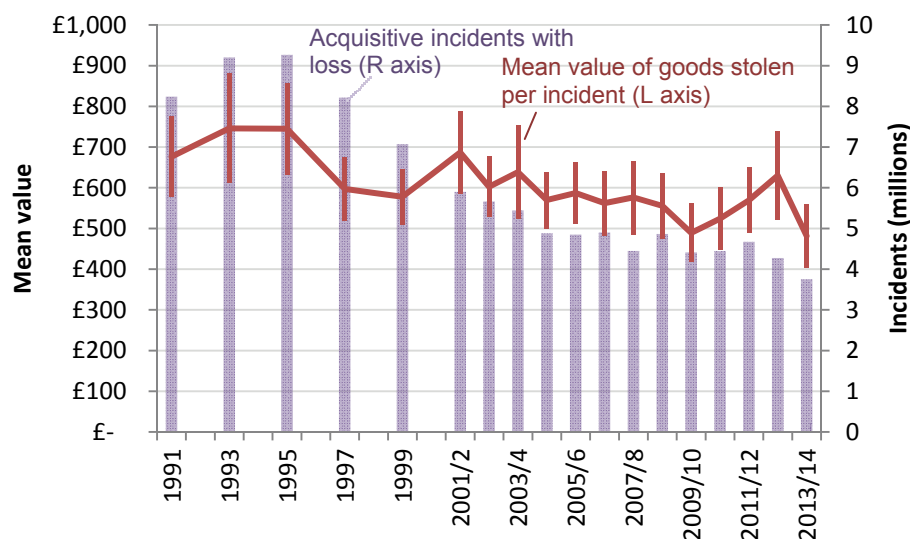
Notes: The mean value of goods stolen per incident is computed using a set of variables in the CSEW that give victims' estimations of the total value of items stolen per theft. More details on this are in technical annex C. Approximate 95% CIs shown for mean value, monetary values inflation-adjusted to 2012/13 using the CPI.

Figure 2 shows that both series have fallen, but that the numbers of incidents have fallen by a greater extent than the mean value per incident. The fall in the mean value is still statistically significant[6] (p<.01). It is down from £745 (± £113)[7] in 1995 to £481 (± £79) in 2013/14, a decrease of about 35 per cent. This means that the total loss to victims from acquisitive crime has fallen by more than the number of incidents. The fall in the incidents is 60 per cent while the total loss has fallen by 75 per cent.[8]

The next set of analyses investigates the distribution of losses. Generally the findings show that the total losses are heavily affected by a small number of high-value thefts. The data show that, in 2013/14:

- the bottom 25 per cent of incidents by value (approximately £25 and under) contributed just 0.6 per cent to the total value of goods stolen;

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[6]　An independent-samples t-test (assuming unequal variance) conducted to compare the difference between the mean values of thefts in 1995 and 2013/14 computes a t-statistic significant at p<.001. As a measure of robustness, data for 2010/11 to 2013/14 are pooled together and compared with the pool of 1991, 1993, 1995 and 1997 data. A t-test of the difference between the 2010s and 1990s pools is also statistically significant at p<.001. See technical annex D for more details and corresponding tables.

[7]　95 per cent CIs shown are approximate as the data in all years are right-skewed. The CIs include the design effect of 1.2 as outlined in the CSEW technical guide.

[8]　The published statistics show a 62 per cent fall in overall theft from 1995 to 2013/14. The 60 per cent figure refers to just incidents involving loss to victim.

- the bottom 50 per cent of incidents (those under about £100) corresponded to 3 per cent (£56m) of the total value of goods stolen;
- the top 2 per cent of incidents (those valued at £4,400 and above) corresponded to 46 per cent of total value (about £830m); and
- the top 1 per cent of incidents (those above £7,300 – some 40,000 incidents) equal £610m (about 34% of total value).

Figure 3 shows the skewed nature of the loss distribution.

Figure 3 - Lorenz curve showing distribution of incidents, by value of stolen goods taken in 2013/14
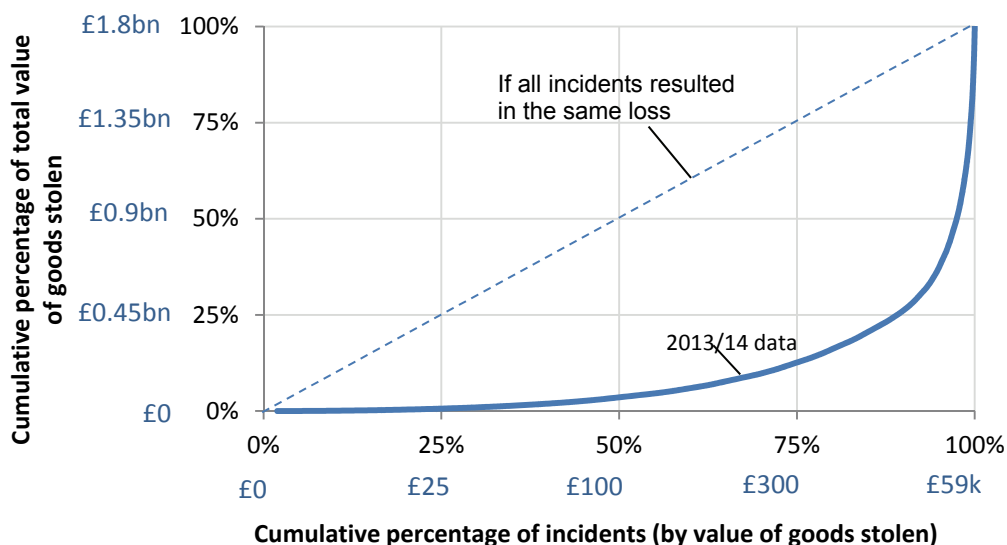
Source: CSEW, 2013/14

Table 1 compares the distribution of incidents between 1995 and 2013/14. It shows that the estimated number of high-loss incidents of theft has decreased to a greater degree than the number of low-value incidents. This essentially explains why there has been an overall decline in the mean value of goods stolen. Incidents resulting in a loss of under £100 have fallen by around half between 1995 and 2013/14, but incidents resulting in losses of over £1,000 have fallen by around 80 per cent.

Table 1 – Incidents of acquisitive crime with loss (thousands), broken down by value of goods stolen, 1995 and 2013/14

Incidents (000s)	1995	2013/14	Change
Under £100	4,340	2,058	-53%
£100–£999	3,617	1,438	-60%
£1,000–£9,999	1,215	233	-81%
£10,000 and over	111	30	-73%
All incidents	**9,274**	**3,755**	-60%

Source: CSEW, 1996, 2013/14

Notes: Monetary values inflation-adjusted to 2012/13 using the CPI.

Table 2 elaborates this finding a little more by showing the proportional changes in both the distribution of incidents, and the contribution these different incidents make to the total sum of goods stolen.

Table 2 – Incidents of acquisitive crime with loss (percentages) and estimated total value of items stolen (percentages), broken down by the value of goods stolen, 1995 and 2013/14

Proportion of all incidents, by value of goods stolen (%)	1995	2013/14
Under £1,000	86	93
£1,000–£9,999	13	6.2
£10,000 and over	1.2	0.8
All incidents	*100*	*100*
All incidents	*9.3m*	*3.8m*
Estimated total value (%)	**1995**	**2013/14**
Under £1,000	19	32
£1,000–£9,999	54	39
£10,000 and over	27	29
All incidents	*100*	*100*
All incidents	*£6.9bn*	*£1.8bn*
Mean value of incidents	**£744**	**£481**

Notes: Columns may not sum to 100 per cent due to rounding. Monetary values inflation-adjusted to 2012/13 using the CPI.

The key points from Table 2 show the following.

- The proportion of incidents where the value of goods stolen was less than £1,000 has increased. By contrast, the proportion of incidents where losses of between £1,000 and £9,999 occurred has decreased, as has the proportion of the total value of goods contributed by this category.
- While the proportion of incidents over £10,000 is smaller in 2013/14 than in 1995 (1.2% of incidents to 0.8% of incidents), in both years these incidents accounted for just over one-quarter of the total value of stolen goods.

The change in the value of total stolen goods over time can also be broken down by crime type. Table 3 shows that the mean loss varies by crime type. Certain offence types, such as vehicle theft and burglary, generally result in much larger losses than other offence types.

Table 3 – Estimated mean value of loss from incidents, by offence type, 1995 and 2013/14

Estimated mean values	1995	2013/14
Theft of motor vehicle	£5,610	£4,370
Burglary in dwelling	£1,970	£2,420
Theft of bicycle	£390	£330
Other theft of personal belongings	£530	£290
Theft from the person	£90	£250
Theft from motor vehicle	£310	£230

Source: CSEW, 1996, 2013/14

Notes: Inflation-adjusted to 2012/13 and rounded to nearest £10.Not all differences in this table are statistically significant. Technical annex D contains a table showing whether the pooled mean value for each crime type has changed significantly between the 1990s and 2010s.

This, along with the fact that different offences have fallen by different amounts, means that some offences have contributed more than others to the total fall in value of goods stolen. Figure 4 shows the change between 1995 and 2013/14 in the make-up of acquisitive crime with loss.

Figure 4 – Acquisitive offences with loss, broken down by offence type, 1995 and 2013/14
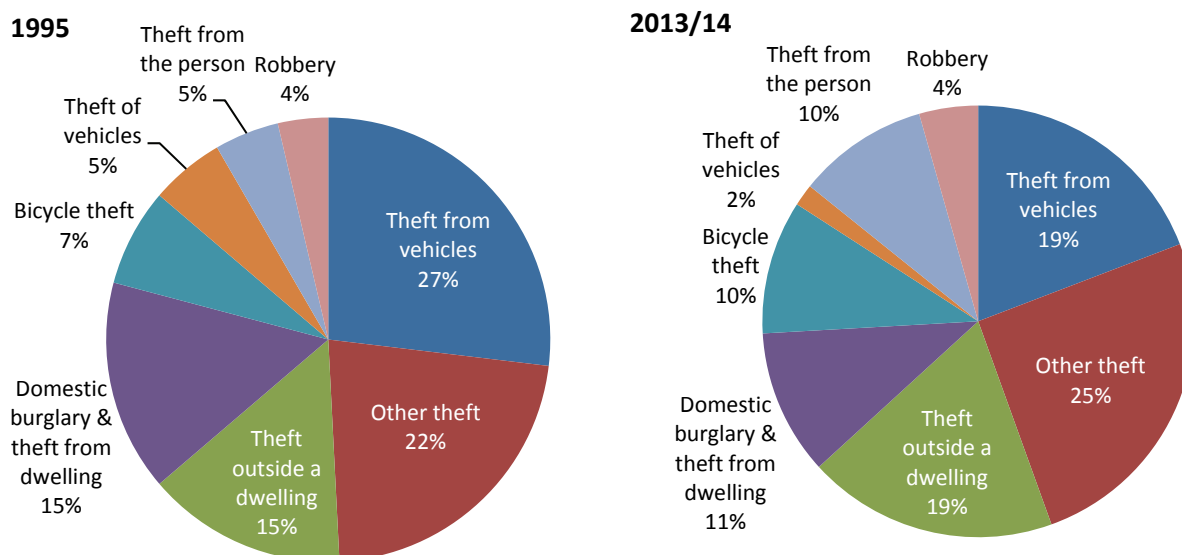
Source: ONS, *Crime in England and Wales, year ending March 2013/14*

Incidents of burglary and vehicle crime have fallen by more than the other offence types (Figure 4), and as these offences also have high mean values (Table 3), their effect on the overall fall in the value of stolen goods is considerable. This is shown in Table 4 which breaks down the total fall in the value of stolen goods by year and by crime type.

Table 4 – Acquisitive offences with loss (£millions), broken down by offence type and year

Year	Rob bery	TftP with loss	Other theft	Burglary	Other house hold theft	Theft of vehicles	Theft from vehicles	Bike theft	Total
1991	£29	£34	£399	£1,656	£211	£2,421	£655	£149	£5,555
1993	£85	£48	£652	£2,580	£202	£2,772	£893	£204	£7,436
1995	£114	£38	£1,093	£1,846	£260	£2,806	£773	£255	£7,186
1997	£277	£67	£482	£1,480	£245	£1,760	£553	£168	£5,032
1999	£157	£60	£369	£1,142	£189	£1,183	£522	£134	£3,757
2001/02	£383	£77	£408	£1,128	£154	£1,345	£624	£118	£4,236
2002/03	£90	£80	£443	£1,338	£141	£730	£448	£105	£3,376
2003/04	£99	£117	£816	£1,028	£142	£712	£486	£106	£3,505
2004/05	£232	£58	£364	£858	£242	£550	£423	£129	£2,855
2005/06	£179	£75	£395	£910	£165	£748	£300	£129	£2,900
2006/07	£97	£72	£488	£828	£174	£581	£400	£114	£2,753
2007/08	£157	£81	£198	£1,051	£165	£645	£237	£110	£2,645
2008/09	£191	£102	£343	£878	£318	£549	£226	£128	£2,735
2009/10	£199	£51	£246	£841	£233	£339	£184	£131	£2,223
2010/11	£127	£62	£249	£981	£174	£346	£207	£147	£2,292
2011/12	£105	£73	£394	£1,130	£226	£422	£192	£134	£2,676
2012/13	£218	£87	£408	£1,097	£278	£400	£174	£138	£2,800
2013/14	£66	£91	£271	£622	£192	£271	£163	£124	£1,802
Overall change 1995 to 2013/14	-£48	£53	-£822	-£1,224	-£67	-£2,535	-£610	-£131	-£5,385
Percentage contribution to overall 1995-2013/14 change.	1%	-1%	15%	23%	1%	47%	11%	2%	100%

Notes: Monetary values inflation-adjusted to 2012/13 using the CPI. The total values of goods stolen from all offences in this table are slightly different to those shown elsewhere in this report. This slight discrepancy is unavoidable due to different estimation methods. Refer to technical annex C for more information.

Theft of vehicles, even though it only made up 5 per cent of acquisitive crime with loss in 1995, was responsible for almost half (47%) of the fall in the total value of goods stolen between 1995 and 2013/14 (Table 4). Burglary and other theft are the only other offence types that contribute more than 15 per cent to the decline. The theft of vehicle figures shown in Table 4 will include some incidents in which the vehicle was ultimately recovered (for example, if the vehicle was used for joyriding). In these cases the total loss is an upper bound on the actual loss.

The main reason that theft of vehicles makes a far bigger contribution to the fall in the total value of stolen goods is that its mean value is i) larger on average, and ii) has declined slightly between 1995 and 2013/14 whereas the mean value of items stolen in a burglary is actually

higher in 2013/14 than in 1995[9].

This is interesting in light of the crime drop. One theory that has been proposed is that the fall in acquisitive crime is connected to the decline in the value of typical items stolen[10]. At first glance the data do not bear this out. Burglary has fallen by almost as much as vehicle theft yet the average value of the goods stolen in burglaries has actually risen, according to the CSEW data. However, this is explored more fully in the next section.

Relationship between rate of crime and overall value of stolen goods

Figure 2 shows that the mean value of goods stolen in incidents of acquisitive crime has fallen between 1995 and 2013/14. It has been suggested that this could be a cause of the decline in incidents. That is, as the opportunity to steal more valuable items fell, offenders turned away from crime, leading to a drop in incidents. This section investigates that hypothesis with the available data.

As the majority of thefts result in losses of under £100, it is reasonable to assume that changes in these kinds of values are perhaps more likely to affect the average offender than the extremely high and rare values (for example, £10,000 and over). As such, the median and 80th percentile values are given below in addition to the mean to attempt to illustrate middle and relatively high values.

Figure 5 – Mean, median and 80th percentile of value of goods stolen per incident in all personal and household acquisitive crime
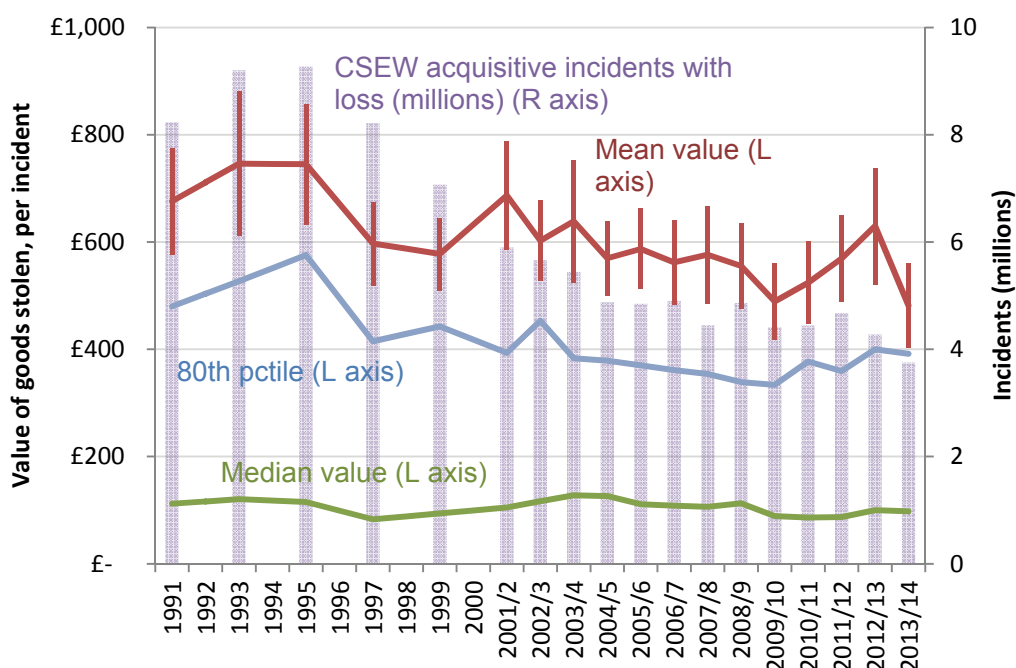
Source: CSEW survey data

Notes: Monetary values inflation adjusted to 2012/13 using the CPI. 95% CIs are approximate due to the value data being right-skewed.

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[9] It is important to note that while it is true that the point estimate for the mean value of vehicle thefts is lower in 2013/14 than in 1995, and that this will affect the overall fall in total value of stolen goods, it is not a statistically significant fall in itself. However, technical annex D contains a table that tests whether the pooled mean value for each crime type has changed significantly between the 1990s and 2010s. This shows that the rise in the mean value of burglary is significant, but the fall in the mean value of vehicle thefts is only significant at p<.10.

[10] http://news.bbc.co.uk/1/hi/uk/8507528.stm

The mean and 80th percentile values of goods stolen in thefts shown in Figure 5 are lower in the 2010s than at the crime peak of 1995. One interpretation of this could be that the opportunity to steal more valuable goods drove the increase in acquisitive offending, and when that opportunity receded, acquisitive crimes fell.

However, it seems unlikely that the modest decreases[11] in the median value (£115 to £95 between 1995 and 2013/14), which most closely shows the 'typical' haul a thief could expect, can explain much of the large decrease in acquisitive crimes (9.3m to 3.8m). Furthermore, the rest of the trend in the median does not seem to correspond with the trend in crime – for example, the increase from £90 to £128 between 1997 and 2003/04 while crime reduced substantially.

Yet, it may be that thieves are more greatly motivated by the upper range of values (for example, around the 80th percentile) – the potential haul on a good day. If so, the rise and subsequent fall of the 80th percentile value around the crime peak is a potential explanation. Equally, apart from the large increase between 2011/12 and 2012/13, the trend for the 80th percentile broadly mirrors the downwards direction of crime.

Figure 6 – Average value of items taken per incident, burglary and theft from the person
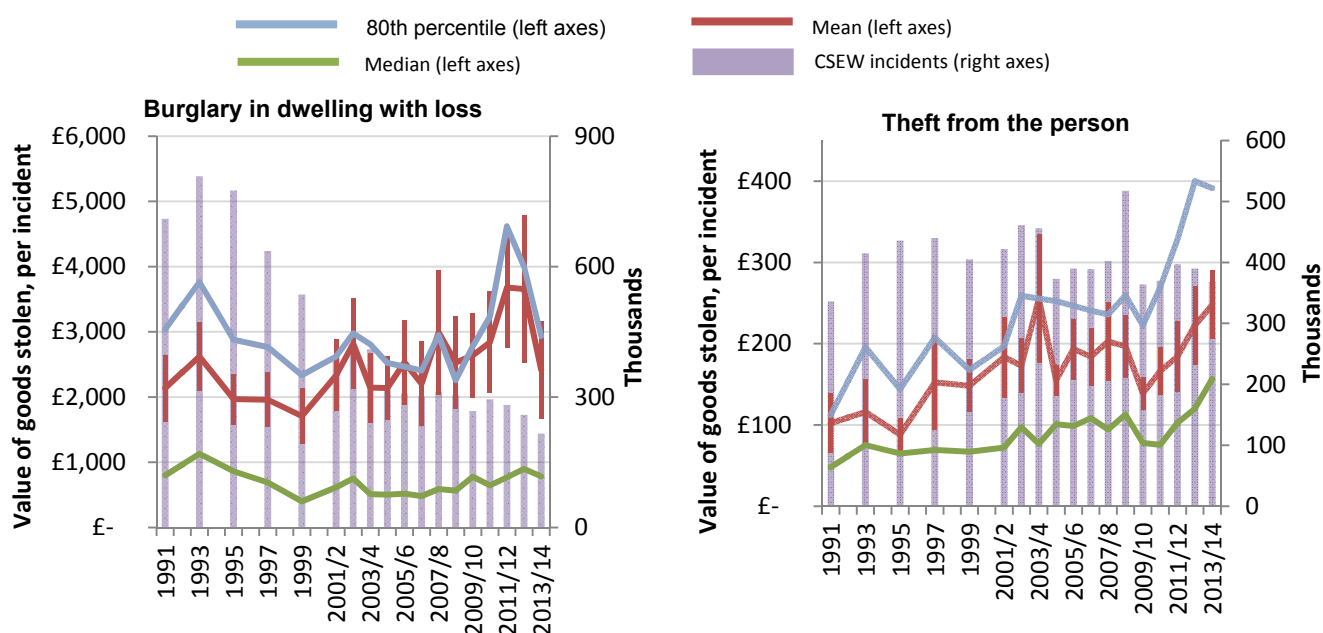
Source: CSEW Surveys

Notes: Monetary values, inflation-adjusted to 2012/13 using the CPI.

However, there does not appear to be a relationship between the incidence of burglaries and the value of goods stolen. While the mean, median and 80th percentile appear to be positively correlated with incidence up to the millennium (both rising and then falling after the crime peak), all three values increased notably between the early 2000s and 2012/13 while incidents of burglary continued to fall.

A comparable pattern has been seen in the United States (Walters et al. 2013). Data from the National Crime Victimization Survey (NCVS) show that between 2000 and 2011 after adjusting

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[11] Statistically significant to p<.05 using median test in SPSS.

for inflation the median loss from a burglary in the US increased by 48 per cent, and the mean loss increased by 32 per cent (annex E). Similar to the UK, this occurred over a period where the rate of burglaries decreased substantially – down 56 per cent.

Neither is there a clear relationship between the level of thefts from the person and value of goods stolen. Despite large increases in the average haul for thieves – since 1995 the median increased from £65 to £160, and the 80th percentile increased from £145 to £390 (Figure 6) – the level of thefts from the person has broadly stayed the same over the past two decades.

It could be argued that, when taking into consideration the general reductions to crime over this period, the increase in value of thefts from the person is simply an upward pressure on what would otherwise be a downward trend.

Reviewing four other offences – theft from vehicles, theft of bicycles, theft from outside a dwelling, and other theft of personal belongings – there was similarly no strong case for a relationship between changes in the average value of goods stolen and rates of thefts (Figure 7).

- **Theft from vehicles** – Numbers of incidents and the average value of incidents have decreased notably since 1995. Yet the reductions in value have only occurred over the past decade or so, whereas the number of incidents had been decreasing sharply for at least another decade before this point.
- **Theft of bicycles –** Other than the general point that the median value and frequency of bicycle thefts are slightly lower now than two decades ago, there is little correspondence between the two in terms of actual trends.
- **Other theft of personal belongings –** Overall there appears to be a generally negative correlation between the median, 80th percentile value and incidents of 'other theft' – both value measures have increased since the 1990s, whereas the number of incidents have fallen dramatically. This is an important counter example to the trend shown for theft from the person, as it would be expected that the types of goods stolen in these two offence types are similar.
- **Theft from outside a dwelling –** While the mean has fluctuated, almost certainly due to changes in extremely high-valued thefts, the median and 80th percentile have stayed more or less constant over the past two decades while the incidence has shown both long-term and substantial upwards **and** downwards trends.

Figure 7– Incidence and average value of items taken per incident, by offence type
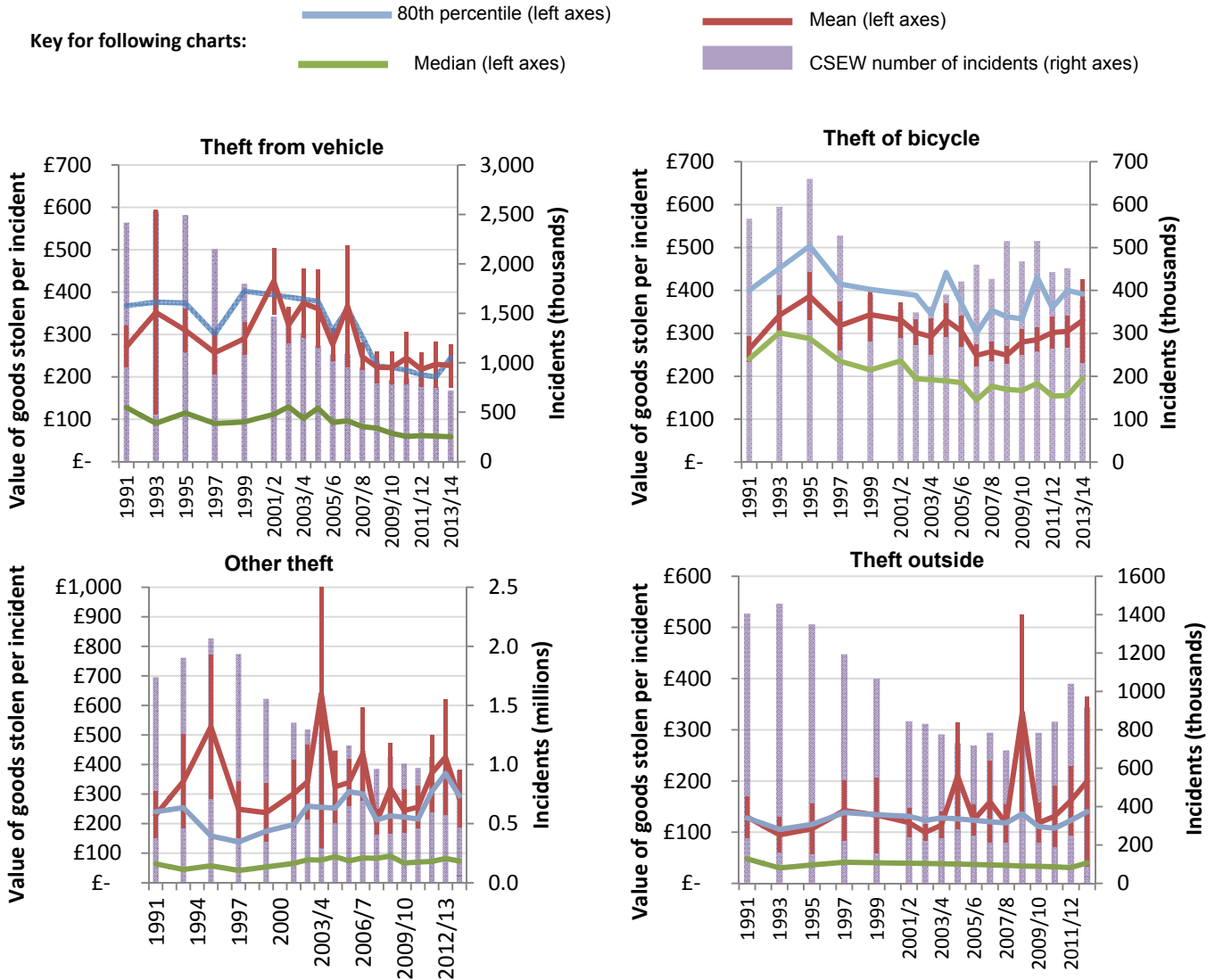
- 80th percentile (left axes)
- Median (left axes)
- Mean (left axes)
- CSEW number of incidents (right axes)

Source: CSEW surveys

Notes: Monetary values inflation-adjusted to 2012/13 using the CPI. 95% CIs around the means are approximate as the data are not normally distributed.

Despite the lack of a general relationship between trends in value and trends in incidents, either at the overall or individual crime-type level, changes in value may induce substitution by offenders over time. That is, offenders will often try to maximise their gain by selecting the most valuable set of items over time. It is possible that if the typical value of the overall pool of steal-able goods decreases and extra effort is therefore required to achieve the same level of criminal gain (for example, by adapting offending behaviour or gaining new knowledge about the value of new types of items) this *may* cause some offenders to stop committing theft. The net result could be a fall in crime that *is* affected by changes in the value of steal-able goods, but a flat trend in the median value of thefts. There is no available evidence to suggest that this process actually occurred, but it is important to acknowledge the possibility.

There are a number of conclusions from this section. Firstly, the crime mix is important in determining the total value of losses from acquisitive offences. Thefts of vehicles, in particular, have a large impact due to these being the highest cost offence type. So the large reduction in the number of these offences has had a marked effect on the fall in the total value of goods stolen. This has not been offset by the rise in the total value of stolen goods in theft from the person, because this is generally a lower value offence.

However, overall there was no strong evidence that changes to the value of items stolen impact upon the overall trend in acquisitive crime incidents or on trends in individual crime-types. Theft from the person is a potential exception to this, in that it is the only offence type to be increasing in value and has broadly stable incidence against a backdrop of generally reducing crime.

Comparing Crime Survey for England and Wales crime losses with losses from other crime types

One benefit of creating an estimate of the value of loss in acquisitive crime is that it enables comparison against long-term trends in some other crime types that are measured in terms of the value of losses, and not necessarily the number of incidents (for example, fraud).

This is important, because it has been suggested that the downward trend in acquisitive crime may have been offset by a rise in plastic card fraud.[12] Figure 8 compares the estimated value of plastic card loss against the estimated loss due to acquisitive crime.

Figure 8 – Estimated value of losses through plastic card fraud and value of goods stolen in acquisitive crimes
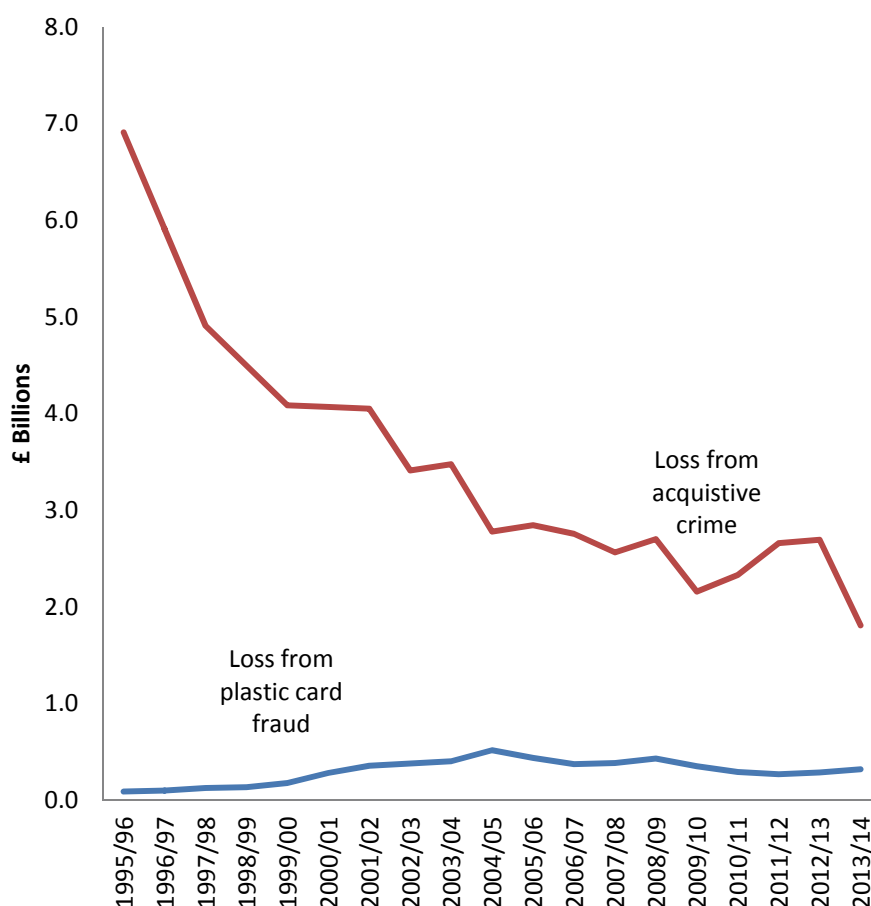
Sources: CSEW datasets, Financial Fraud Action UK[13]

Notes: Inflation-adjusted to 2012/13 using the CPI. FFA plastic card fraud relates to the corresponding calendar year (2013 is shown as 2013/14 on the above chart).

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[12]   See, for example: http://www.crimeandjustice.org.uk/resources/curious-case-fall-crime
[13]   Financial Fraud Action UK data can be found at: http://www.financialfraudaction.org.uk/Fraud-the-Facts-2014.asp. The data shown cover only losses *in* the UK on UK registered cards.

From 1995/96 until 2004/05, the trend in losses from plastic card fraud follows an inverse pattern to the total loss from acquisitive crime, which does suggest the possibility of some substitution. However, the levels of loss across the two series are vastly different. The increase in plastic card fraud from 1995 to 2001/02 (£290m) does not come close to offsetting the decline in loss from acquisitive crime over the same period (£5bn). That said, because the losses from CSEW acquisitive crimes have reduced by such a large amount, the losses from plastic card fraud almost certainly do make up a larger proportion of the total loss combined than they did in 1995.

Plastic card fraud is only one type of fraud and it is possible that a more comprehensive measure of fraud might increase the degree of offsetting. Data on fraud is fast improving, but there are few fraud types that have been measured consistently back to the 1990s, which makes construction of a more comprehensive time series on fraud problematic. However, the largest single fraud-type contributing to the cost of fraud, according to the Annual Fraud Indicator, is tax fraud and HM Revenue and Customs (HMRC) have published time-series data on some of the largest elements of this: Missing Trader Intra-Community (MTIC) or carousel fraud and excise duty fraud (involving the smuggling of cigarettes and alcohol). Available data for these are shown in Figure 9 below.

Figure 9 - Time-series data on tax-related fraud and plastic card fraud
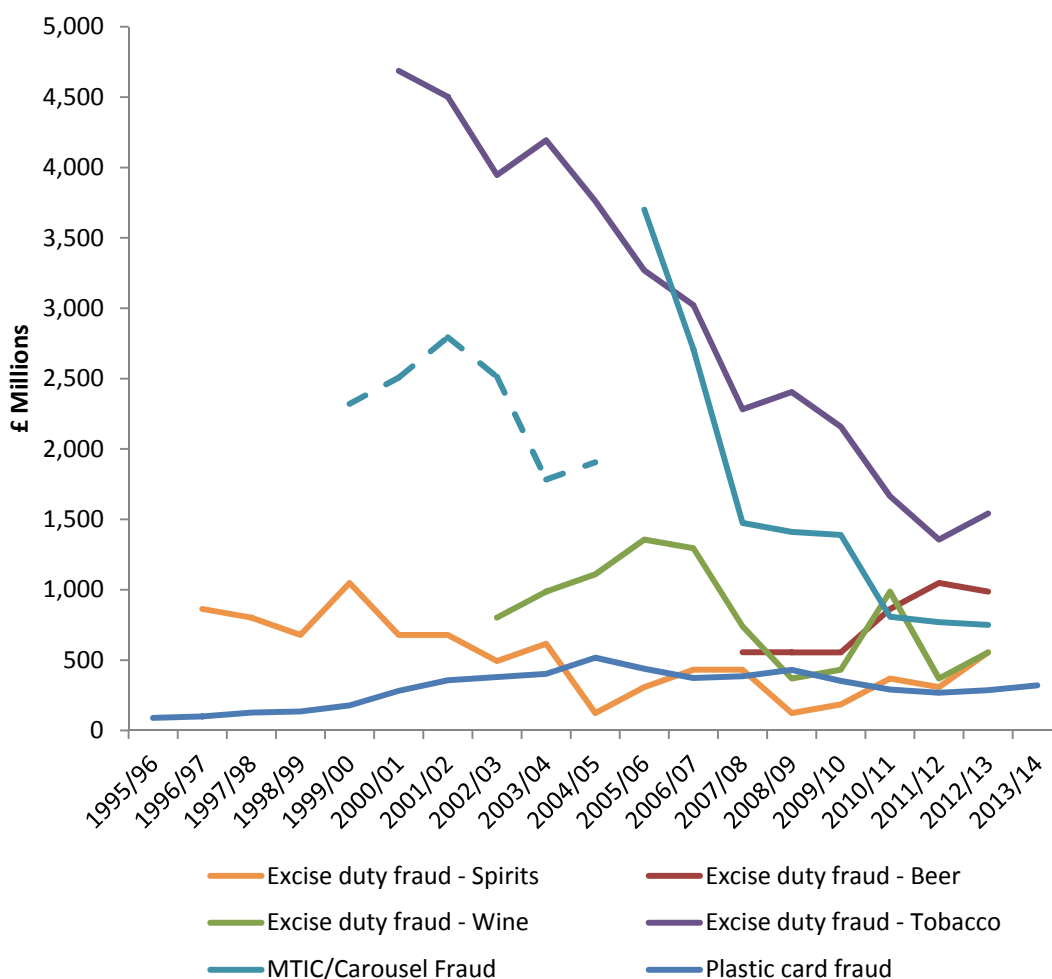
Source: HMRC and Financial Fraud Action UK

Notes: All series are inflation-adjusted to 2012/13 using the CPI. The methodology for calculating MTIC/carousel fraud changed in 2005/06. This had the effect of increasing the value of fraud recorded, hence we show the trend in two sections with the dotted line indicating the older methodology. With the exception of the plastic card fraud series, all figures shown are mid-points between the published upper- and lower-bound estimates.

These data series do not cover total fraud losses, so any conclusions in relation to fraud overall must remain tentative. But based on these data, it is clear that while losses from tax-related fraud are certainly of a comparable magnitude to losses from acquisitive crime, they also seem to be on generally declining trends since the 1990s and early 2000s. That is, the total loss from tax-related fraud seems to have fallen in line with other types of crime, rather than rising as a result of substitution out of theft

Crimes against businesses

Given its personal and household focus, the CSEW does not cover crimes against businesses. Additional data sources are therefore required to shed light on whether trends in acquisitive crimes against businesses have mirrored, or compensated for, the fall in losses from personal and household crime. This analysis uses data from the Commercial Victimisation Survey (CVS) and Police Recorded Crime (PRC) figures.

Shoplifting

The CVS is a nationally representative sample survey of business properties across several industries, and was run in 1994, 2002 and 2012-14. Unlike PRC, the CVS captures both crimes that were reported to the police and those that were not.

However, the methodology and coverage of the CVS changed significantly between 1994 and 2002 (Shury et al. 2005), and to a lesser degree between 2002 and 2012 (Home Office 2013a). As stated in the publication of the 2002 CVS findings, the way of estimating costs of crimes against businesses differ too much for the 1994 survey to be comparable with later surveys.

Nevertheless, using the last four surveys it is possible to estimate a total value of items stolen from shoplifting (defined in the survey as theft by customers from the wholesale and retail sector). Table 5 shows that the total value of goods stolen from shoplifting has fallen substantially, even since 2012.

Table 5 – CVS estimates of thefts by customers in the wholesale and retail sector

	2002	2012	2013	2014
Mean value (inflation-adjusted to 2012)	£285	£158	£173	£121
Incidents (millions)	11.5	4.1	3.2	2.1
Total value of items stolen/unpaid (millions)	£3,274	£646	£561	£256

Source: Shury et al. (2005); Home Office (2015a; 2015b).

Notes: Total value of items stolen is calculated by multiplying the mean value by the number of incidents. Due to industry classification changes, the 2002 CVS includes some kinds of retail establishments that the 2012-14 surveys do not, and vice versa. As such, the figures for 2002 above are not strictly comparable with the latter surveys. However, using comparable subsamples it was estimated in a separate piece of analysis that there were 12.1m shoplifting incidents in 2002 and 3.8m in 2012 (Home Office 2013b), which suggests that the fall between 2002 and 2012 as shown above is, if anything, understated.

This fall is even clearer when compared to CSEW figures. For instance, the 2002 CVS estimate for the value of goods stolen through shoplifting (£3.3bn) was nearly the same as the total value of goods stolen in all personal and household acquisitive crime in 2002/03 (£3.4bn). Yet the

2014 estimate for losses from shoplifting (£256m) was much smaller, less than one-sixth the size of the 2013/14 estimate for losses from personal and household acquisitive crime (£1.8bn).

In sum, these estimates suggest that losses from shoplifting have fallen significantly. This in turn suggests that changes to the costs of shoplifting have complimented, rather than offset, falls in the losses from personal and household acquisitive crime.

An important caveat to these findings is that police recorded incidents of shoplifting were 16 per cent higher in 2013/14 than in 1995, which contrasts with the CVS estimates. However, there is no data in PRC that allows the calculation of the costs of shoplifting. Also, it will only capture incidents reported to and recorded by the police, which represent a fraction of the estimated CVS incidents.

Other crimes

CVS cost estimates for offences other than shoplifting are not published. However, using the published CVS incidence estimates for these other offence types, supplemented by PRC figures, it is clear that the costs of other acquisitive crimes against businesses have also likely fallen.

For instance, CVS estimates of theft by employees against the wholesale and retail sector fell by about 70 per cent between 2002 and 2012 (Home Office 2013b), and by roughly 70 per cent between 2012 and 2014 (Home Office 2015b). Police recorded incidents of employee theft also fell by 41 per cent between 2002/03 and 2013/14[14].

A similar pattern can be seen for burglaries against businesses. CVS estimates of burglaries with entry in the wholesale and retail sector fell by around 70 per cent between 2002 and 2012 (Home Office 2013b) and by another 70 per cent between 2012 and 2014 (Home Office 2015b). Police recorded incidents of burglary in a building other than a dwelling[15], including attempts, fell by nearly 50 per cent from 2002/03 to 2013/14[16].

Unless the average cost of these incidents increased by very large amounts, which seems unlikely, the total cost of these offence types against businesses will have reduced over the past decade or so. This, again, suggests that trends in the costs of crimes against businesses have mirrored and not contradicted trends seen in personal and household crime.

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[14],[16] Calculated using Home Office historical crime data, available at:
https://www.gov.uk/government/statistics/historical-crime-data.
[15] Many, but not all, of these incidents will be against business properties.

3. What items are stolen most frequently

This section outlines the most commonly stolen items, how these have changed over time, and what role value has played in influencing these changes.

Table 6 – Most stolen items in 2013/14 from household and personal acquisitive incidents with loss[17]

Item	% of incidents	Confidence Intervals (CIs) ±
Cash	16.7	1.5
Vehicle parts/accessories	14.6	1.4
Mobile phone	13.1	1.3
Bicycle	11.9	1.3
Garden furniture/equipment	9.6	1.2
Plastic card	8.2	1.1
Purse/wallet	7.7	1.1
Clothes	6.9	1.0
Other	6.5	1.0
Tools	4.8	0.8
Computer equipment	3.8	0.8
Jewellery/watches	3.8	0.8
Bag/briefcase	3.1	0.7
Documents	3.1	0.7
Groceries/alcohol/cigarettes	2.5	0.6
Various household items/gadgets	2.2	0.6
Portable audio or video device	1.8	0.5
House keys	1.8	0.5
Car/van	1.6	0.5
Scrap metal	1.6	0.5

Source: Crime Survey for England and Wales (CSEW) 2013/14

Notes: Items that would not likely be resold are bold highlighted.

As can be seen in Table 6, some items are stolen at much higher rates than others. Value, alongside other CRAVED factors, explains some of these patterns. For

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[17]   Table C in technical annex C shows the top six items stolen for all survey years between 1981 and 2013/14.

instance, the reasons that mobile phones are stolen more frequently than garden furniture are probably that the former are more concealable, easier to pass on, and generally more valuable.

However, the value of goods alone does not always explain why some things are stolen more often than others. For example, jewellery and watches are much more valuable on average than clothes, and would presumably be easier to conceal. Yet the fact that clothes are often left unattended in a way that jewellery and watches are not probably explains why the former is stolen twice as often as the latter (Table 6). Similarly, one might imagine that the sheer accessibility of garden furniture is the primary reason why it is stolen more than twice as often as computer equipment.

But as the next section shows, value *is* an important factor in explaining some of the **trends** in the most stolen goods.

As one of the aims of this study is to examine the potential resale value of goods and how this may affect thefts, here the focus is solely on marketable goods – i.e. those that would be **resold.** Items that would likely not be resold, such as cash and wallets/purses, have not been included.[18] Items covered by the 'other' category are also excluded as we do not know what these are. Figures 10 and 11 show eight of the nine marketable items that featured as a 'top six' stolen item in at least one CSEW survey (1981 to 2013/14)[19]. Figure 10 shows volumes of incidents and Figure 11 shows proportions of incidents where particular goods were taken.

In some respects there has been considerable continuity among the most stolen goods – the fact that there have only been nine different items in the top six most stolen goods illustrates this point. Similarly, motor vehicle parts and accessories have been the most commonly stolen type of market good for every year that the category has been included in the survey. But in terms of both the volumes of goods stolen (Figure 10) and the proportions of incidents (Figure 11) there are some clear trends.

Clothing was one of the most commonly stolen goods in the 1981 survey and the 1990s, but has declined relatively consistently in thefts across the last three decades, although there has been a slight, statistically significant rise since 2010. The proportion of personal and household offences involving the theft of tools and hi-fis has also declined significantly over the past decade, and the latter has decreased to negligible levels.

By contrast, mobile phones and bicycles were stolen in a significantly higher proportion of thefts in 2013/14 than in 1999, although the trend over the last few years for both offences has been broadly flat.

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[18] An assumption made is that wallets and purses are generally not stolen for resale, but are simply 'collateral damage' in thefts, i.e. they are stolen for their contents and later discarded. Of course, some designer purses may well be stolen for resale, but as purses cannot be separated from wallets in a number of crime survey datasets, the assumption that the vast majority of this category will not be sold for resale seems reasonable. Similarly, as this section looks at the changing characteristics and value of stolen goods, cash has been excluded as this item has not changed over the time period covered.

[19] The reason for only showing these most stolen items is that there is more statistical uncertainty about the less frequently stolen items, which makes it difficult to confidently assess trends. Cars/vans are excluded from the charts as these only featured in the 'top six'' in 1981.

Figure 10 – Most stolen goods across the past three decades, volumes
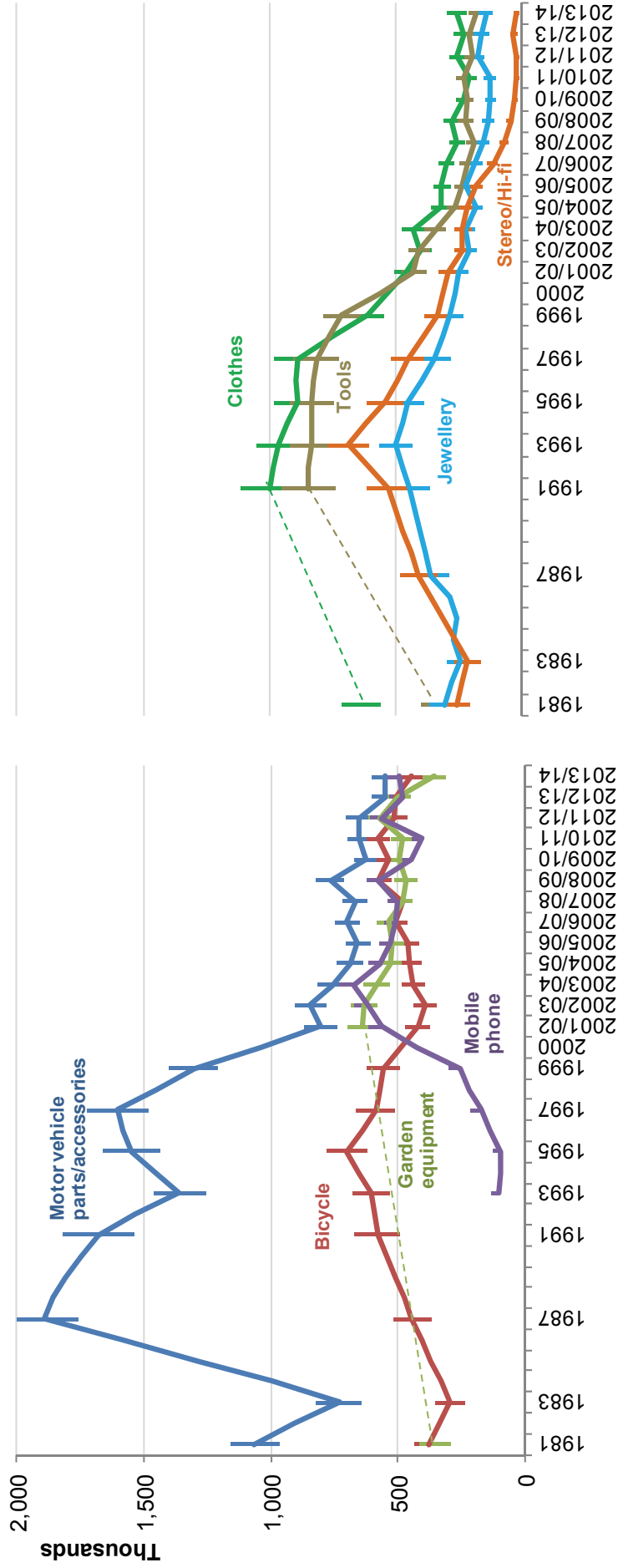
Notes: CIs assume that incidents of crime are a known quantity.

Crime and the value of stolen goods

Figure 11– Most stolen goods across the past three decades, percentages of incidents

Notes: Same as Figure 10

Crime and the value of stolen goods
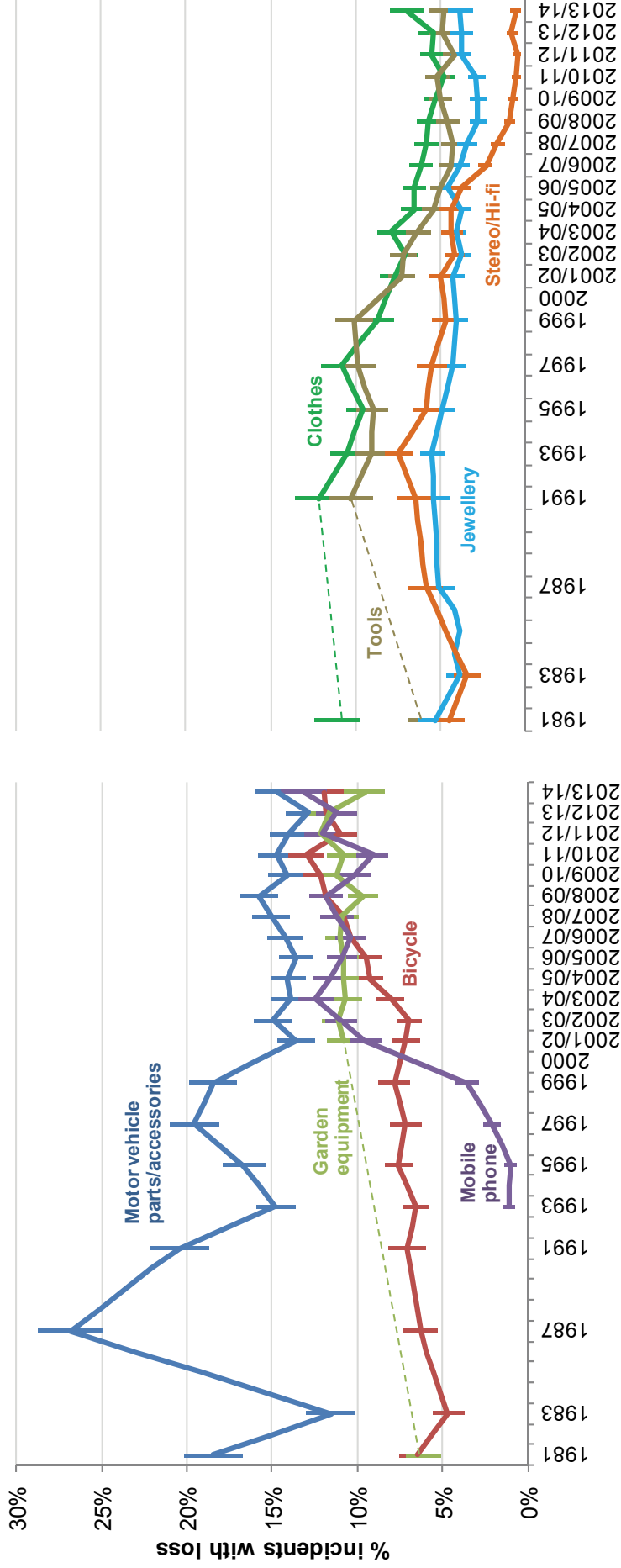
Around five per cent of thefts across the period involved the taking of jewellery (though this dipped slightly in the late 2000s), and garden equipment has also stayed relatively constant, being taken in around ten per cent of thefts.

The next section explores some of these individual trends and compares them to changes in value. Assessing change in value over time for individual categories of items is not easy for a number of reasons that are explored in Technical annex A. However, a reasonable guide can be obtained by looking at those categories that make up the Consumer Price Index (CPI) which most closely match the categories from the CSEW. The available trends from 1996 to 2014 for the CPI categories which correspond to most of the top 12 most stolen items are shown in Figure 12.

Figure 12 – Charts showing Consumer Price Index trends for the most stolen goods[20], after adjusting for inflation (Indexed 1996=1).
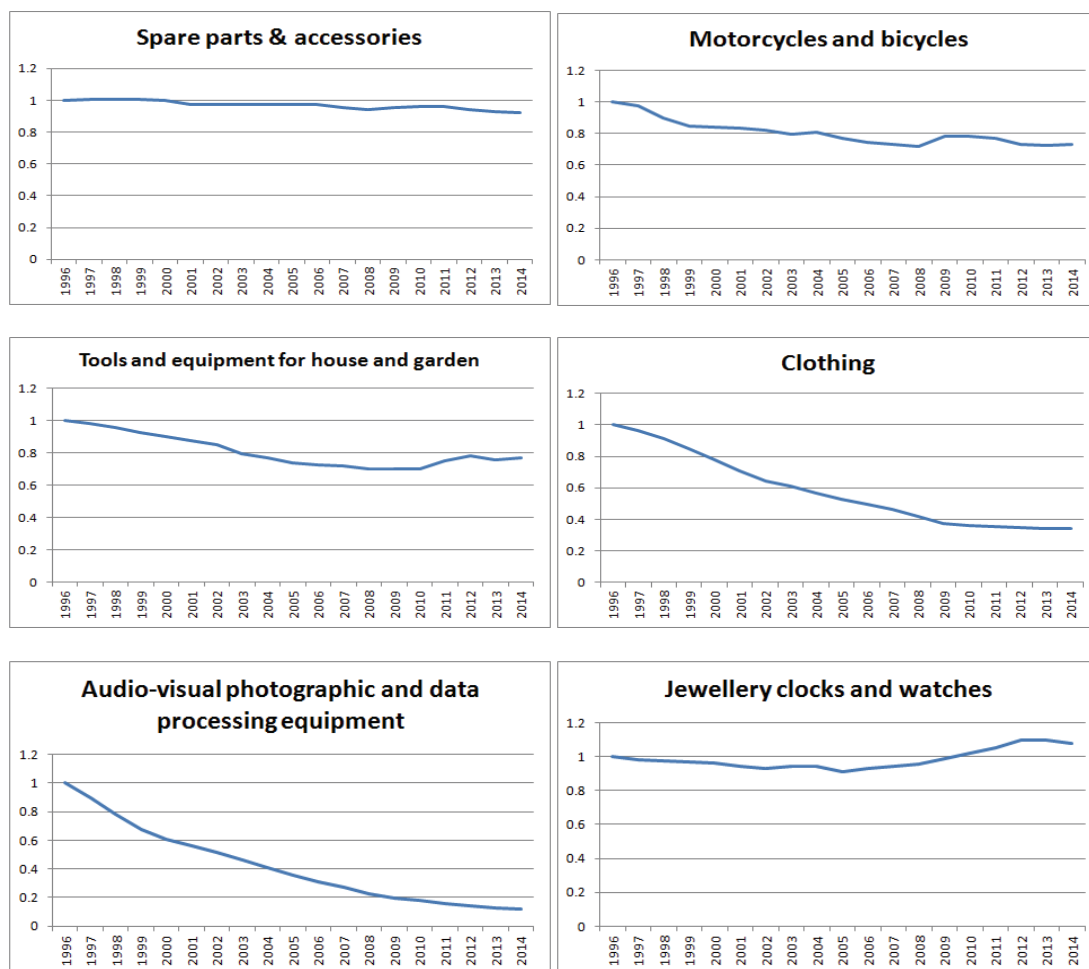
Source: ONS

Notes: Individual category trends above show changes relative to overall CPI.

The CPI categories shown in Figure 12 do not map perfectly onto the CSEW

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[20]   The trends show the individual price indices for those items relative to overall CPI. In discussion with ONS this was judged the best way to inflation-adjust these series to match with the stolen goods trends.

categories: cash and related items like plastic cards and purse/wallets are excluded for obvious reasons. But there is also no series for mobile phones going back to 1996 (though an alternative source is available – see below); 'tools' and 'garden furniture/equipment' are covered by one category; and bicycles are only shown in a combined category with motorcycles. But even with these considerations, some general trends are clear. Firstly, the majority of items have *lost* value over time, relative to inflation. There is some similarity with the findings from the previous section. Part of the reason why the mean and median loss per incident of theft are lower in 2013/14 than in 1995 may have been because the value of the most stolen goods has also decreased overall.[21] These results**, like those in the previous section**, do therefore offer partial support to the theory that changes in value could have played some role in the crime drop. i.e. that some offenders may have been put off crime by the declining value they obtained from their stolen goods.

Figure 12 also suggests that there has been a great deal of variation in the price of different types of goods which are commonly stolen. According to the CPI, the value of clothes fell to around a third of its 1996 value by 2014, while computer equipment fell to around a tenth of its 1996 value. Motor vehicle parts and accessories, bicycles and motorbikes, tools and garden furniture decreased to a smaller degree while the value of jewellery and watches actually increased over the period.

Furthermore, it is important to bear in mind some of the limitations of the CPI data when interpreting these trends. These issues are explored in more detail in Technical Annex A, but the main point is that the CPI trends do not simply measure the change in the *retail* price of typical items over time. They also incorporate changes in quality that affect consumer preferences. As an illustration of the effect of this – the price of computers in the Argos catalogue for 1995 were compared with the Argos catalogue for 2014.[22] The average price of a computer in 1995 (£1,810) was more than three times the price in 2014 (£494). This is a fall in average price, but it is not as big as the drop suggested by the CPI. That is because computers in 2014 are far better than they were in 1995 and the CPI incorporates changes in the quality of products to some degree. However, to the thief who intends simply to re-sell the stolen computer, these changes in quality are irrelevant. All that matters is the re-sale value, which we might presume is some reasonably constant proportion of the retail value.

It is also important to recall the trends in individual crime types in light of the price trends illustrated in Figure 12. Whilst the average value per incident of theft fell overall, it increased for burglary. Looking at the most stolen items for burglary in 1995 and 2013/14 this is perhaps not surprising, see Table 7.

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[21] Other factors may also have contributed. For example, we have no accurate measure of the number of items stolen per theft incident. It is possible this also decreased. Or thieves may simply have become worse at selecting the most valuable items to steal.

[22] Argos is a British catalogue retailer operating in the UK and Ireland since 1973. For particular categories of goods like computers, stereos, etc., we looked at all the items on sale in the catalogue for 1981, 1995 and 2014. Descriptive statistics for these data is available in technical annex F.

Table 7 – Most stolen items in CSEW incidents of burglary, 1995 and 2013/14

1995		2013/14	
Item	% of burglaries in dwellings	Item	% of burglaries in dwelling
Cash	35.5	Cash	40.5
Other	35.3	Jewellery/watches	34.6
Jewellery	33.3	Computer equipment and laptops	28.2
Video equipment/camcorders	26.3	Mobile phone	17.5
Stereo/hi-fi equipment	21.6	Plastic card	13.7
Television	16.9	Purse/wallet	13
Camera	10.8	House keys	9.1
Purse/wallet	8.6	Games consoles	8.7
Clothes	8	Camera	8.7

Source: Crime Survey for England and Wales (CSEW) 2013/14

Notes: covers burglaries in dwellings with loss and thefts in dwellings.

Excluding the category 'other', the most stolen items in both years are cash and jewellery, with the latter actually rising in value, according to the CPI. Interestingly, computer equipment still features near the top of the 2013/14 list, illustrating the point about quality and re-sale value made above. The price of computers may have fallen and the quality of the item has certainly improved considerably, but to a thief all that may matter is that it remains a £500 piece of equipment, which is still worth stealing.

At best, then, these findings offer only mixed support for the hypothesis that changes in value played a role in causing the crime drop. The value of the typical basket of stolen goods in 2013/14 probably is lower than in it was in 1995, but perhaps not by as much as the component parts of the CPI would suggest. And value does not seem to offer a compelling explanation for why virtually all types of acquisitive crime started falling together in the mid-90s. If value were the principal determining factor, we might have expected numbers of burglaries in 2013/14 to be higher than in 1995.

Of course, even if value has played only a minor role in driving overall trends in thefts, it may have played a more significant role in changing the 'stolen goods mix' over time. We explore this now by comparing changes in value of a particular item with changes in the prominence of that item within total thefts. Figure 13 shows the proportion of CSEW crime incidents where clothing items were stolen with the corresponding Consumer Price Index (CPI) trend for clothing.

Figure 13– Incidents of theft involving clothing and Consumer Price Index for clothing and footwear (indexed 1997=1)
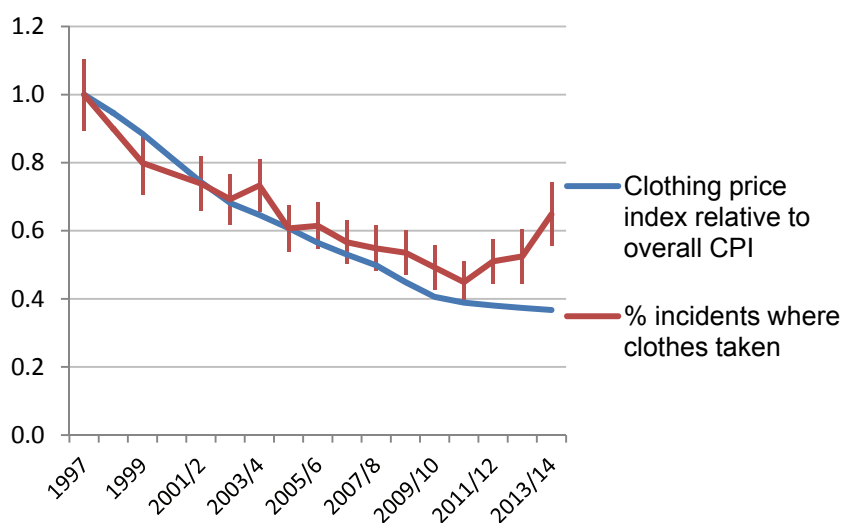
The price of clothing (as measured through the clothing CPI basket relative to overall inflation) and the proportion of thefts where clothes were stolen have all reduced markedly since the late 1990s (Figure 13). The correlation between the proportion of incidents and the clothing price index is very strong (.93) and is statistically significant. However, the divergence in the two trends in recent years (the proportion of thefts involving clothes has increased since 2010/11 while the value of clothing has continued to decrease albeit at a slower rate) casts at least a little doubt on how closely CPI value predicts thefts of clothes.

Figure 14– Average price of stereo/hi-fi and proportion of thefts where stereo/hi-fi was taken
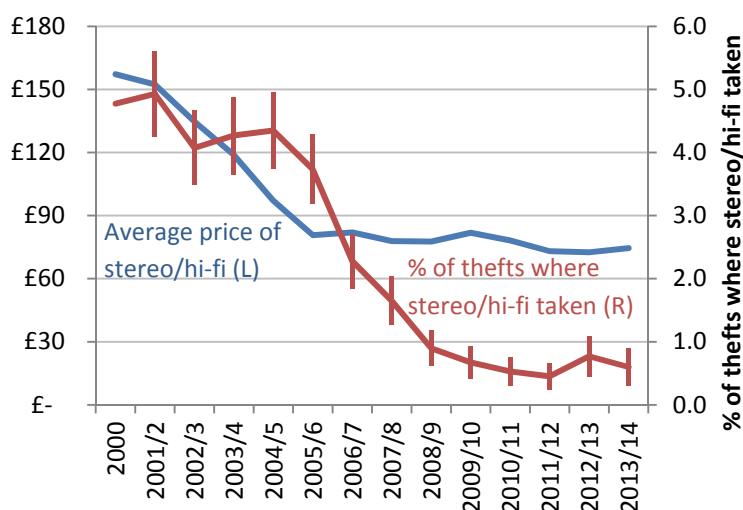
Notes: Monetary values inflation-adjusted to 2012/13 using the CPI.

The average price of stereos and hi-fis is substantially lower now (2013/14) than in 2000 (£75 down from £160) which loosely corresponds to the decreases in stereo/hi-fi theft (Figure 14). Despite this general relationship, the average price has stayed broadly the same since 2005/06 while thefts have continued to decrease.

These two examples suggest that decreases in the retail value of certain goods may be associated with decreases in popularity of these goods among thieves. Both examples, however, also show that value is not the only determinant of what items are stolen.

Figure 15 – Mobile phone ownership, price and thefts
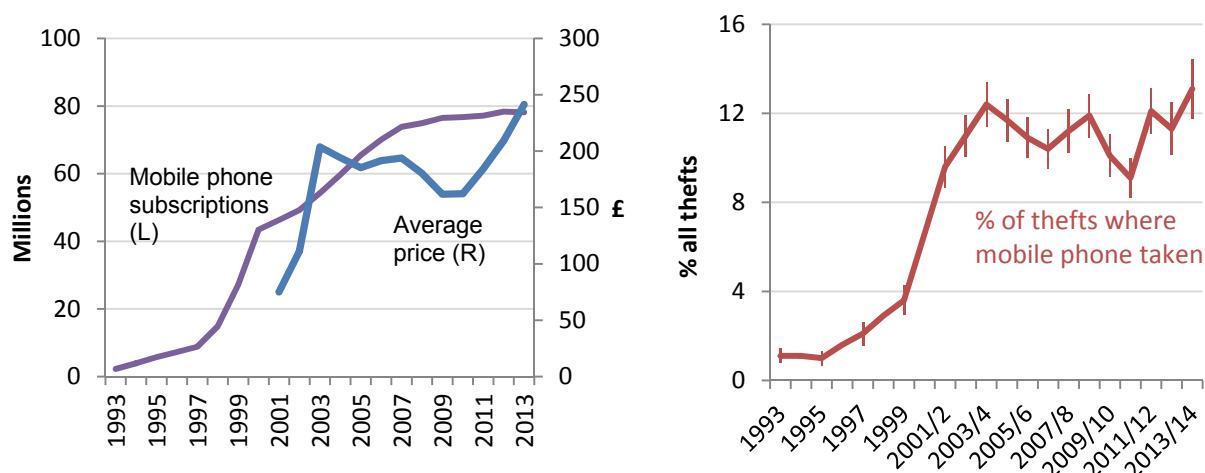
Notes: Monetary values inflation-adjusted to 2012/13 using the CPI.

Unlike the other goods examined in this section, mobile phones were new products in the early 1990s. For this reason, it makes sense to also look at the market penetration of mobile phones as well as their value.

The 'availability' of mobile phones for thieves increased substantially between the late 1990s and early 2000s, and there was also a marked increase in thefts of mobile phones over this period (Figure 15). However, the biggest increases in mobile phone theft came as the average price of handsets increased rapidly between 2001 and 2003. Once the price peaked in 2003 mobile phone thefts stopped increasing, and as the value decreased in the late 2000s and ownership stabilised, thefts decreased. This pattern offers some support to the product life-cycle hypothesis – i.e. where a product is in its life-cycle strongly influences the rate at which it is stolen. But it also suggests that value can exert an independent effect on the number of thefts of a particular product.

It could be said that the introduction of smartphones was a partial product life-cycle itself. As a share of all mobile phone sales, smartphones went from 16 to 48 per cent between 2009 and 2011. This shift is evident in the average price data in Figure 14 which increases after 2009. Again, thefts of mobile phones do seem to have increased a little after this point, though not by as much as might be expected.

Overall, the example of mobile phones gives some support to the idea that value is a key determinant in the trends of thefts of certain goods. But, as highlighted by Wellsmith and Burrell (2005), the life-cycle hypothesis does not seem all that suitable for 'partial product life-cycles', i.e. when a particular product is substantially revamped, such as in the case of the move from mobile phones to smartphones, and, as reviewed by Wellsmith and Burrell, the shift from CRT (Cathode ray tube) to flat-screen televisions.

Figure 16 – Incidents of theft involving jewellery and Consumer Price Index for jewellery and watches (indexed 1997=1)
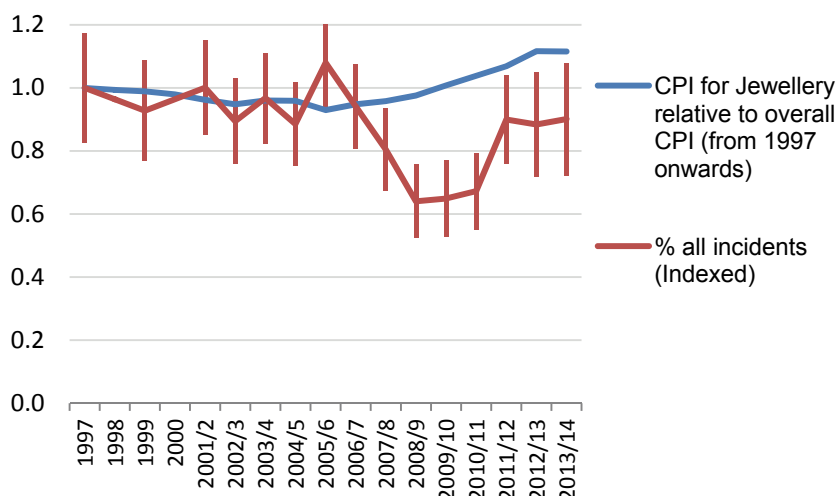
Compared with other goods, the proportion of thefts involving jewellery does not show any general long-term trend, although it has fluctuated. This would suggest that the value of jewellery has been broadly flat, which as Figure 16 shows, is the case, with a slight rise recently.

Two further examples from outside the scope of the CSEW also demonstrate the potential importance of value in driving trends of particular stolen items. During the late 2000s metal theft increased significantly in England and Wales. Research has subsequently demonstrated a very strong correlation between the rise in thefts and global metal prices (Sidebottom *et al.*, 2011). Other studies find a similarly strong relationship between gold prices and thefts of gold (Draca *et al.*, forthcoming). It is hard to tell whether the generally stronger correlations seen for mutually substitutable goods like metal is because it is easier to more precisely measure the value of these items (as they are unaffected by innovation) or because the relationships are genuinely stronger.

The second example highlights one of the limitations of this study. It is assumed that the relationship between retail price, the victim's estimate of loss and the *resale value* (the crucial aspect for the thief) is more or less constant, which is probably reasonable in general terms. But occasionally this relationship can shift suddenly. An example of this, which certainly affected crime trends, seems to have occurred in 2013. In September 2013 Apple introduced a new operating system for iPhones and iPads – iOS 7 – that made it significantly more difficult to use these products when stolen.[23] Anecdotal evidence suggests this markedly reduced the resale value of these products without affecting the retail value. A joint Home Office and The Behavioural Insights Team (2014) report demonstrated the change in phone-theft trends this created, but the effect is also visible in Figure 17. It shows the trend in incidents of (police recorded) theft from the person, many of which involve the theft of a phone.

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[23] Similar security improvements were made to smartphones from other brands.

Figure 17 – Police recorded theft from the person incidents, twelve-month rolling total

iOS 7
launched
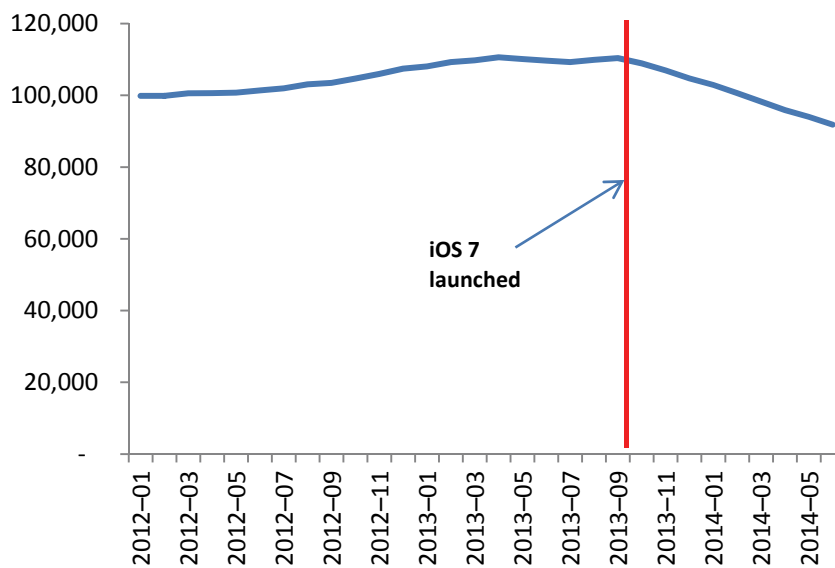
To summarise: value does not, by itself, provide a comprehensive explanation as to why some goods are stolen more often than others. This is evident from the cross-sectional picture of goods stolen, which has shown a high degree of consistency over time and in which some, not especially valuable, goods feature regularly. This is almost certainly because other factors, particularly accessibility and disposability, also matter. There is partial support for the hypothesis that a fall in the value of the most stolen items has contributed to the crime drop. With the important exceptions of cash and jewellery, available value trends are downwards, suggesting that some thieves may have been put off offending by value considerations, but some offences – notably burglary – just don't fit the pattern, casting doubt on the overall hypothesis. However, we do find numerous examples in which shifts in the value of goods have likely caused changes in the prominence of *individual items* within the stolen goods mix. For that reason, an understanding of how the value of items changes over time is important for policy.

4. Does the value of goods stolen affect reporting rates?

This section examines whether the value of stolen goods affects the likelihood of victims reporting the crime to the police.

One reason to study this is the impact on demand for the police and the wider criminal justice system. The previous sections have shown that changes in the value of stolen goods have probably been at best a minor driver of aggregate trends in actual crime. However, if greater value increases the *reporting* of crime then the demands on the police and criminal justice system will rise even if the actual number of crime incidents stays constant.

The relationship between value and police reporting is simple to investigate within the Crime Survey for England and Wales (CSEW) as victims are asked both about the value of items stolen and whether they reported the incident to the police. This relationship was explored across crime types and a consistent picture emerged. As expected, the incidents reported to the police had a consistently higher value of stolen goods compared with those that were not reported. This is illustrated in Figure 18 for theft from the person.

Figure 18 – Median value of stolen goods per incident of theft from the person, split between incidents reported to the police and unreported incidents
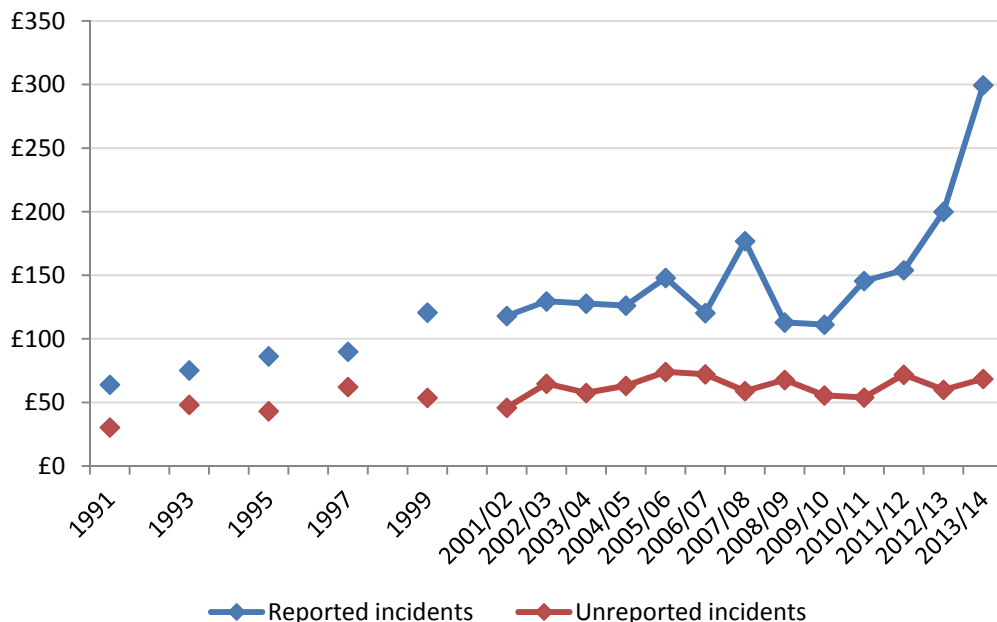
Source: Office for National Statistics (ONS), CSEW datasets.

Notes: Inflation-adjusted to 2012/13 values using the Consumer Price Index (CPI).

However, the relationship over time is slightly less clear-cut. It largely holds for total theft, in which there has been a slight reduction in both reporting rates (from around 45% in the mid-1990s to around 40% in recent years) and in the median value of goods stolen (see Figure 5).

However for theft from the person, the recent rise in the median value of stolen items, driven in all likelihood by the greater value of smartphones compared with traditional mobile phones, has yet to be reflected in a statistically significant rise in reporting rates, as demonstrated by Figure 19.

Figure 19 – Proportion of thefts from the person reported to the police
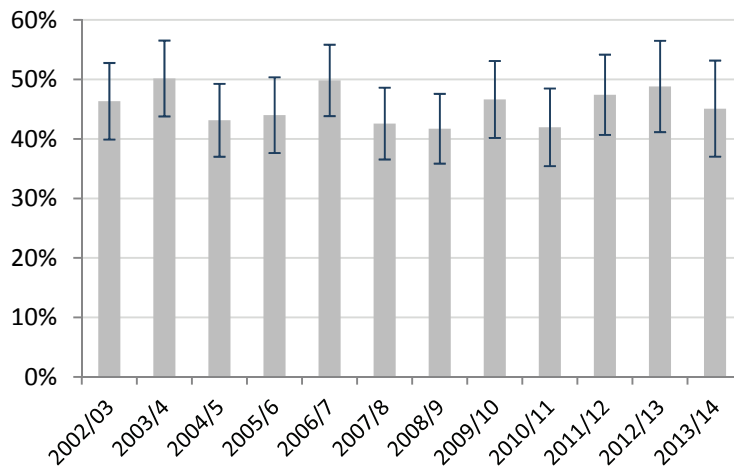
Conclusions

This paper uses data from the Crime Survey for England and Wales (CSEW) to attempt to answer a number of questions on the changing nature of stolen goods and its relationship to changes in crime.

One of the main findings is that the total value of all stolen goods, as reported by victims, has fallen by a greater extent than the number of incidents of acquisitive crime. This is due to a general fall in the mean value of goods stolen per incident. While there are short-term fluctuations in the mean value between years, there has been a statistically significant decrease between the early 1990s and the 2010s overall. One important implication of this first finding is that the fall in *economic harms* from acquisitive crime is understated by measures that look only at incidence.

The report finds that the main drivers of the fall in the overall value of goods stolen are the large reductions in incidents of vehicle theft and, to a slightly lesser extent, domestic burglary – the two offence types with the highest average loss. An implication of this is that future trends in vehicle theft and burglary are likely to have a strong effect on the overall economic harm from acquisitive crime.

Another key finding from this report is that the distribution of victim losses and criminal gain from acquisitive crime is highly skewed. That is, a small proportion of thefts account for a large proportion of the total losses. Correspondingly, the majority of thefts contribute little to the overall value of goods stolen. This finding leads to the conclusion that the mean value of goods stolen per incident, while essential to construct a 'total value of goods stolen' measure, does not accurately represent the *typical* gain to thieves per theft, as the mean is so greatly affected by rare and high-value thefts.

Instead, the median value (of goods stolen per theft) is used in this report to examine the relationship between the *typical* gain to thieves and trends in crime. There is no clear trend between the two, and as the median value in 2013/14 is not a great deal lower than in 1995, changes in the typical gain to thieves would seem to offer only a partial explanation for the crime drop.

Furthermore, neither is there a clear overall relationship between the number of incidents and the average values of thefts on an individual offence basis. While theft from the person is the offence that has fallen least since 1995, which may be linked to the increase in its average value per incident, there are contradictory trends for other offence types. For instance, the average 'haul' from a burglary has increased while the number of incidents has declined dramatically.

Nevertheless, analysis presented here provides relatively strong evidence that *shifts* in the value of *individual* goods are related to both the numbers of those items stolen and hence the relative prominence of these goods within total theft. For instance, the prominence of clothing items among all stolen goods has declined in line with their value and the relative prominence of mobile phones in thefts has increased during the rise of smartphones, which boosted both retail and resale prices.

This provides a role for policy, particularly if it can affect the most important aspect of value to the thief, the resale value, which is mostly closely linked to criminal gain and hence the motivation to steal. This is demonstrated clearly by the case of iOS 7, the more secure operating system that dramatically lowered the *resale* value of iPhones. This did not affect retail prices, but did drive a marked fall in phone-related theft from the person incidents, according to available data.

The degree to which reducing the resale value of a particular product would affect crime levels *overall* depends on to what extent thieves would simply switch to a different target or form of acquisitive crime. This report did not investigate this type of substitution in a systematic way, so this might therefore be a suitable area for further research.

Moreover, this research only addresses the *absolute* economic harm to society resulting from thefts. That is to say the financial wealth of individuals is not taken into consideration in any of the calculations in this report. However, it is obvious that an individual's wealth is an important factor when considering the economic harm of a theft– a loss of £100 would be considerable for some and negligible for others. Future research may wish to calculate the relative economic harm of thefts by accounting for the wealth of victims and perhaps whether the loss was covered by insurance.

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Technical annex A – Measuring the value of stolen goods

Value of goods stolen

As outlined in the methodology section, this report attempts to measure both the resale value of stolen goods and the loss to the victim using a number of data sources. This annex examines in more detail the potential limitations of the different estimations, and reasons for prioritising some data sources over others.

The loss to the victim

The Crime Survey for England and Wales (CSEW) asks victims of acquisitive crime to estimate the total replacement value of items stolen for each incident. Data from this are used in the report to calculate the average and total value of goods stolen for all incidents of theft, and for each type of theft. This is viewed as being the most accurate data source for this purpose, as it is reported by the victim who, it is assumed, knows more about what exactly was stolen than can be guessed from the categories provided by the survey. (For example, it is assumed that the victim will reflect the fact that the bicycle stolen from them was a particular model, which will be more accurate to its real value than using the average price of bicycles to estimate its value.)

However, the survey data do not naturally allow[24] a disaggregation of these total values by the types of goods stolen, apart from for the value of vehicles (and even then this is limited to the later years of the survey). Therefore, where necessary, other data sources are used (as detailed below).

Proxies for the resale value of stolen goods

The three sources of data used to estimate the resale value of goods are:

- price index data;
- average price data; and
- victim-reported value from the CSEW.

The CSEW data are seen to be the least problematic for reasons that are explained below.

Price index data

This report uses the Consumer Price Index (CPI) in a number of places, both to inflation-adjust

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[24] While the Home Office does use CSEW data in the 'Costs of Crime' to estimate the value for individual items, the process for this involves selecting those cases where only the item of focus was taken, which results in very small sample sizes for many of the items. This substantially reduces already limited statistical power, meaning that even large changes in value between years are not statistically significant. Therefore this approach was not seen to be useful in achieving this report's aims.

prices, but also, and problematically, to chart the changes of individual components of the price index.

The CPI is officially used by the Government as a measure of inflation, and is calculated by measuring the changing cost of a fixed basket of goods and services. In order for this basket to be truly fixed, the different items would ideally stay exactly the same in terms of quantity and quality. But as new products appear and old products change in specification, there are inevitable changes in *quality.* The frequent innovations in the world of computing are prime examples of this.

The Office for National Statistics (ONS) attempts to measure and take account of these qualitative changes through a number of methods, depending on the availability of prior data.[25] For the purpose of measuring inflation, this practice makes perfect sense. For example, the 20 per cent price increase between a new and old model of a laptop is misleading from the point of view of attempting to keep a 'fixed basket of goods' if the technical specification of the new model is twice as good.

For the purposes of this study, however, this adjustment to qualitative changes is not desirable – the interest is simply in the resale value of the good. The fact that the changes in quality to the laptop are worth more than the 20 per cent price increase is irrelevant. What **would be** relevant from this example is that members of the public may be carrying around a laptop that could be resold for approximately 20 per cent more than the previous model, and thus is potentially a greater target for thieves.

For this reason, price indices are only used in this report where there are no other appropriate data, and only for types of goods that have experienced comparatively little innovation (for example, clothing and jewellery).

The problem with both average price data and price index data

One particular issue arises when using average price data to estimate the resale value of a stolen good. The data are often calculated from a number of different items that form a 'basket' of goods. If it is the case that within these baskets certain models are stolen at disproportionately high rates, then the average price data will not necessarily reflect the average value of a stolen good. For example, if it is the case among smartphones that the most expensive models are stolen the most often, then average price data will systematically underestimate the average price of a stolen smartphone.

Victim-reported value

Therefore, where possible this report uses victim-reported values of the goods stolen, as it is likely that this is a more accurate estimate of the resale value of a stolen good. There are no quality-adjustment concerns, and the victim knows exactly what type of item was stolen and can estimate more accurately the value of it. However, because the value data cannot reasonably be broken down by product type, this report relies on average price data and price index data where appropriate. However, there are some general limitations to estimating the resale value of stolen goods common to all three sources.

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[25] See ONS CPI technical manual for more information: http://www.ons.gov.uk/ons/guide-method/user-guidance/prices/cpi-and-rpi/cpi-technical-manual/consumer-price-indices-technical-manual--2014.pdf

Stolen goods will often be sold or traded for less than their legitimate market values, which is mainly due to the desire for a speedy sale on the part of the seller (Stevenson *et al*., 2001; Sutton, 2008). If it were the case that the proportional difference between the legitimate market value and actual resale value – the 'scale-down factor' – was the same for all goods, the amount a thief would receive for it could be accurately calculated by 'scaling down' the victim-reported value of the item. However, the scale-down factor is likely to be different between goods for the following reasons.

- **The type of buyer makes a difference.** Stevenson *et al*. (2001) find that thieves get worse deals selling or trading with drug dealers than doing so with a legitimate business. One implication of this is that if certain goods are statistically significantly more likely to be targeted by drug addicts – for example, relatively small-value goods – then the proceeds received for such goods may be overestimated.
- **Some goods keep their value better.** In Stevenson *et al.'s* study (*ibid.*), thieves would get up to 38 per cent of a video cassette recorder's retail value, compared to a maximum of 25 per cent for a gold ring's retail value.

As there are only piecemeal data on the particular effects of these two points, it is not possible to account for them, and therefore not possible to estimate the ***actual*** proceeds that thieves gain from these crimes.

Technical annex B – CSEW questions on being offered stolen goods

Between 2002/03 and 2007/08 the CSEW included a number of questions which asked respondents whether they had been offered suspected stolen goods.

These questions were only asked of a sub-sample of respondents, the size of which varied substantially between years. For instance, more than 11,000 respondents were asked in the 2002/03 survey whether they had been offered suspected stolen goods in the past five years. But fewer than 800 respondents were asked the same question in the next year's survey (table A).

Table A - Whether offered suspected stolen goods in past 5 years, %

	2001/02	2002/03	2003/04	2005/06	2006/07	2007/08
Yes	19.0%	20.0%	20.0%	14.4%	12.8%	14.3%
No	81.0%	80.0%	80.0%	85.6%	87.2%	85.7%
Unweighted base	2,612	11,751	752	6,753	467	6,613

Source: CSEW datasets

Notes: this questions did not feature in the 2004/05 survey. Unweighted base excludes 'Don't know' and 'Prefer not to say' responses.

Despite the limited time range and the variability in sample sizes, there were some statistically significant changes over the period. The proportion of people offered goods in the past five years that they believed were stolen decreased from 19 per cent to 14 per cent between 2001/02 and 2007/08 (table A; p<.001). Similarly there were small falls in the proportion of people offered suspected stolen goods in the past twelve months – 10 per cent to 8 per cent between 2001/02 and 2007/08 (p<.01, table B).

Table B - Whether offered suspected stolen goods in past 12 months, %

	2001/02	2002/03	2003/04	2005/06	2006/07	2007/08
Yes	9.9%	10.6%	8.7%	8.0%	6.1%	7.9%
No	90.1%	89.4%	91.3%	92.0%	93.9%	92.1%
Unweighted base	2,608	11,741	751	6,726	467	6,590

Source: CSEW datasets

Notes: this question did not feature in the 2004/05 survey. Unweighted base excludes 'Don't know' and 'Prefer not to say' responses.

Technical annex C – Data processing and manipulation

The information below sets out the data processing steps used for this report, so that others may attempt to replicate the analysis.

One initial thing to point out is that, in line with Office for National Statistics (ONS) publications,[26] for the years prior to 2001/02, this report labels the surveys as representing the prior year. That is to say that the dataset labelled '1996' is reported as 1995. This should avoid any confusion resulting from the discrepancy between the titles of datasets that one might access, and the years referred to in this analysis.

Nearly all uses of Crime Survey for England and Wales (CSEW) data in the main body of the report apply the incident weight 'weighti' found in all datasets to account for unequal probabilities of being sampled, non-response bias, and to broadly represent the population of England and Wales. For significance tests of the difference between years, weighti is transformed into a weight that does not inflate the sample size – that is, the new weight accounts for unequal probabilities of being sampled and non-response bias, but is not multiplied up to be nationally representative. If this is not done, statistical power is artificially inflated. The formula below, recommended by the developers of SPSS[27], outlines the method of calculating this new weight:

New weight = old weight * (unweighted sample size/sum of old weights).

Processes for Section 2 – How the total value of stolen goods has changed

To estimate the total value of goods stolen each year, this analysis multiplies the mean value of loss per incident by the number of incidents of acquisitive crime with loss. The specifics of these steps are outlined below.

- **Calculate the mean value of goods stolen per incident.** One of the key variables exploited in the CSEW datasets is called 'totvalue' – this is the victim's estimate for the total value of all goods stolen in each theft. However, it is not sufficient to use this variable in its raw form for the following reasons.

  - Apart from the dataset covering 1991 and 1993, this variable does not cover incidents where a vehicle was stolen. For these types of incidents, two other variables are used – the victim's estimated value of vehicle stolen (valveh*)* and the value of any other items stolen (othvalh). In order to get a mean measure for all

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26 Such as *Crime in England and Wales*: http://www.ons.gov.uk/ons/rel/crime-stats/crime-statistics/period-ending-march-2014/stb-crime-stats.html .

27 See the advice here: http://www-01.ibm.com/support/docview.wss?uid=swg21488571 .

incidents each year, therefore, a new variable that encompasses all three values is computed for this analysis.

- Recent surveys ask respondents for just the **replacement** value of goods stolen, whereas some of the earlier years of the survey (those covering years 1993, 1995) allow respondents to estimate either the *replacement* or *actual* value of goods stolen. To have consistency across the survey years, those cases that gave an *actual* value (signified by actvalue being '2') are excluded from this analysis. This has the unfortunate effect of reducing the sample size for these two years.
- The resulting values are then inflation-adjusted to 2012/13 using Consumer Price Index (CPI) data from ONS to allow for meaningful comparisons between years. (The 2012/13 data are used as the 2013/14 dataset was only released toward the end of this analysis.)

- **Multiply this mean figure by the number of incidents of theft with loss from official ONS figures. These figures can be found in the Crime in England and Wales, year ending March 2014 statistics. The relevant offences are:**

  - robbery;
  - snatch theft;
  - stealth theft;
  - other theft of personal property;
  - domestic burglary with loss;
  - theft from a dwelling;
  - theft from outside a dwelling;
  - theft from vehicles;
  - theft of vehicles; and
  - bicycle theft.

The reason for using these figures for the number of incidents, and not those derived from the datasets is that ONS has adjusted the incident figures for the 2000s in light of the findings from the 2011 Census. However, the datasets of the CSEW that are publicly available do not feature 'reweighted' weights.

Most pieces of analysis in Section 2 use a similar method as above. For example, the exact same variables and processes are used to calculate the median value. Similarly the total value of goods stolen in 'theft from the person' is calculated in exactly the same way as the steps outlined above, except that only incidents of this offence type are included.

The data behind Table 4, however, highlights a different way of calculating the total loss from acquisitive crime. This approach multiplies the individual mean of each offence type by the number of incidents for the corresponding offence type (as published by ONS), and then sums the products of all offence types. For example, for 2013/14 the mean value of goods stolen in 'other theft' (£286) is multiplied by the number of incidents of 'other theft' (950,000), and is added to the same products of all other offence types. This method results in a marginally different total value for nearly all years, apart from 1993 and 1995 where the differences are a little more pronounced (Figure A).

Figure A – Comparison of two methodologies to calculate the total value of goods stolen in personal and household acquisitive crime with loss
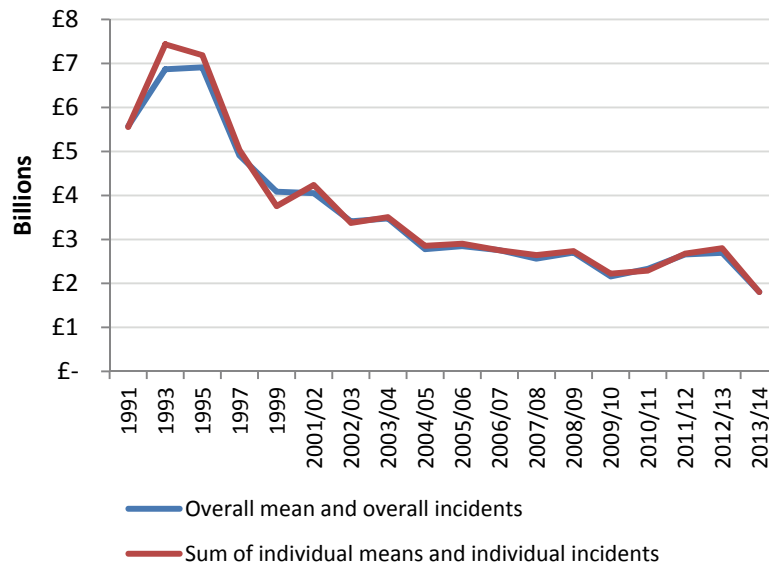
The reason for the discrepancy is ultimately due to non-response and missing data. If a higher proportion of victims of a high value crime type (e.g. burglary) do not respond with a valid value (e.g. refusal or 'do not know'), this would reduce the number of these high values in the sample used for the 'overall mean' method – thereby underestimating the total value of goods stolen. This issue would not affect the method that uses the sum of individual means, as the weight of different offence types remains in line with ONS published data. Again, however, in practice the resulting difference between the two methods is generally very small, and the overall trend is not affected. The main reason for not using the method that uses individual means is that computing confidence intervals, significance tests, and pooling different survey years becomes substantially more complex. And the differences between the results of the two methods were not deemed large enough to merit this significant increase in methodological complexity.

The method that yields the lower values in 1993 and 1995 is used in significance tests of the difference between the mean value of goods stolen in the 1990s and 2010s. Therefore, the statistical significance of the fall in the mean value of goods stolen as reported in the main body is, if anything, slightly understated.

Processes for Section 3 – What items are stolen most frequently?

Each dataset has numerous variables detailing what items were stolen in each theft. For surveys after the year 2000 these variables begin with 'whatst...'. For the datasets covering earlier surveys, the variable names vary. Given that detailing the names of each item in each survey would result in a list of 650 items, here is not the place to detail the different variable names. Documentation bundled with each dataset provides these variable names.

While some items, such as clothing, feature in every survey there have been many changes to the numbers and types of items covered across the past three decades. For instance, the dataset covering 1983 covers 16 items, but the 2010/11 dataset covers 46 items. Therefore, to achieve a relatively consistent time series, all items are sorted manually. Only the 37 items that featured in at least seven different surveys are included in the analysis – some items that do not match across survey years exactly in name (for example, credit card one year, plastic card another) are treated as one item. This process was reached iteratively, and is considered to

maximise the number of items covered, while allowing for adequate and accurate analysis of trends.

The proportion of all thefts where each item was taken is then computed. To get a number of incidents where a particular item was taken, the proportion is multiplied by the ONS incidence figure for all acquisitive crime with loss (as detailed earlier). Only the most frequently stolen items are shown in this report as items stolen less frequently have proportionally larger confidence intervals that inhibit interpretation of trends across time.

If no items from the surveys are excluded (e.g. purses and wallets are excluded in the main text as these are most likely stolen for their contents rather than their resale value), and if no attempt is made to make wholly consistent categories across the surveys, the most stolen goods from every year will appear as shown in Table C.

Table C – Most stolen goods in each CSEW survey year

	1st	2nd	3rd	4th	5th	6th
1981	Motorvehicle parts/accessories	Cash	Other	Clothes	Car/van	Bicycle
1984	Other	Cash	Motorvehicle parts/accessories	Purse/wallet	Bicycle	Jewellery
1987	Other	Motorvehicle parts/accessories	Cash	Purse/wallet	Bicycle	Stereo/hi-fi
1991	Other	Motorvehicle parts/accessories	Cash	Clothes	Tools	Purse/wallet
1993	Other	Motorvehicle parts/accessories	Cash	Clothes	Purse/wallet	Tools
1995	Other	Cash	Motorvehicle parts/accessories	Clothes	Purse/wallet	Tools
1997	Other	Cash	Motorvehicle parts/accessories	Purse/wallet	Clothes	Tools
1999	Other	Motorvehicle parts/accessories	Cash	Tools	Clothes	Purse/wallet
2001/02	Cash	Motorvehicle parts/accessories	Purse/wallet	Garden equipment	Mobile phone	Other
2002/03	Cash	Motorvehicle parts/accessories	Purse/wallet	Garden equipment	Mobile phone	Credit card
2003/04	Cash	Motorvehicle parts/accessories	Purse/wallet	Mobile phone	Garden equipment	Credit card
2004/05	Cash	Motorvehicle parts/accessories	Purse/wallet	Other	Mobile phone	Garden equipment
2005/06	Cash	Motorvehicle parts/accessories	Purse/wallet	Mobile phone	Garden equipment	Credit card
2006/07	Cash	Motorvehicle parts/accessories	Purse/wallet	Garden equipment	Bicycle	Mobile phone
2007/08	Cash	Motorvehicle parts/accessories	Mobile phone	Purse/wallet	Garden equipment	Bicycle
2008/09	Cash	Motorvehicle parts/accessories	Purse/wallet	Mobile phone	Bicycle	Garden equipment
2009/10	Cash	Motorvehicle parts/accessories	Bicycle	Garden equipment	Purse/wallet	Mobile phone
2010/11	Cash	Motorvehicle parts/accessories	Bicycle	Garden equipment	Purse/wallet	Mobile phone
2011/12	Cash	Motorvehicle parts/accessories	Garden equipment	Mobile phone	Bicycle	Purse/wallet
2012/13	Cash	Motorvehicle parts/accessories	Bicycle	Garden equipment	Mobile phone	Purse/wallet
2013/14	Cash	Motorvehicle parts/accessories	Mobile phone	Bicycle	Garden equipment	Credit card

Source: CSEW datasets

Technical annex D – Statistical tests

To test that it is not just the difference between 1995 (the year with one of the highest mean values) and 2013/14 (the year with one of the lowest mean values) that is statistically significant, and that it can be claimed more generally that the average value of thefts has been lower in recent years than in the early to mid-1990s, survey years are pooled together. As the main text shows, very high-loss thefts greatly affect the mean. These very rare incidents are not necessarily covered well by smaller samples, so effectively increasing the sample size should smooth out any fluctuations in the occurrence of these very high-value thefts that may be due to sampling variation.

Table D – Mean value of items stolen per theft, using pooled sample years, t-tests of difference between inflation-adjusted mean value of items stolen

	Year(s)	Sample size	Mean	p-value
4-year pools	1991, 1993, 1995, 1997	11,939	£680	.0000
	2010/11–2013/14	18,472	£552	
3-year pools	1993, 1995, 1997	9,207	£681	.0006
	2011/12–2013/14	12,895	£564	
3-year pools	1991, 1993, 1995	7,956	£722	.0000
	2011/12–2013/14	12,895	£564	

Source: CSEW datasets

Notes: Independent samples t-tests, assuming unequal variances.

Table D shows that the difference between the mean value of goods stolen in the early-mid 1990s and the 2010s is statistically significant ($p<.001$), and that this finding is consistent across different pools. It can be said with a high degree of certainty, therefore, that we have seen a decrease in the average loss per theft since the crime peak. While the value data are not normally distributed, the central limit theorem states that with a sufficiently large sample, this non-normality should not bias confidence intervals or t-tests.

However, as a form of triangulation, non-parametric methods are also used. The Mann-Whitney *U* test does not require normally distributed data, and is used here to test whether the distribution of one year of the survey can be assumed to have come from a different population than that of another survey year. Repetitions of the pooled year tests in Table D, this time with the Mann-Whitney test, result in *U* values that are statistically significant ($p<.001$), meaning it is reasonable to assume that the value of goods stolen in the 1990s was distributed differently than in the 2010s.

(However, re-sampling methods, such as bootstrapping, may be considered in further research

to test the robustness of these findings.)

Table E shows the difference in mean values for single and pooled years in the 1990s and 2010s, by crime type. The table shows that the rise in the average value of goods stolen in burglaries between the early-mid 1990s and 2010s was statistically significant. So was the fall in the average value of vehicle theft, though this is only statistically significant at p<.10.

Table E – Differences between mean values of goods stolen between the 1990s and 2010s for the offence types shown in Table 3

Four year pools	91,'93,'95,'97	2010/11-2013/14	Significance (t-test)
Theft of motor vehicle	£ 4,999	£ 4,244	*
Burglary in dwelling	£ 2,162	£ 3,169	***
Theft of bicycle	£ 322	£ 302	-
Other theft of personal belongings	£ 322	£ 332	-
Theft from person	£ 124	£ 200	***
Theft from motor vehicle	£ 297	£ 230	**

Individual years	1995	2013/14	Significance (t-test)
Theft of motor vehicle	£ 5,610	£ 4,370	-
Burglary in dwelling	£ 1,970	£ 2,420	-
Theft of bicycle	£ 390	£ 330	-
Other theft of personal belongings	£ 530	£ 290	***
Theft from person	£ 90	£ 250	***
Theft from motor vehicle	£ 310	£ 230	**

Source: CSEW datasets

Notes: '-' p>.10 ; * p<.10; ** p<.05 ; *** p<.01.

Technical annex E – US Burglary Data

Table F – National Crime Victimisation Survey data on completed household burglaries in the United States.

Year	Completed household burglaries	Rate per thousand households	Median value of items and cash stolen	Mean value of items and cash stolen
1994	5,261,200	52.5	$389	$1,672
1995	4,998,500	49.5	$379	$1,612
1996	4,650,000	45.5	$402	$1,681
1997	4,413,500	42.7	$420	$1,866
1998	4,026,800	38.5	$413	$1,947
1999	3,598,100	33.9	$413	$1,851
2000	3,296,600	30.6	$405	$1,604
2001	3,067,800	28.2	$444	$1,515
2002	2,872,400	26.1	$500	$1,754
2003	2,928,500	26.1	$406	$1,829
2004	3,071,800	26.7	$366	$1,902
2005	3,047,700	26.2	$368	$2,166
2006	3,052,800	26.0	$460	$2,317
2007	2,979,200	25.1	$541	$2,344
2008	2,866,100	23.8	$522	$2,425
2009	2,872,200	23.6	$522	$2,596
2010	2,769,100	22.6	$618	$2,588
2011	2,845,500	23.1	$600	$2,116

Source: Walters et al. (2013), appendix table 1 (p.12) and appendix table 4 (p.13).

Notes: Monetary values inflation-adjusted to 2011 using the Consumer Price Index for All Urban Consumers.

Technical annex F – Argos data

Data on the price of items from Argos catalogues were sourced from retromash.com, which contains PDF versions of the catalogues going back to 1973. Prices for all the available items on sale for selected categories of goods were collected for the 1981, 1995 and 2014 catalogues and descriptive statistics produced. The results are shown in Table G.

Table G – Argos data, descriptive statistics

			1981		1995		2014
TVs	n		10		31		192
	Min	£	185	£	88	£	84
	Max	£	1,068	£	1,301	£	2,368
	Mean	£	446	£	523	£	401
			1981		**1995**		**2014**
Stereo/hi-fi systems	n		4		27		38
	Min	£	471	£	80	£	23
	Max	£	906	£	731	£	521
	Mean	£	672	£	402	£	143
			1981		**1995**		**2014**
Computers	n		n/a		13		68
	Min		n/a	£	562	£	151
	Max		n/a	£	2,432	£	1,611
	Mean		n/a	£	1,810	£	494

Source: Argos catalogues from retromash.com

Notes: - Prices inflation-adjusted to 2012 using RPI (CPI estimates unavailable for before 1987).

The first thing to note is that there has been a trend towards more items being available in the catalogue, with a wider range of prices. Despite the CPI price indices' trends, which suggest that consumer electronic items dropped to just a tenth of their 1995 value in 2014 (Figure 12), these trends suggest a more nuanced picture because they do not take into account changes to quality (which we presume is of no real consequence to the thief intent on selling the good on). Average prices of televisions have stayed reasonably constant, while computers and stereos have dropped to between a third and a quarter of their 1995 values by 2014. Note also that, when inflation-adjusted, the prices of stereos fell through the period in which crime was rising.

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