

# MEASURING RETAIL SHRINKAGE: TOWARDS A SHRINKAGE KPI



AN  
ECR EUROPE  
WHITE PAPER

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## **MEASURING RETAIL SHRINKAGE:**

*TOWARDS A SHRINKAGE KPI*

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## Executive Summary – A Viewpoint from the ECR Europe Shrinkage Working Group

There is a need to measure shrinkage in order to determine its extent and trend. This white paper presents a review of shrinkage measurement in grocery retail and the findings from a survey of European companies in this sector. The ECR Europe Shrinkage Working Group reviewed this research and together we have drawn the following recommendations on how retail shrinkage should be measured:

- Shrinkage should be measured throughout the supply chain, i.e. at stores and in the distribution network.
- Measure both known and unknown shrinkage.
- Record shrinkage by individual reference (stock keeping unit) and by individual store / distribution centre / transport route. This will allow hot products and hot locations to be identified, where action is needed first.
- Share your shrinkage result. Shrinkage should be reported at cost price for accounting purposes. Shrinkage should also be reported at retail price to highlight its importance and to motivate collaborative performance improvement.
- Shrinkage should also be reported as a percentage of turnover to allow comparison between firms.
- Count as often as possible. Data on shrinkage should be gathered and reported widely through the organisation and with suppliers, at least two times per year. For Hot Products (products with exceptional levels of shrinkage) counting should be increased to at least once per month.

We recognise that measurement by itself will not reduce shrinkage. However establishing a measure within your business is the first step to action. This data will underpin your analysis and dissemination of findings to key stakeholders who can act to reduce losses. Also the establishment of a measure provides a common language across Europe's retail community so we can collaborate with each other and our manufacturing partners in order to deliver the goal of reduced shrinkage.

- The ECR Europe Shrinkage Working Group

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# 1 Introduction

Grocery retailing is a significant industrial activity with a turnover in Europe that exceeded €1000 billion in 2003<sup>1</sup>. This business sector can be characterised as a complex, highly competitive market made up of a diverse population of organisations. This complexity is a result of the nature and structure of the sector. The number and variety of shoppers is as large and diverse as the population of Europe. These customers consume a vast amount of goods from a wide and changing product assortment. The ability to get goods to the right places at the right time requires a logistical network stretching from the numerous places where products originate to the shelves of tens of thousands of stores. The diversity in the sector comes from the differences in the characteristics of its constituent companies such as size; geography; maturity, and; product and service offering.

Across this varied business landscape cuts the common issue of shrinkage. There are a range of different views on this issue with some organisations treating it as a regrettable but inherent part of doing business while to others it is a key opportunity to improve returns. Recent research into this topic has shown it to be an important issue for organisations to consider, not least because shrinkage costs Europe's FMCG grocery industry €24 billion in 2003<sup>2</sup>.

The role of measurement is critical to all aspects of management and this is certainly the case when it comes to the management of shrinkage. Measurement systems guide management decisions and individual metrics are the building blocks of a complete measurement system. In order to manage shrinkage it is clear that the right metrics must be in place. The objective of this white paper is therefore to present a view on the measurement of retail shrinkage and the role this plays in guiding management decision making with the specific aims of:

- Reviewing the topic of shrinkage measurement in order to list and describe alternative approaches and methods.
- Establishing the extent to which alternative approaches and methods are employed in practice.
- Identifying the implications for shrinkage management of the findings from our survey of measurement practices.

The method used to deliver against these aims is described below, which is followed by the findings from the research.

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<sup>1</sup> Beck, A. (2004) *Shrinkage In Europe 2004: A Survey of Stock Loss in the Fast Moving Consumer Goods Sector*, ECR Europe, Brussels.

<sup>2</sup> Beck (2004) *ibid*.

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## 2 Methodology

In order to achieve the aims of this research, a review of shrinkage measurement approaches and methods was conducted. The findings of this review were used as a basis on which to construct a questionnaire. This questionnaire was employed to survey the shrinkage measurement practices of European grocery retailers.

The review of shrinkage measurement approaches and methods were undertaken in three iterations of a procedure consisting of exploration of the theoretical base in the literature followed by a practitioner review of this material. This method approximates to deductive-inductive data analysis, i.e. the constant reflection of empirical against theoretical studies.

The literature review was a desk research exercise conducted by the two academics from Cranfield University who authored this white paper. The findings of the literature were presented to the ECR Europe Shrinkage Working Group, who critiqued the findings. These practitioners represent separate retail and manufacturing companies from across Europe. They were known to each other and meet on a bi-monthly basis. Gaps in the literature review highlighted by the practitioner panel were addressed by the subsequent iteration of literature review. The output of this exercise was a list and description of alternative approaches and methods to shrinkage measurement.

The findings from the review of approaches and methods provided an input to the construction of a questionnaire for a survey of shrinkage measurement practices. The necessary questions were incorporated into the 2004 ECR Europe Shrinkage Survey, which was issued to 250 retailers that operate in Europe. The response rate to the survey was 13.7 %.

The findings from the survey were coded and compiled into a spreadsheet for analysis. The results of this analysis were discussed and conclusions drawn on the implications of this research to shrinkage management. These conclusions were presented for review to the ECR Europe Shrinkage Working Group and at the Shrinkage Breakout Session of the 2004 ECR Europe Congress, attended by 210 people. The oral and written feedback from these events was used as a gauge of the practical implications of the research.

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### 3 Review of Shrinkage Measurement

A review of existing work on shrinkage measurement was conducted to identify alternative approaches and methods. This review identified a range of issues as being necessary for consideration when measuring shrinkage. These issues were classified into the following five categories:

- Definition of shrinkage.
- Perspectives on shrinkage.
- Delimiting the scope of shrinkage measurement.
- Method of calculation.
- Method of valuation.

These issues associated with these categories are discussed below.

### 4 Definition of Shrinkage

Clarity and consistency are required when measuring in order to ensure that like is measured with like and that each measurement is compatible. Hence there is a need to define shrinkage and to do so in a simple and clear manner.

In a simplistic view, the value of a product is a function of several factors including its being in the right place at the right time and possessing an appropriate level of quality. This value will be compromised if these factors fail to meet customer expectations. For example, if a product is damaged and its quality is compromised so its value will be reduced. Similarly, value can be reduced if goods are not available at the right time or if they are not in the right place. In the grocery retail environment the value of a good is represented by its intended sale price. Any loss of value in a product is assumed here to be represented through a mark down in its sales price or by writing off the good when it can no longer be sold.

The most extreme reduction in value is when it reduces to zero. This can happen for the reasons described above and also when goods cannot be physically accounted for. Goods that cannot be accounted for will be identified when there is a discrepancy between book stock and physical stock. The book stock is the record of those goods held by the company and calculated as follows:

Book stock = Results from last physical stock count + net movements

where,

net movements = (purchases + incoming transfers)-(sales + outgoing transfers)

Discrepancies between book stock and physical stock will come to light following a physical audit of a company's goods, such as a stock take. In a stock take the goods physically recorded in the audit are compared to the book stock and differences are recorded.

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A retailer incurs a loss when a good is sold for less than its intended price, i.e. there is some intended sales income that was not realised and also when the intended sales income from products cannot be realised because of stock loss. It is proposed that these losses are what lie at the heart of the shrinkage issue. A concise definition of shrinkage that seeks to capture this phenomenon is:

*Intended sales income that was not and cannot be realised*

This definition is intended to be clear and simple. This should allow the definition to be more easily communicated to the broad range of people that need to be engaged in addressing shrinkage.

## **5 Perspectives on Shrinkage**

Several perspectives exist on the nature of shrinkage and any measurement system will be guided by the principles employed in its design. It is common for these guiding principles to be unspoken and for a measurement system to develop from them intuitively. In order to treat shrinkage measurement in a rational manner it is necessary to first consider the key perspectives that relate to retail shrinkage and explore lines of difference in how shrinkage can be viewed. Only once these perspectives have been addressed and decisions made on which guiding principles to adopt can measures be designed and deployed.

The debate how to approach the measurement of retail shrinkage is explored here by considering the four following perspectives:

- Stewardship and performance improvement.
- Cost reduction and sales improvement.
- Local effects of systemic issues.
- The detailed nature of retailing.

Naturally there are limits to what can be achieved by reducing the debate to these four areas. However the merit in doing so is to aid understanding and introduce a series of lenses for viewing the true richness of the retailing sector. These perspectives are introduced and discussed below.

### **5.1 Stewardship and Performance Improvement**

Shrinkage measurement can be viewed from the perspectives of ‘stewardship’ and ‘performance improvement’. At their extremes, these two issues sit at opposite ends of a spectrum. The difference between them is that stewardship considers ‘what is’ while performance improvement considers ‘what could have been.’

Stewardship implies the safe and conservative running of an operation along prescribed lines. Shareholders oblige the management team to be stewards of their invested capital and an accounting view of shrinkage is therefore typically geared towards stewardship. For example the stewardship perspective requires the value of goods to be presented as the lower of purchase cost or net realisable value.



Performance improvement implies delivering change to maximise return. Shareholders oblige management teams to maximise their return on investment, that is to protect and improve the value of their shareholding in a company and to ensure the company's long term profitability. In order to achieve this, the management team need to identify areas of sales and cost underperformance and direct effort to resolve them. Measurement from this perspective seeks to highlight forgone profits that result from shrinkage.

The characteristics of the stewardship and performance improvement perspectives are summarised below in Table 1.

<b>Characteristics</b>	
<b>Stewardship</b>	<ul style="list-style-type: none"> <li>• Follows accounting principles.</li> <li>• Cost is an objective measure.</li> <li>• Uniform approach.</li> <li>• Allows comparison with others that follow this line.</li> <li>• Conservative.</li> <li>• Retrospective.</li> <li>• Does not consider the effect of lost sales.</li> </ul>
<b>Performance Improvement</b>	<ul style="list-style-type: none"> <li>• Considers foregone profits resulting from lost sales.</li> <li>• Focuses management attention on improving profitability.</li> <li>• Drives results.</li> <li>• Risks overstating the scale of losses.</li> <li>• Calculations of lost sales are subjective.</li> </ul>

**Table 1. Characteristics of Stewardship and Performance Improvement Perspectives**

The common ground between these two perspectives is that they both emphasise that decisions need to be based on reliable information. A common measurement system could satisfy both sets of requirements through collating and distributing performance data, which can then be manipulated to meet both sets of needs. In doing so, the managers would fulfil their dual roles as corporate stewards and as business leaders.

## ***5.2 Cost Reduction and Sales Improvement***

Shrinkage is a cost and reduction in this cost generally presents a profit opportunity in the grocery retail industry. Some observers and practitioners view shrinkage simply in terms of reducing this cost, however the profit opportunity available from effective shrinkage management extends further. Additional profit opportunities exist from increasing sales through improving the characteristics that shoppers seek. These characteristics include:

- Value for money shopping.
- On-Shelf Availability.
- One stop shopping.
- Good shopping experience.
- Safe visit.

Each retailer will have their own marketing mix that responds to and satisfies these characteristics in a variety of ways that are designed to best serve their market niche.

Shrinkage reduction can affect these characteristics, resulting in an opportunity to increase sales. A description of the sales improvement opportunities associated with shrinkage reduction is presented in the table below.

Characteristic	Shrinkage Reduction Sales Improvement Opportunities
Value for money shopping	Reduction in shrinkage costs and cost effective shrinkage management leveraged to reduce price of goods and drive sales.
On-Shelf Availability	Automated store replenishment triggers reordering when sales reduce recorded inventory below a threshold. Shrinkage can cause stock outs to occur before the inventory reordering threshold is reached. Once this situation is reached further sales cannot occur. Replenishment will not be triggered until the inventory record is manually reset. Reduction in shrinkage will improve OSA, which will improve sales.
One stop shopping	Fear of shrinkage can prevent retailers stocking items perceived as being at risk. Overcoming the threat of shrinkage encourages the retailer to stock a wide assortment.
Good shopping experience	Fear of shrinkage can lead retailers to defensively merchandise products. Removing the causes of shrinkage and implementing alternative solutions that counter the threat of shrinkage can allow goods to be openly merchandised. Open merchandising improves the shopping experience and tends to increase sales.
Safe visit	Overt security measures and a hard-line attitude by employees can promote a perception amongst shoppers that there is a threat to safety. Sensitive yet robust operations management can provide a safe environment in which to work and shop that is compatible with a good shopping experience.

**Table 2. Shrinkage Reduction Sales Improvement Opportunities**

In addition to the sales growth opportunities associated with reduced shrinkage, there are sales growth opportunities associated with increased shrinkage. When supermarkets moved to self selection in the 1950's the uplift in sales this modern approach to retailing brought would have been tempered by increased shrinkage. Presumably the benefits outweighed the costs and hence the whole industry moved to self selection. More recent examples of retail changes that were introduced despite increases in shrinkage include:

- Self scanning - shoppers scan their own shopping as they go around the store and pay at an unstaffed checkout. Mistaken failure to scan some items and shoplifting seem to increase with this method.
- Fresh produce promotion – Some retailers differentiate themselves by having a full and well stocked range of fresh produce available at all times. This strategy increases the risk of goods going past their sell-by date.

Overall, the management of shrinkage needs to be recognised as having an effect on both the costs and the sales of a retailer. Shrinkage can therefore be viewed as providing the grocery retail industry with a rare occasion for profit enhancement through both reducing costs and providing the opportunity to enhance sales.

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### **5.3 Local Effects of Systemic Issues**

Shrinkage may be seen as a series of local problems or as a systematic issue whose effects manifest themselves as a result of a series of disparate factors coming together. Viewed in isolation, shrinkage incidents appear unconnected from one another and the response is to deal with them locally as and when they occur. Take for example the response when a case of bottles is dropped in the back of store. The local view of shrinkage results in the employee who dropped the case being reprimanded and the broken items cleared away.

Viewed from a systemic perspective, this same incident is seen as being the consequence of several factors that combined in a critical way at the time of the incident. For example, the case of bottles was half full and unstable; The employee was in a hurry as they had been called away from shelf replenishment to serve on the busy checkouts; When the case of bottles was dropped, the employee was holding the case in one hand while using the other hand to make space on an already full warehouse shelf. None of these factors were individually critical but they conspired in a way that led to the incident. Therefore in order to understand shrinkage, the systemic perspective takes a broad view of events that considers issues relating to corporate policy that includes: product design; replenishment quantity and frequency; facility layout; recruitment, and; staff discipline.

The perspective of shrinkage as a systemic issue recognises that there can be significant distance and time-lag between where and when the causes of shrinkage occurred and where and when their effects materialise. Therefore in order to understand and manage shrinkage it is necessary to look across a business and the life cycle of the elements to be found there. The life cycle of the various elements to a retail business can be broken into three horizons of long-term, medium-term and short-term. Long terms issues are those that are strategic in nature, typically designed in the infrastructure and are very difficult to change, such as the location and shape of a building. In the medium term there are some significant decisions that that are made within the constraints set down by design or strategy. Short term issues are tactical in nature and relate to the day-to-day running of operations. The table below brings together the key elements of a retailing business that influence shrinkage and presents some of the key activities that occur within each of the three time horizons.

		Temporal Stages		
		Long-term	Medium-term	Short-term
Places	Store	<ul style="list-style-type: none"> <li>Plan location.</li> <li>Develop layout.</li> </ul>	<ul style="list-style-type: none"> <li>Introduce new processes and practices.</li> </ul>	<ul style="list-style-type: none"> <li>Process and practice adherence.</li> <li>Incident management.</li> </ul>
	Supply chain	<ul style="list-style-type: none"> <li>Supply chain network design.</li> <li>Distribution centre design.</li> </ul>	<ul style="list-style-type: none"> <li>Supplier selection.</li> <li>Introduce new processes and practices.</li> </ul>	<ul style="list-style-type: none"> <li>Process and practice adherence.</li> <li>Incident management.</li> </ul>
Infrastructure	Product	<ul style="list-style-type: none"> <li>Product design.</li> <li>Packaging design.</li> </ul>	<ul style="list-style-type: none"> <li>Purchasing.</li> </ul>	<ul style="list-style-type: none"> <li>Flow of product from raw material to sale at checkout.</li> <li>Returns.</li> <li>Incident management.</li> </ul>
	People	<ul style="list-style-type: none"> <li>Create human resource policies.</li> </ul>	<ul style="list-style-type: none"> <li>Recruitment.</li> <li>Training.</li> </ul>	<ul style="list-style-type: none"> <li>Audit.</li> <li>Accountability.</li> <li>Action.</li> <li>Attitude.</li> </ul>
	ICT systems	<ul style="list-style-type: none"> <li>System design.</li> </ul>	<ul style="list-style-type: none"> <li>Supplier selection.</li> <li>New system implementation.</li> <li>System upgrade.</li> </ul>	<ul style="list-style-type: none"> <li>Process and practice adherence.</li> <li>Incident management.</li> </ul>

**Table 3. A List of Key Issues that Influence Shrinkage**

This table provides a framework for introducing a systemic perspective on shrinkage management. Instead of seeking to attribute the cause of an incident to one element of the table, the aim is to consider the role of each aspect of the business in contributing to this issue. This means that when it comes to addressing issues, the right parts of the business can be targeted at the right time.

A summary of the strengths and weaknesses of the local and systemic perspectives is shown in the table below.

	Strengths	Weaknesses
Local	<ul style="list-style-type: none"> <li>Simple.</li> <li>To the point.</li> <li>Quick.</li> <li>Respond to events as they occur.</li> </ul>	<ul style="list-style-type: none"> <li>Simplistic.</li> <li>Uninformed.</li> <li>Reactive.</li> <li>Address only symptoms, not causes.</li> </ul>
Systemic	<ul style="list-style-type: none"> <li>Identify causes.</li> <li>Prevent future incidents.</li> <li>Facilitates collaboration around a common problem.</li> </ul>	<ul style="list-style-type: none"> <li>Requires multifunctional support to implement.</li> <li>Requires collaboration.</li> <li>Less responsive.</li> </ul>

**Table 4. Strengths and Weaknesses of the Isolation and Systematic Perspectives of Shrinkage**

These two perspectives are not mutually exclusive, so the management challenge is to think about shrinkage in its broadest sense whilst delivering focussed action at the right parts of the business. Measurement will be vital in rising to this challenge.

Looking across the business there is a need to gather data on the performance of those activities that have an impact on shrinkage and this information needs to be brought together so it can be considered in its totality. Taking the stores as an example, the measurement systems would assess long term issues linked to store design, medium term issues like the design of store procedures and short term issues like how these procedures are being followed. The role of this measurement system is to report results, such as the on the use of good practice, track trends over time and direct resources to where they will be most effective. The likelihood is that these resources will be managed at a local level, e.g. in-store, so the information needs to be specific and advice on what actions to take needs to be specific and relevant to that operation. In summary, the big issues need to be decomposed into little issues and acted on straight away.

## 5.4 The Detailed Nature of Retailing

The popular retailing adage that, ‘retail is detail’ resonates particularly well when it comes to shrinkage measurement. Shrinkage skews towards particular products; locations; processes; people; and times<sup>3</sup> so in order to identify where shrinkage is concentrated, data is required. This data comes at a price, i.e. the cost in gathering, analysis and dissemination. Therefore a trade off exists between the benefit that data can bring and its associated costs.

	Strengths	Weaknesses
Detailed Shrinkage Data	<ul style="list-style-type: none"> <li>• Provides a rich description of shrinkage.</li> <li>• Reveals concentrations of loss.</li> <li>• Allows management effort to be focussed on to priority areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher effort required to collect, process and analyse data.</li> <li>• Data needs to be processed to be informative.</li> <li>• Cannot uncover everything.</li> </ul>

**Table 5. The Strengths and Weaknesses of Detailed Shrinkage Data**

On balance, the strengths of collecting and deploying detailed data on shrinkage appear compelling. There is cost associated with implementing the systems required to gather and process the data however the insight this data provides into the nature and location of shrinkage provides the only sound basis for management action.

<sup>3</sup> See Beck, A. and Chapman, P. (2003) *Hot Spots in the Supply Chain*, ECR Europe, Brussels.

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## **5.5 Summary of Perspectives on Shrinkage**

In summary, this review of the alternative perspectives on shrinkage finds a case for treating it as a systemic issue that needs to encompass the whole supply chain from raw material to checkout sale to return. In terms of measuring shrinkage, the review points towards the measurement of additional costs and foregone sales to reflect the cost burden of shrinkage as well as the lost profit opportunity that incremental sales could bring. In order to guide management action, data needs to be available at the lowest level of granularity, by:

- Product.
- Location.
- Time.

For example, good practice already exists where companies have shrinkage data available by stock keeping unit, SKU, (also known as the 'reference') by store by week.

Summarising the debate presented above, shrinkage measurement should:

- Be capable of capturing the systemic nature of shrinkage.
- Capture data in a way that allows it to be aggregated and disaggregated without losing its integrity.
- Follow an approach that would allow alternative costing practices to be applied where necessary.

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## 6 Methods for Measuring Shrinkage

In order to propose a method for measuring shrinkage the following issues need to be considered:

- Components of shrinkage.
- Representing the shrinkage metric.
- Valuing shrinkage.

These issues are discussed below.

### 6.1 Components of Shrinkage

Shrinkage is often categorised in terms of being 'known' or 'unknown'. Known shrinkage is the loss that has been identified, recorded and processed whilst unknown shrinkage is the shrinkage discovered following reconciliation between the result of a physical stock-take and the company's book stock. The nature and causes of unknown shrinkage are not identifiable, hence its name. That said, the nature and causes are typically considered as comprising of the following four categories:

- Process failures.
- Internal theft.
- External theft.
- Inter-company fraud.

Known shrinkage is possible to divide into sub-categories, which include:

- Known theft processed.
- Known errors processed, such as out-of-date or damages.
- Cost of sales adjustments, such as tasting, mark downs or out-of-date.
- Other, such as donations.

The particular classification used by a company needs to reflect the priorities identified by the management team.

It is acknowledged that there are a variety of sources of shrinkage data that can be used to provide data on the categories listed above. These data sources include:

- Store detective data.
- The police.
- Daily stock checks/one off or short term counting procedures.
- CCTV data.
- Electronic article surveillance data.
- Till discrepancy data.
- Mystery shoppers.
- Collecting of disposed packaging or broken EAS tags.

All of these data sources have their advantages and disadvantages but each will add rich inputs to a well constructed shrinkage management programme. However a detailed review of the merits of these data sources is outside the scope of this research, which focuses on the measurement of lost stock.

## 6.2 Valuing Shrinkage

Stock can be classified into a number of different types:

- Goods or other assets purchased for resale.
- Consumable stores, e.g. carrier bags.
- Raw materials and components, e.g. a joint of ham to be carved in the delicatessen.
- Work in progress, e.g. partly baked bread.
- Finished goods.

The stock valuation calculation will need to be different at each stage of operation to reflect these different classifications. This calculation also needs to be consistent with the regulatory instruments, such as the Statement of Standard Accounting Practice and International Accounting Standards. Examples of stock valuation are shown below in Table 6.

Stock Type	Method of Valuation
Raw Materials	Purchase price but are reduced to net replacement cost if lower.
Work In Progress	Valued at the cost of materials plus manufacturing labour and overheads.
Finished Goods	Valued at the lower of purchase price, manufacturing cost and net realisable value.

**Table 6. Examples of Stock Valuations. (Source: Chopping and Stephens)**

Accounting practices therefore point towards using different methods of valuation of goods depending on their status. The merits of this for financial reporting are undisputable however it appears that in practice few retailers are able to do this when measuring shrinkage. This would require constantly updated information on each batch of goods concerning their purchase price; their status in the supply chain, i.e. to determine what costs had been incurred during work in progress and whether they had become finished goods; and a view on the saleability of the goods to determine their net realisable value. Instead retailers tend to opt for a more simple method of valuation, such as:

- Sales value.
- Purchase price.
- Transfer cost.

Each of these methods of valuation possesses strengths and weaknesses, which are summarised in Table 7 below.



Method of Valuation & Definition	Strengths	Weaknesses
Sales value. <i>The sales price of the good</i>	<ul style="list-style-type: none"> <li>• Presents a big number that grabs attention.</li> <li>• Factors in the margin.</li> <li>• Easiest valuation to find.</li> </ul>	<ul style="list-style-type: none"> <li>• Margin is not always fully understood (e.g. purchasing margin versus sales margin).</li> </ul>
Purchase price <i>The price that the good was purchased for</i>	<ul style="list-style-type: none"> <li>• Most compatible measure with balance sheet &amp; tax dept. calculations.</li> <li>• Prudent (accounting) approach.</li> </ul>	<ul style="list-style-type: none"> <li>• Fails to accommodate overhead apportioning.</li> <li>• Need to know the margin if working back from sales price.</li> </ul>
Transfer cost <i>Purchase price plus apportioned costs</i>	<ul style="list-style-type: none"> <li>• The valuation of all costs incurred.</li> <li>• Useful when dealing with retail brands.</li> </ul>	<ul style="list-style-type: none"> <li>• Most difficult to calculate.</li> </ul>

**Table 7. Strengths and Weaknesses of Alternative Methods of Shrinkage Valuation**

Given that each of these methods have their merits it is not feasible to promote one over the others. Instead it is more appropriate to acknowledge that each has its uses and retailers should consider using more than one method of valuation. However this raises the possibility that data based on different valuations could mix which may create more problems than the benefit accrued. This problem would be overcome if the cost components associated with goods were available. Valuation and also conversion between different methods of valuation could then be achieved by including or excluding particular cost components.

A review of the methods of stock valuation reported in the accounts of selected retailers that support ECR Europe illustrates the point that there is no dominant method for valuing stock and in specific situations a company will employ more than one method of inventory valuation e.g. Wal\*Mart. This review is summarised below in Table 8 with the appropriate sections taken from the company reports listed in Appendix 2. In Table 8 the various companies inventory valuation policy is categorised against the menu of methods listed in the column headings. Definitions for the inventory valuation methods used in Table 8 are provided in Appendix 3.

Company	Inventory Valuation Method						
	Retail Method	Retail Price	Purchase Price	First In First Out (FIFO)	AVCO	AVCO /FIFO	AVCO LIFO
Ahold (2003)				✓			
Auchan (2003)			✓	✓			
Carrefour (2004)			✓				
Focus Wickes (2002)			✓				
Marks & Spencer (2004)	✓						
Metro (2003)					✓		
Sainsbury (2004)				✓		✓	
Sonae (2003)					✓		
Tesco (2004)		✓					
Wal*Mart (2004) Domestic	✓ (LIFO)						
Wal*Mart Foreign Operations	✓ (FIFO)						
Sam's Club							✓

Table 8. Inventory Valuation Policy. (Source: Company's Report and Accounts (year in brackets))

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## 6.3 Representing the Shrinkage Metric

Having collected and collated data on shrinkage, the resulting metric is generally presented as either an absolute figure or it is put in to context against other business metrics.

Presenting shrinkage as an absolute figure reveals the financial value of the losses incurred. A common way of giving context to the amount of shrinkage is to present it as a percentage of some other metric, such as turnover or profit. This method normalises the amount of shrinkage against another parameter and removes some of the sensitivity exhibited by many firms to revealing their financial results.

Typical methods of contextualising shrinkage include:

- Shrinkage as a percentage of turnover.
- Shrinkage as a percentage of profit.
- Other ways to bring shrinkage to life.

These methods are discussed below.

### 6.3.1 Shrinkage as a Percentage of Turnover

Shrinkage as a percentage of turnover is the standard benchmark quoted by firms and is seen as a way to determine relative performance. Although this is a simple measure it is possible to arrive at it from a number of directions, all of which have their merits. In order to compare different metrics it is necessary to be aware of the method of calculation and use the one chosen in a consistent manner.

At the heart of this measure of shrinkage is the formula:  $\left( \frac{\textit{shrinkage}}{\textit{turnover}} \right) 100\%$

This calculation is influenced by the way that either the numerator (shrinkage) or denominator (turnover) are valued.

#### Valuing Turnover

In order to calculate shrinkage as a percentage of turnover it is necessary to value turnover. This can be presented as either Gross, i.e. the sum of the value of all income from customers or Net, which deducts sales tax. The strengths and weaknesses of using these two valuations of turnover are presented in the Table 9 below.

Method of Valuation	Strengths	Weaknesses
Gross	<ul style="list-style-type: none"> <li>• Most simple figure to collect, i.e. the price the shopper paid.</li> </ul>	<ul style="list-style-type: none"> <li>• Different sales taxes between countries will affect the gross amount and make inter-country comparison less consistent.</li> </ul>
Net	<ul style="list-style-type: none"> <li>• This is the smaller of the two amounts, resulting in shrinkage being presented as a larger figure.</li> <li>• Sales tax is not the company's money – it's the government's, so should be removed so not to bias company thinking.</li> <li>• Removing the different sales taxes levied by countries improves inter-country comparison.</li> </ul>	<ul style="list-style-type: none"> <li>• Deducting the sales tax complicates the calculation.</li> </ul>

**Table 9. Strengths and Weaknesses of Methods of Valuing Turnover**

The effect of using either net or gross turnover to calculate the 'shrinkage as a percentage of turnover' metric makes a significant difference to the resulting number. However the decision on which figure to choose is relatively arbitrary and once it is clear which method is being used it is easy to convert between them.

### 6.3.2 Shrinkage as a Percentage of Profit

When valued at cost, shrinkage is a component of overall business costs. In its simplest form these costs are subtracted from income to calculate profit. Therefore a change in the amount of shrinkage will result in an inversely proportional change in profit. In order to illustrate the link between shrinkage and profit, shrinkage can be presented as a percentage of profit.

$$\text{Shrinkage as a percentage of profit} = \left( \frac{\text{shrinkage}}{\text{profit}} \right) \times 100\%$$

This relationship can be demonstrated using average levels of shrinkage and profits for European grocers. Assuming average shrinkage, as a percentage of a retailer's turnover is 1.8% and average profit, as a percentage of turnover is 3%, shrinkage as a percentage of profit is  $\left( \frac{1.8\%}{3\%} \right) \times 100\% = 60\%$

The merit of this way of presenting shrinkage is to highlight that shrinkage reduction presents an opportunity for the average European grocer to increase their profits by 60%.

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### **6.3.3 Others Ways to Bring Shrinkage to Life**

Shrinkage can be contextualised through comparison against a host of other financial and non-financial metrics. The aim of these comparisons is to offer an illustration of the scale or relative importance of shrinkage.

An example of a non-financial comparison is to calculate the number of additional stores required to generate the same incremental profit achieved through reducing shrinkage. Taking European average figures, a 50% reduction in shrinkage would return the same amount of additional profit as a 30% increase in the number of stores operated by a retailer. Therefore a 50% reduction in shrinkage by a retailer operating 500 stores would deliver the same profit increase as opening 150 new stores. This sort of calculation can help portray the strategic importance of shrinkage and justify senior management attention.

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## 7 Survey of Shrinkage Measurement Practices

Given the range of alternative approaches and methods to measuring shrinkage, a survey was undertaken to establish a view of the current practices employed by European retailers.

### 7.1 Survey Aims

This survey of shrinkage measurement practices aimed to establish the:

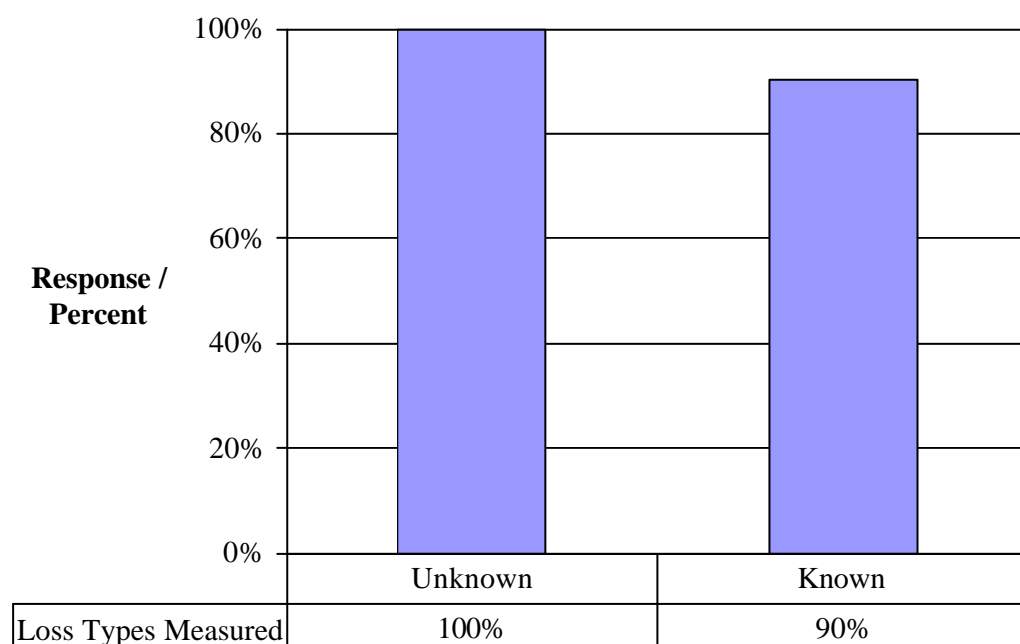
- Extent to which data on know loss and unknown loss is gathered.
- Store related issues included in the shrinkage measure.
- Supply chain issues that are measured.
- Extent to which retail sales value, cost price or transfer cost are used to value shrinkage.
- Resolution to which shrinkage data is captured.
- Frequency with which shrinkage data is gathered.

The research instrument used in this survey is presented in Appendix 1. ‘Measuring Shrinkage’ Survey Questions.

The findings from the survey are presented below.

### 7.2 The Extent to Which Know Loss and Unknown Loss are Included in the Calculation of Shrinkage.

All companies that responded to the survey included unknown loss in their calculation of shrinkage. Ninety percent of respondents also included known loss in their calculation of shrinkage. These findings are illustrated in Figure 1 below.



**Figure 1. The Extent to Which Know Loss and Unknown Loss are Included in the Calculation of Shrinkage**

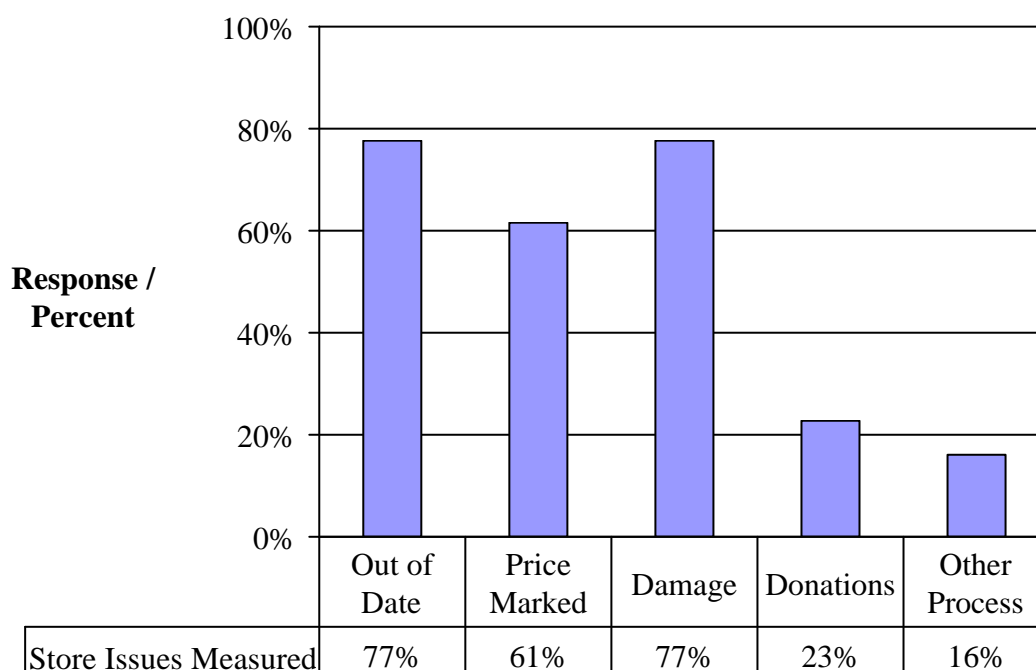
These findings indicate that most companies consider shrinkage to consist of both known and unknown losses. However not all companies include known loss in their calculation. Those companies that do not include known loss in their calculation of shrinkage appear to define shrinkage as being those losses that can not be attributed to a known cause.

### **7.3 Store Related Issues Included in the Shrinkage Measure**

Known loss can be categorised under a number of headings. The more common causes of known loss recorded at stores are:

- Out of date, where the shelf life of a good has been reached and it cannot be sold.
- Damage, where a good has been damaged and cannot be sold.
- Price marked downs, where the price of a good has been reduced, e.g. because the good is nearing the end of its sales life or has been damaged.
- Donations, where a good has been donated freely and not sold.

The survey sought to establish which of these categories were normally included by the retailer when calculating their rate of stock loss. The findings from the survey are presented below in Figure 2.

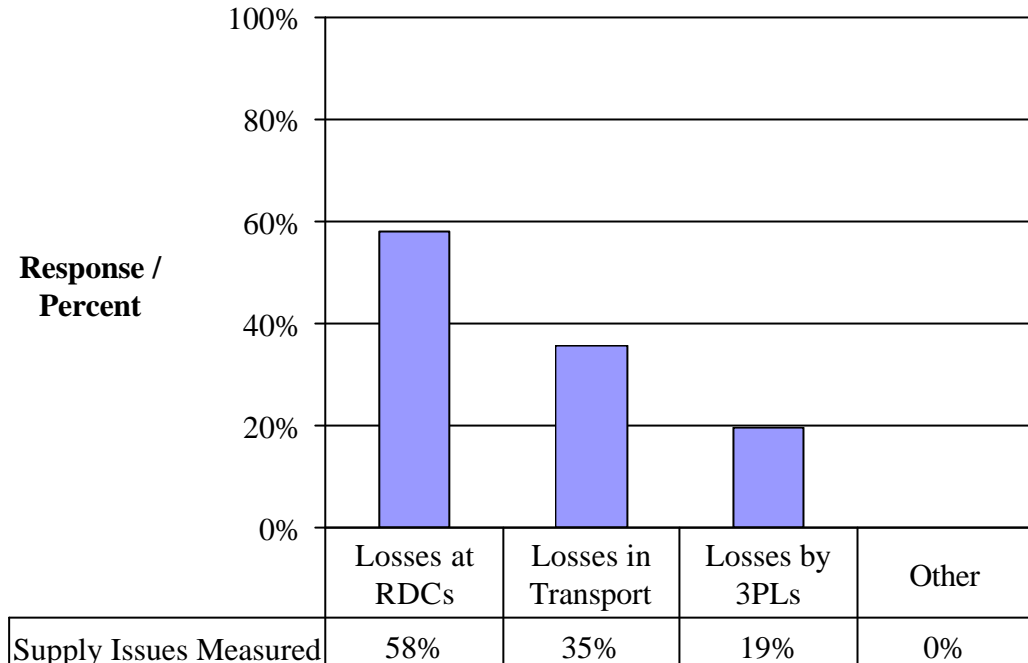


**Figure 2. Store Related Issues Included in the Shrinkage Measure**

The findings from the survey show that most retailers include out of date, price mark downs and damage in their calculation of shrinkage. A small number of companies include donations. This may be that not all companies allow goods to be donated. Equally it may be the case that those companies that do allow donations do not view them as a form of shrinkage. Several companies reported that they employ other categories under which they classify their loss.

## 7.4 Supply Chain Issues Included in the Shrinkage Measure

Shrinkage can occur in a retailer's supply chain as well as in stores. In order to understand whether this was measured, retailers were asked whether they recorded shrinkage in their supply chain.



**Figure 3. Supply Chain Issues Included in the Shrinkage Measure**

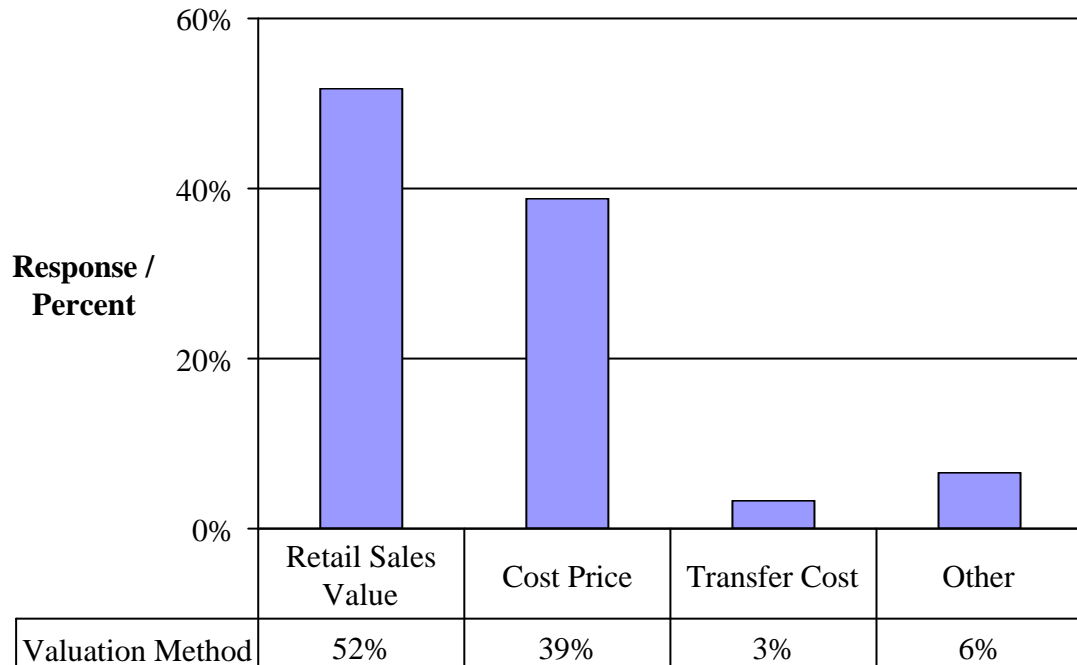
The findings from the survey are shown above in Figure 3. These results show that more than a half of retailers include losses in their regional distribution centres in their calculation of shrinkage. Slightly more than a third includes losses in transport, i.e. between distribution centres or between a distribution centre and the stores. Fewer still included losses by third party logistics service providers in their calculation of shrinkage.

Not all retailers in the survey operate a distribution network, using instead direct distribution to store by suppliers. However these companies are the exception and do not make a notable impact to the results shown above. Instead, the results point to retailers failing to consider losses that undoubtedly occur in their supply chain.



## 7.5 The Extent to Which Retail Sales Value, Cost Price or Transfer Cost are Used to Value Shrinkage

The discussion presented earlier described the various ways in which shrinkage can be valued. The survey sought to identify which of these methods are used in practice. The results of the survey are shown below in Figure 4.



**Figure 4. The Extent to Which Retail Sales Value, Cost Price or Transfer Cost are Used to Value Shrinkage**

The findings from the survey show that whilst the most common method of shrinkage valuation was the 'retail sales value' method (52%), there is not a dominant method of shrinkage valuation amongst European grocery retailers. Instead there is widespread use of both retail sales value and cost price as the preferred method of valuation. The one method that receives little support is the transfer cost method.

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## 7.6 The Resolution to Which Shrinkage Data is Captured

The resolution to which shrinkage data is captured was examined. This considered the capture of data for both locations and products.

### 7.6.1 Location Data Resolution

Data on shrinkage can be captured according to the location where it was discovered. Retailers could therefore record location shrinkage for each of their stores. Alternatively they may capture this data for the company as a whole.

### 7.6.2 Product Data Resolution

Data on product loss can be captured at various levels of detail. The highest detail is at the level of individual stock keeping units (known as 'references' in many countries). Where SKU data is not recorded, losses may be recorded for a category. Categories typically consist of between two hundred and a thousand related products. The lowest level of detail is to collate all loss data together into a single, company wide shrinkage figure.

The findings from the survey of shrinkage data resolution are presented below in Figure 5

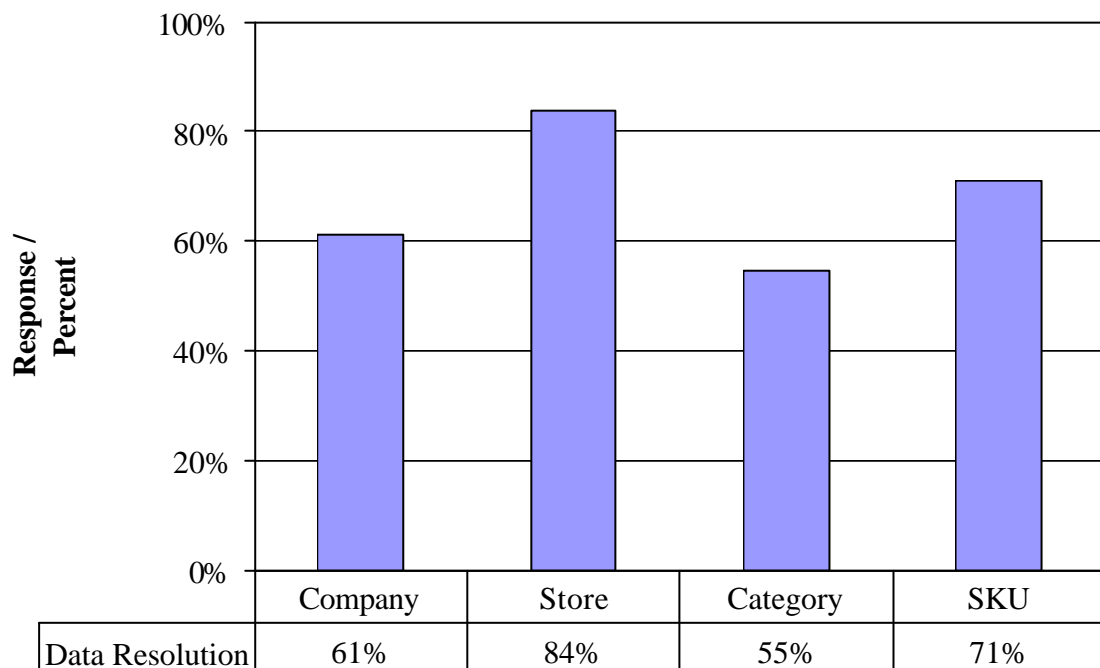


Figure 5. The Resolution to Which Shrinkage Data is Captured

Companies could report multiple levels of data capture, hence the results do not add up to one hundred percent. With regard to location, companies tended to record their shrinkage at the store level although not all companies did this. Most companies compiled shrinkage for the company as a whole although this was less than the number that reported collating it by store. This shows that not all companies who collect shrinkage data by store compile this data at the company level.

The resolution of data on shrinkage by product shows that most companies have data by SKU, although not all. Two companies that did not collect data by SKU collected their data by category. The remainder collected data at a global level.

### 7.7 Frequency of Stock Audits

The frequency with which retailers undertake stock audits was surveyed. Stock audits are a popular mechanism for collecting data and companies have several options on how often to undertake them. Stock audits tend to be undertaken to determine the assets of the company for financial reporting reasons on an annual or bi-annual basis. The amount of goods found to be held by the company can be compared against the company’s records, with discrepancies noted. Inventory counting can take place at times other than the stock audit for financial reporting reasons. These instances tend to occur to provide information for stock control. Measurement for stock control seems to occur monthly or less. Given the erratic number of days in months this converts into periods of four or five weeks. The survey sought to establish the frequency with which shrinkage data is gathered in terms of these three time periods of annually, bi-annually and less than five weeks.

A second time related issue explored in the survey was to establish whether retailers audit shrinkage when a store manager leaves. The rationale being that a manager may influence the results of a stock audit, leaving behind a shrinkage issue that could not be attributed to them when it comes to light at a subsequent stock audit.

The findings from the survey on the frequency with which shrinkage data is gathered are presented below in Figure 6.

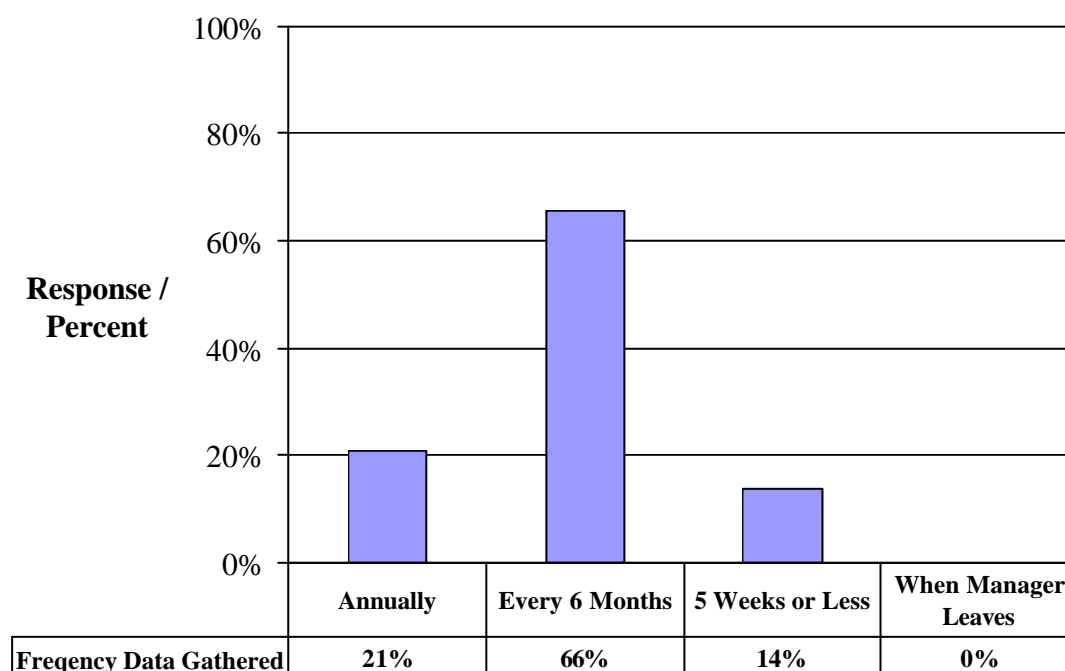


Figure 6. Frequency of Stock Audits.

The survey found that most organisations collect their shrinkage data biannually with most of the remained collecting it annually. Less than fourteen percent of respondents gather data every five weeks or less. No companies reported collecting data when a manager leaves a store.

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## **8 Discussion of Findings**

The survey of shrinkage measurement provides useful insight in to the methods and practices used by European grocery retailers. The overall picture painted by the survey findings is that there are pockets of good practice in shrinkage measurement however only a few companies possess a system of measurement capable of effectively focussing management attention and informing decision making.

### ***8.1 Stewardship versus performance improvement.***

The numbers of retailers that use retail sales value or cost price to value shrinkage are roughly comparable. Both approaches have their merits and issues so the choice of method should depend on company objectives. Caution needs to apply when comparing between levels of shrinkage that have been valued differently. Companies should therefore declare their valuation method when reporting their results.

In light of accounting discrepancies in industry in general, e.g. at Enron, and in grocery retailing in particular, e.g. at Ahold, stewardship cannot be sidelined. However effective management of shrinkage presents the opportunity to dramatically improve financial performance and this opportunity needs to be aggressively pursued. This points to the need for both methods for valuing shrinkage to be employed. The challenge for management will be to use these methods in harmony, recognising when they should and should not be used and to maintain consistency that allows data to be converted between formats without degradation.

### ***8.2 Systemic Nature of Shrinkage***

Encouragingly, data is generally gathered on both known and unknown shrinkage. This demonstrates that retailers are aware of which issues to consider when it comes to measuring shrinkage in their stores, although some gaps remain in the consistency with which the range of known losses are reported. Less promising is the low level of data collection in the supply chain. There is a strong indication that when losses in the supply chain are not identified they instead become attributed to stores. Consequentially the poor level of data collection in the supply chain will over-emphasise the issue in stores and underplay the scale of shrinkage in the supply chain.

The uneven balance in measurement between stores and the supply chain indicates that stores are the main focus for shrinkage management, with the critical role of effective supply chain operations overlooked. This suggests that retailers do not view shrinkage in systemic terms and continue to treat it in a simplistic, isolated manner. Evidence to support this supposition is that despite the focus on shrinkage in stores, retailers are generally limited in their ability to collate detailed data by store and by SKU level or to be able to aggregate this data up for the company as a whole.

A systemic approach requires the ability to gather data at the lowest level and collate it at a macro level for analysis. The results from the survey suggest that retailers are strongest at collecting data at the micro level but the problem is that they are not converting it into macro level data.

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Where micro level data is collated to the macro level, this would allow the investigation of phenomena such as Hot Stores and Hot Products. The ability to navigate between top level data and the underlying detail provides the capability to identify at the top-level where concentrations of shrinkage lie and then to drill in to those key areas of loss in detail using data mining techniques. This capability was not found to be widespread amongst the survey respondents.

### ***8.3 Detailed Nature of Retailing***

A key finding from prior research is the importance of being able to focus attention on Hot Products and Hot Stores. Without the ability to gather data of shrinkage by SKU and by store, retailers cannot focus efforts on to their key areas of loss. Equally, detailed data needs to be accessible so it can be aggregated from SKU and store and analysed at the company level.

Data should be collected on a regular basis to allow decisions to be made on emerging trends and to track the effect of shrinkage management efforts. Good practice is to increase the frequency that data is gathered. The majority of companies reported that they collect data at six-month intervals. Several companies demonstrate that it is possible to collect data monthly. These frequent updates on performance are likely to reinforce efforts to drive improvements and to keep abreast of developments.

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## 9 Conclusions

Shrinkage affects shoppers in a number of ways including reduced on-shelf availability, reduced assortment and defensive merchandising. None of these provide shopper satisfaction, hence sales are depressed and profits foregone. In addition to lost sales, shrinkage also affects profits through associated additional cost.

The scale of the impact on shoppers and on profit is sufficient to warrant senior management attention and investment in gathering the data necessary to guide management decisions. Shrinkage measurement should provide access to data that is collected:

- By product and location.
- Frequently, robustly and consistently.
- Across the supply chain, in stores (sales floor and back of store), transportation and distribution centres.

In practice this will require a measurement system that consists of two parts:

1. A database containing a breakdown of the cost components of each SKU.
2. Data on shrinkage by SKU; by location (e.g. store or distribution centre); by month.

When brought together, these two data sources provide a valuable input to management that informs them on the overall scale of shrinkage and both cost and lost profit implications. This data will enable them to determine where and when losses occur, allowing resources to be deployed to diagnose, address and resolve key issues.

It is acknowledged that data should be reported to different people in different ways. For example it seems likely that store managers need different information than buyers and the same will be true for other key stakeholders such as regional security managers, Board members, the media and shareholders. It is therefore the case that having the capability to measure shrinkage is only one component of the overall challenge of reducing shrinkage. There remains the challenge of being able to make good use of these measures through data analysis (e.g. data mining) and through dissemination of key summaries to the various stakeholders required to direct and undertake concerted action.

## Appendix 1. 'Measuring Shrinkage' Survey Questions

The 'Measuring Shrinkage' survey was one section in a wider four section survey on shrinkage. The questions used in the 'Measuring Shrinkage' section of the survey are presented below.

<b>When calculating your rate of stock loss, how do you value the cost of lost stock? (please tick only one option)</b>	Retail sales value..... <input type="checkbox"/> Cost price..... <input type="checkbox"/> Cost price plus an additional cost (transfer cost method)..... <input type="checkbox"/> Other (please specify)..... <input type="checkbox"/> .....	<i>This question is interested in how you normally calculate the value of lost stock within your company for losses incurred throughout the company.</i>
<b>What do you include in your stock loss figure (please tick all those that apply)?</b>	Unknown losses..... <input type="checkbox"/> Known losses..... <input type="checkbox"/> Recorded process failures: Out of date stock..... <input type="checkbox"/> Price mark down..... <input type="checkbox"/> Damage ..... <input type="checkbox"/> Donations..... <input type="checkbox"/> Other ..... <input type="checkbox"/> Losses at your RDCs..... <input type="checkbox"/> Losses in transport from RDCs to stores..... <input type="checkbox"/> Losses by a third party logistics supplier..... <input type="checkbox"/> Other, please specify..... <input type="checkbox"/> ..... .....	<i>We are interested in knowing what you normally include when you calculate your rate of stock loss. Please tick all those options that apply.</i>
<b>At what level are you able to measure stock loss (please tick all those that apply)?</b>	Company wide only ..... <input type="checkbox"/> By individual store..... <input type="checkbox"/> Category level only ..... <input type="checkbox"/> By individual reference/ SKU ..... <input type="checkbox"/>	<i>We are interested in knowing at what level of detail you are able to calculate levels of stock loss – this should not be theoretical, but based upon normal company practices and procedures. In other words, the data is collected routinely and held centrally by the company.</i>
<b>How often do you carry out a physical audit of the stock in your stores?</b>	Annually only ..... <input type="checkbox"/> Every 6 months..... <input type="checkbox"/> Every 5 weeks or less ..... <input type="checkbox"/> When a store manager leaves..... <input type="checkbox"/>	<i>This question relates to the majority of the stock within the store and not just specialist lines.</i>

## Appendix 2. Selected Retail Inventory Policies

Company & Source	Inventory Policy
Ahold Annual Report 2003	Inventory is stated at the lower of cost or net realizable value. Cost comprises all costs of purchase, cost of conversion and other costs incurred in bringing the inventories to their present location and condition, net of vendor allowances applicable to inventory. The cost of inventories is determined using the first-in, first-out (FIFO) method.
Auchan Financial Report 2003	<p>Inventories are stated net of year-end discounts at the latest purchase price apply a method comparable with the FIFO (“First In First Out”) method in the case of inventory with rapid turnover, or at weighted average unit cost or at selling price less profit margin. Inventories are written down if their probable realisable value is below cost.</p> <p>Given the interchangeable nature of merchandise, it is not possible to determine the portion of goods in inventories that is subject to vendor liens at the year-end.</p>
Carrefour Annual Report 2004	Inventories of merchandise are valued at the last purchase price plus any related costs, a method suitable for rapid inventory turnover. This price includes all the conditions obtained at purchase. They are adjusted to market value at year end if necessary.
Focus Wickes Limited Annual Report 2002	<p>Stocks are stated at the lower of cost and net realisable value. Cost comprises the purchase cost of goods and where appropriate cost related to storage and distribution.</p> <p>Volume-related rebates receivable from supplies are deducted from the carrying value of stock. Rebate agreements with suppliers that cover more than one year are recognised in the accounts in the period in which they are earned.</p>
Marks and Spencer plc Annual Report 2004	Stocks are valued at the lower of cost and net realisable value using the retail method. All stocks are finished goods.
Metro AG Annual Report 2003	<p>Merchandise recognized as inventories is reported at cost. As a rule, the cost is determined by means of the weighted average cost formula. Merchandise is measured as per balance sheet date at the lower of cost or net realizable value.</p> <p>Merchandise is written down on a case-by-case if the anticipated net realizable value declines below the carrying amount of the inventories. Such net realizable value corresponds to the anticipated estimated selling price less the estimated costs necessary to make the sale. When the reasons for a write-down of the merchandise have ceased to exist, the write-down is reversed.</p>



J Sainsbury plc Annual Report and Financial Statements 2004	Stocks are valued at the lower of cost and net realisable value. Stocks at warehouses are valued on a first in first out basis. Those at retail outlets are valued at calculated average cost prices.
Sonae SGPS, S.A. Report and Consolidated Accounts 2003	Stocks are stated at the lower of cost and net realisable value. In general, cost is determined on a moving average basis using the following methods: <ol style="list-style-type: none"> <li>1. Raw materials and goods for resale <ul style="list-style-type: none"> <li>• Purchase cost including transport and handling</li> </ul> </li> <li>2. Work in progress and finished goods <ul style="list-style-type: none"> <li>• All costs relating to work in progress</li> <li>• All direct expenditures and an allocation of production overheads based on normal levels of activity</li> </ul> </li> <li>3. Goods for resale <ul style="list-style-type: none"> <li>• Average purchase cost.</li> </ul> </li> </ol>
Tesco PLC Annual Report 2004	Stocks comprise goods held for resale and properties held for, or in the course of development and are valued at the lower of cost and net realisable value. Stocks in stores are calculated at retail prices and are reduced by appropriate margins to take into account factors such as obsolescence, seasonality and damage.
Wal-Mart Annual Report 2004	<p>The company values inventories at the lower of cost or market as determined primarily by the retail method of accounting, using the last-in, first-out (LIFO) method for substantially all domestic merchandise inventories, except SAM'S CLUB merchandise, which is based on average cost using LIFO method Inventories of foreign operations are primarily valued by the retail method of accounting, using the first in, first out (FIFO) method. Our inventories at FIFO did not exceed inventories at LIFO by a significant amount.</p> <p>Wal-Mart receives money from suppliers for various programs, primarily volume incentives; warehouse allowances; and reimbursements for specific programs such as markdowns, margin protection and advertising. Substantially all allowances are accounted for as a reduction of purchases and recognized in our Consolidated Statements of Income when related inventory is sold.</p>

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## Appendix 3. Definitions of Inventory Valuation Methods

<b>Average Cost (AVCO)</b>	<p>A method of unit cost determination, often applied to stocks. An average unit cost is calculated when a new purchase quantity is received by dividing the sum of the cost of the opening stock plus the cost of the acquisitions by the total number of units in stock.</p> <p><b>CIMA Management Accounting Official Terminology 2000 Edition</b></p>
<b>First In, First Out (FIFO)</b>	<p>The principle that the oldest items or costs are the first to be used. Most commonly applied to the pricing of issues of materials, based on using first the costs of the oldest materials in stock, <i>irrespective of the sequence in which actual material usage takes place</i>. Closing stock is therefore generally valued at relatively current costs.</p> <p><b>CIMA Management Accounting Official Terminology 2000 Edition</b></p>
<b>Last In, First Out (LIFO)</b>	<p>A little-used method of pricing the issue of material using the purchase price of the latest unit in stock. More often used, in the USA, a method of valuing stock using indices to charge most recent prices against profits.</p> <p><b>CIMA Management Accounting Official Terminology 2000 Edition</b></p>
<b>Retail Method</b>	<p>An inventory valuation method designed to allow a retailer to take physical inventory at retail selling prices and then deduct an amount determined to reflect gross profit.</p> <p><a href="http://www.irs.gov/businesses/page/0..id%3D6988_00.html">http://www.irs.gov/businesses/page/0..id%3D6988_00.html</a> Accessed 20<sup>th</sup> October 2004</p>

