



**RETAIL INDUSTRY  
LEADERS ASSOCIATION**



# **Understanding and Controlling the Risk of Self-checkout Technologies**

**Learn • Engage • Contribute • Challenge**

# The Agenda for This Afternoon

- **Introductions and Expectations**
- **SCO Benchmarking Exercise**
- **SCO Technology Showcase**
- **Speed Dating**
- **Networking Reception**

**Learn • Engage • Contribute •**

# YOUR EXPECTATIONS



# Benchmarking Exercise

Download the App:  **VOXvote**

Vote on [live.voxvote.com](https://live.voxvote.com)

**PIN: 41925**

# **Technology Showcase**

# Speed Dating

- **What it's not... is time for cheesy chat-up lines...**
  - Are you a magician? Because whenever I look at you everyone else disappears!
  - Are you religious? Because you are the answer to all my prayers!
  - I'm, not a photographer, but I can picture you and me together!
- **What it is...is an opportunity to...**
  - Promote networking
  - Broaden perspective
  - Learn from peer experiences
  - Get a reality check
  - Avoid re-inventing the wheel
  - Set up future benchmarking opportunities
  - Find a new drinking buddy...!

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# **Understanding and Controlling the Risk of Self-checkout Technologies**

**Learn • Engage • Contribute • Challenge**

# The Agenda for Today

- Recap Day One and Expectations Review for the **Day**
- The Rise of 'Frictionless' Shopping and Self-checkout: **Understanding The Impact**
- Developing a Framework for Managing Self-checkout in Retailing:
  - The Role of People
  - The Role of Technologies
- Developing a **Collaborative** and **Systemic Approach** to Managing Self-checkout in Retailing
- **Learn • Engage • Contribute •**  
**Expectations Review and Next Steps**

# EXPECTATIONS

- x UNDERSTAND BEST PRACTICE ON SCO
- x NEW WAYS TO MITIGATE SCO SHRINK / RISK
- x ANALYSE SCO-RELATED DATA / KPIS
- x MANAGE EFFICIENCY WITH CONTROL
- x IDENTIFY SCO-RELATED RISKS
- x UNDERSTAND CONSEQUENCE OF SCO-RISK
- x HOW TO LEVERAGE SCO TO IMPROVE CUSTOMER EXPERIENCE
- x WAYS TO DELIVER 'FRICTION-LESS' RETAILING IN THE FUTURE
- x HOW IS SCO EVOLVING AND WHAT ARE THE FEARS / CONCERNS / OPPORTUNITIES
- x WHAT ARE THE BENEFITS OF SCO AND IS IT SUSTAINABLE
- x HOW ARE SMALL STORE / BOX USING SCO / RETURN ON ROI - WHAT MEASURES ARE



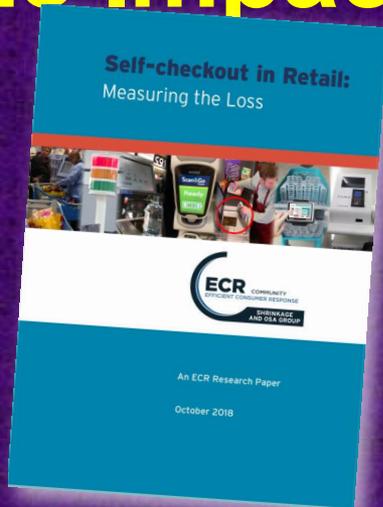
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# **Understanding and Controlling the Risk of Self-checkout Technologies**

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# The Rise of 'Frictionless' Shopping and Self- checkout: Understanding The Impact



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# Growth of Friction-free Shopping

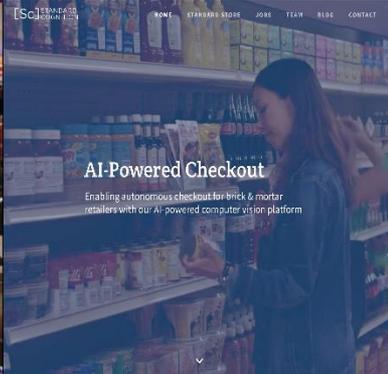
Impact of On-line and growing intolerance of 'friction'



The Amazon Go Store



# Innovation and Retail: Checkout and Pay



## Scanning



RedLaser



SnapTell



ShopSavvy



pic2shop



MORE VIDEOS



# Rise of Self-scan in Retailing

- Initially, exclusively an opportunity to reduce retailer costs and improve efficiency
- Often caused more perceived friction in retail space



# SCO and Front-end Transformation

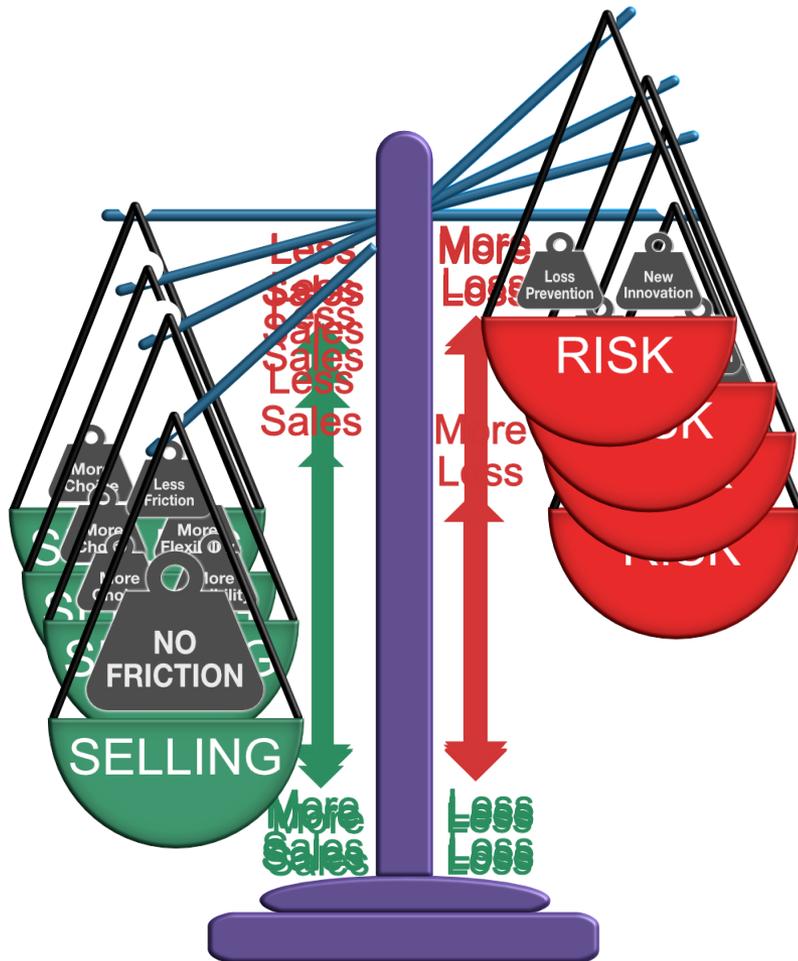
- **Developments in thinking, consumer behaviour and technology:**
  - Enable more checkouts to be available
  - Increase choice of checkout options, more flexibility
  - Reduced queuing, less friction
  - Speed up the shopping journey
  - Improve convenience
- But, at what cost?

# Growing Concern from Loss Prevention About SCO Risks

ECR Meeting January 2016 **14%!**



# Balancing Friction and Risk



Minimise the adverse impacts of business choices to ensure the benefits continue to outweigh the costs

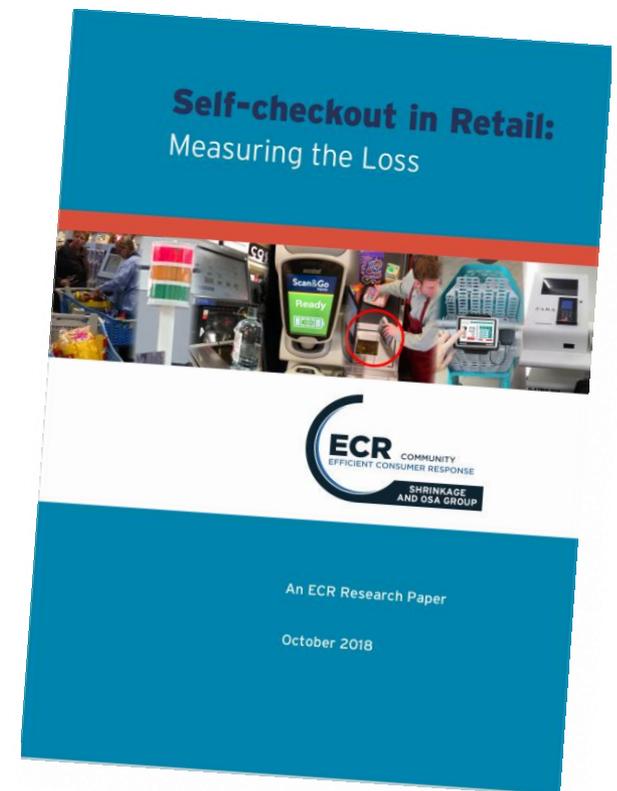
# Background to the Study

- **Objectives**

- Understand the context of self-scan technologies
- Quantify the risk associated with the various types of system
- Review the methods aimed at controlling losses

- **Methodology**

- Bespoke Company Data
- Audit Data
- Interviews with Key Stakeholders
- Store Visits and System Reviews



# Background to the Study

- **24-month Study**
- **13 Major US and European Retailers**
  - Primarily but not exclusively Grocery
- **€586 Billion in Sales**
- **140 Million Scan and Go Transactions**
- **Data on over 17 million Audit Checks**
- **Over 70 Key Stakeholders Interviewed**

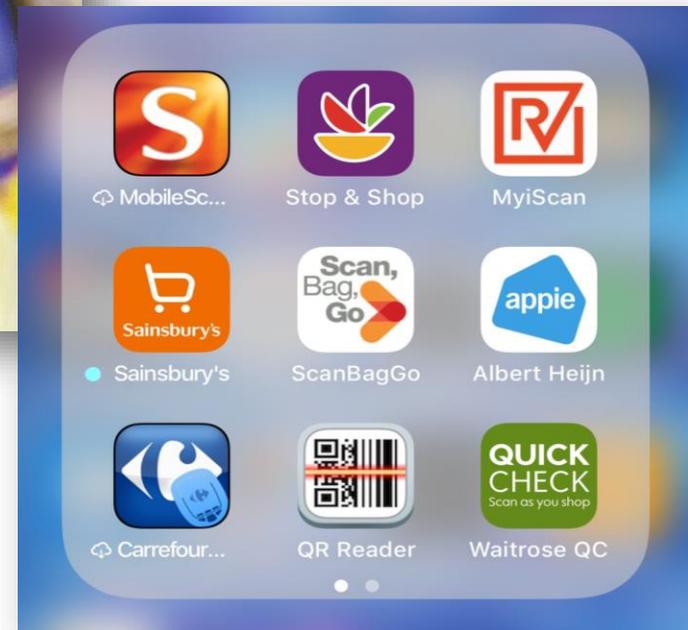
# Types of SCO Considered



**FIXED SCO**



**SCAN & GO SCO**



**MOBILE SCAN & GO**

# Challenges of Measuring SCO Losses

- Measuring Non-scanning
- Measuring Mis-scanning
- Measuring Walk-aways



# Available Fixed SCO Data

- **Before and After Studies** X
- **With and Without Studies** ✓
- **Utilisation Studies**
  - Stores with varying percentages of SCO transactions ✓
  - Stores with different numbers of SCO machines in operation ✓
- **Technology-based Studies**
  - Non-scan video monitoring ✓
  - SCO behaviour video audits ✓
- **Mis-scanning Analysis** X



# Available Scan & Go/Mobile SCO Data

- Before and After Studies **X**
- With and Without Studies **✓**

## • Insights from Audit Checks

Partial  
Re-scan

Full  
Re-scan

Number of audits

✓

✓

Number of failed audits

✓

✓

Under v Over-scanning

✓

**X**

Impact on inventory  
accuracy

✓

**X**

Impact on retail loss

✓

✓

Loss to utilisation rate

✓

✓

Error rate by basket size

**X**

✓

Probability of error by

**X**

✓



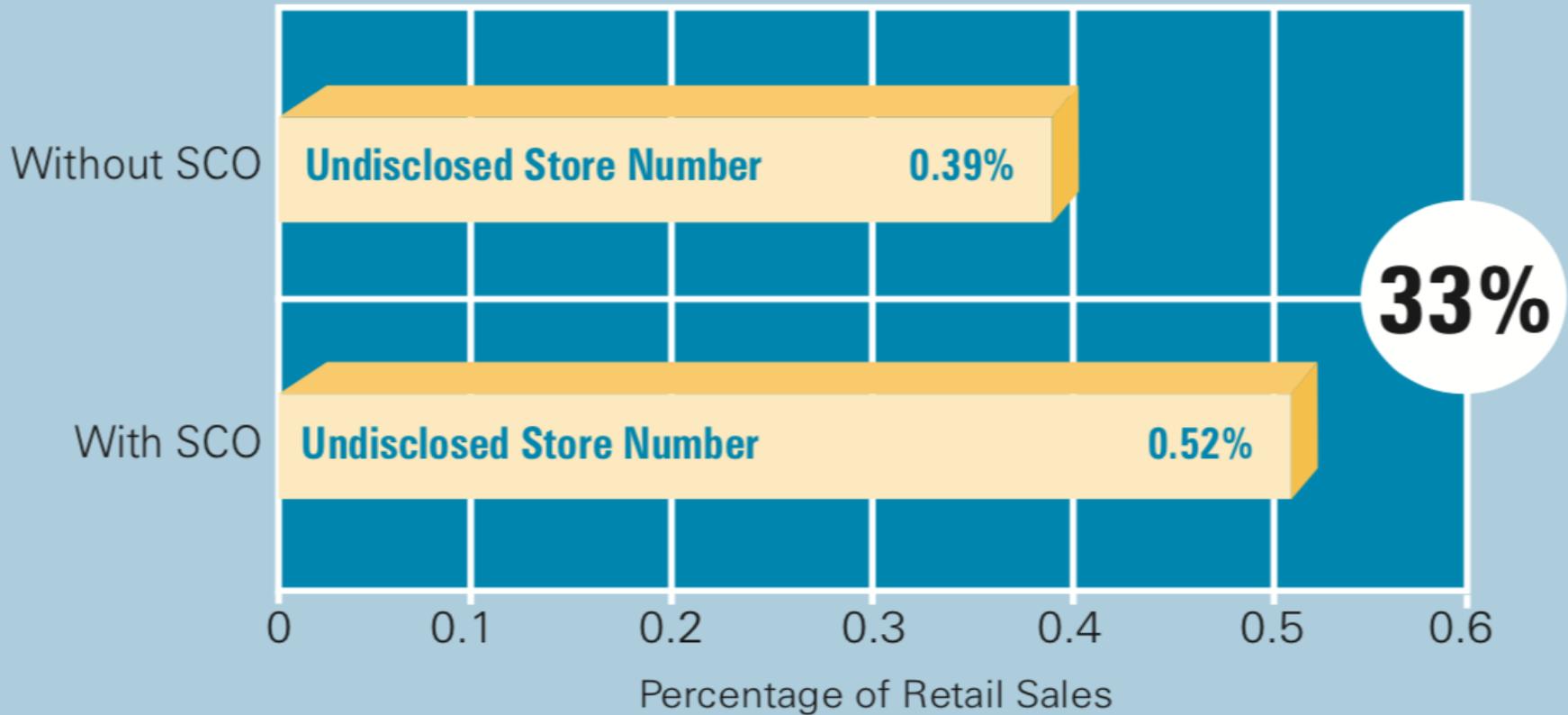
# Main Causes of SCO Losses and Error

## LOST PROFITS FROM SCO



# FIXED SCO: With and Without Comparisons

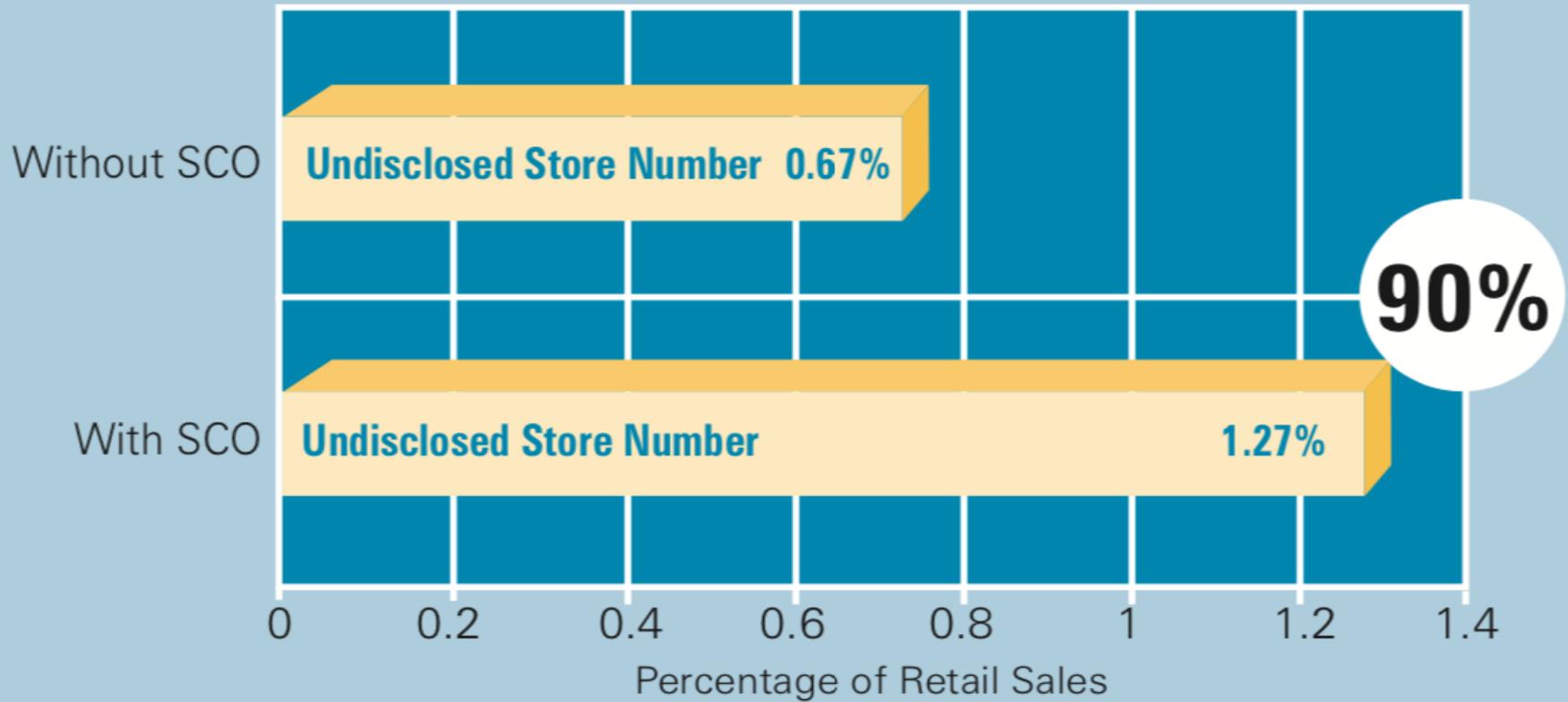
## CASE STUDY 1: GROCERY



3 Years of data

# FIXED SCO: With and Without Comparisons

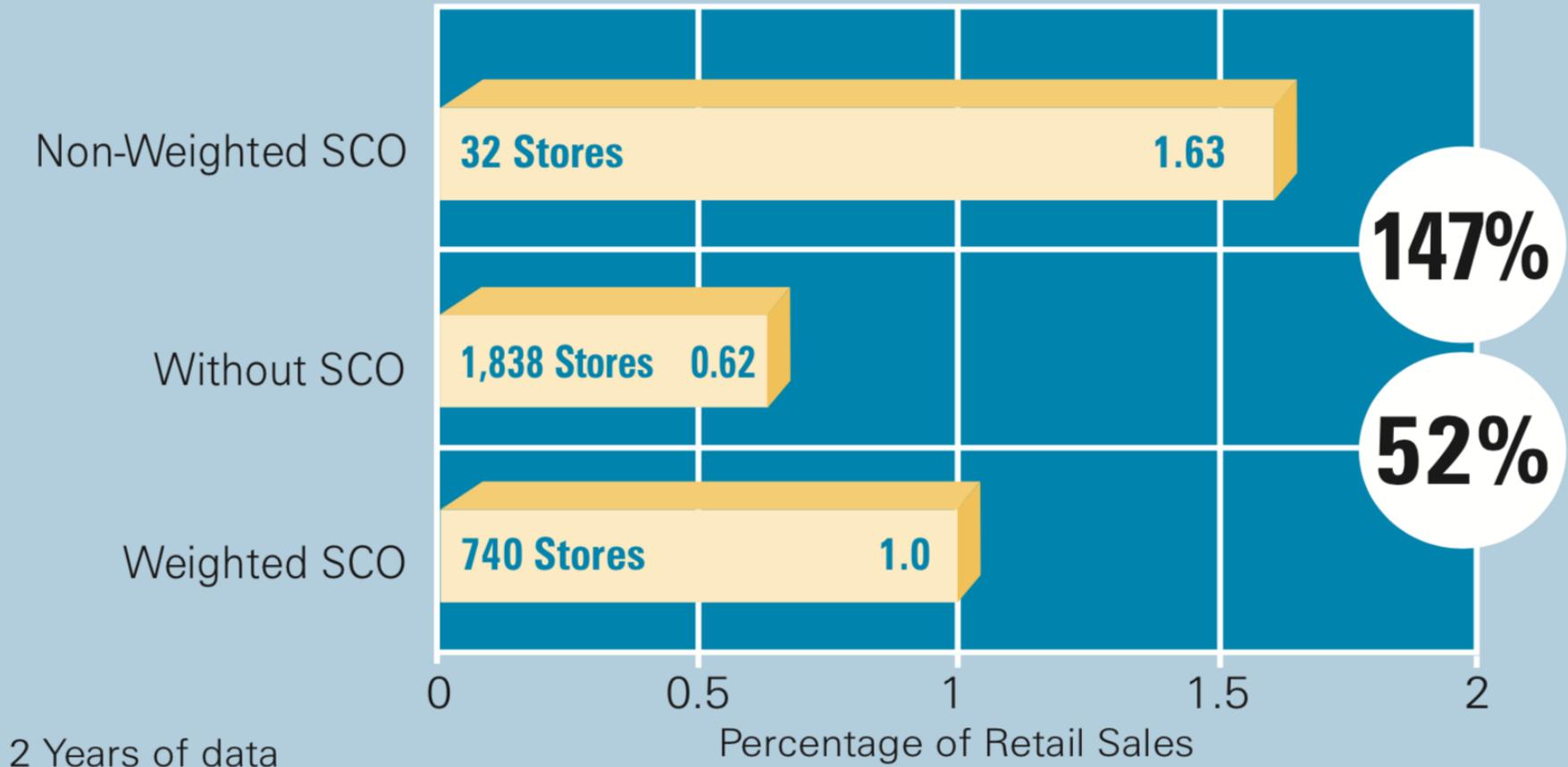
## CASE STUDY 2: GROCERY



1 Year of data

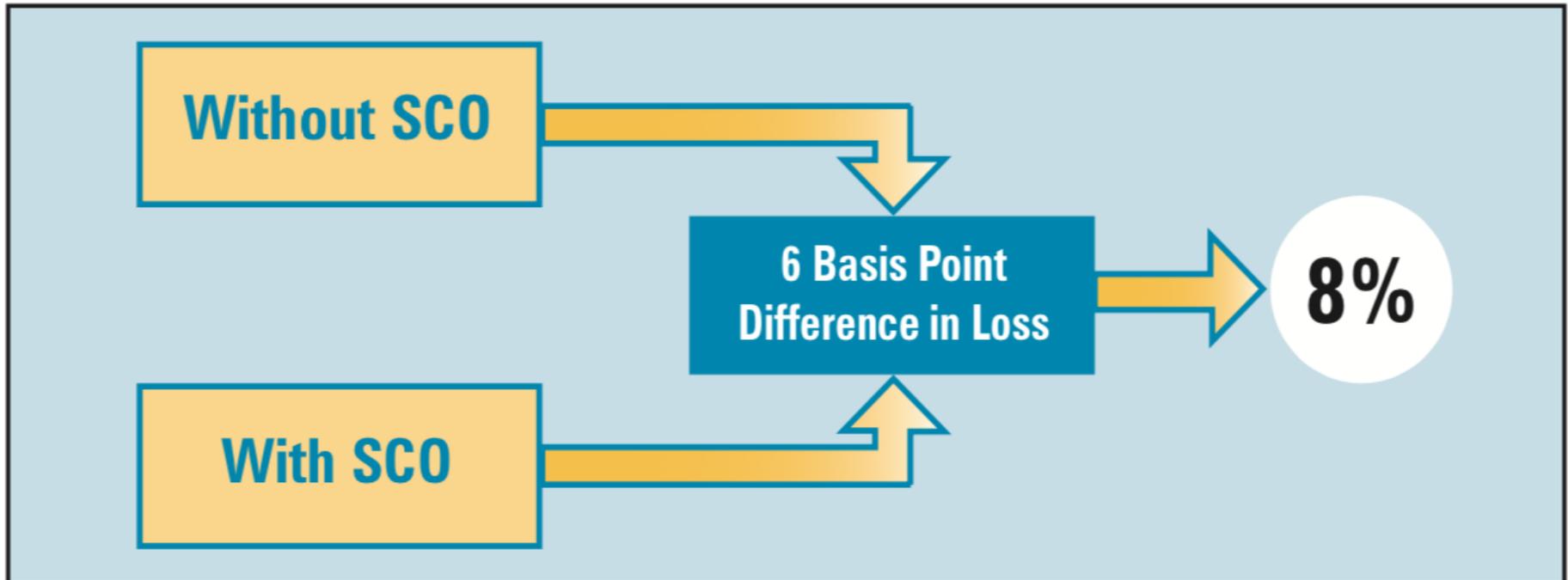
# FIXED SCO: With and Without Comparisons

## CASE STUDY 3: GROCERY

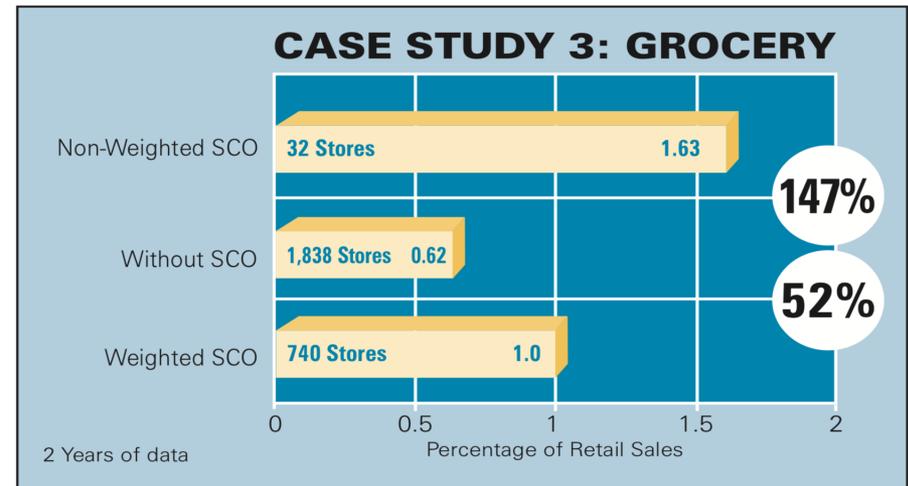
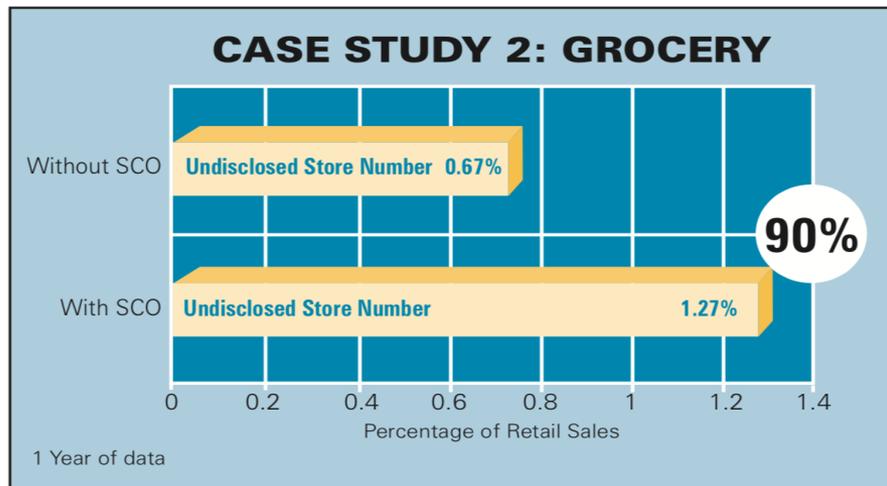
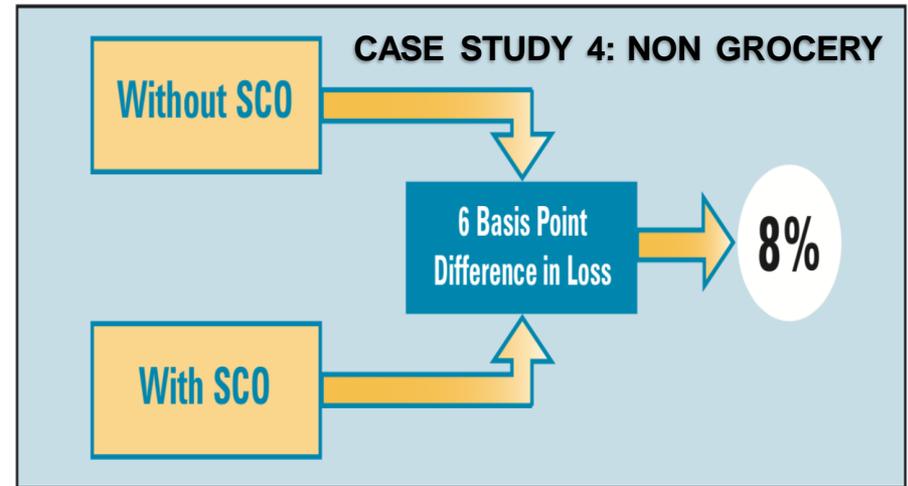
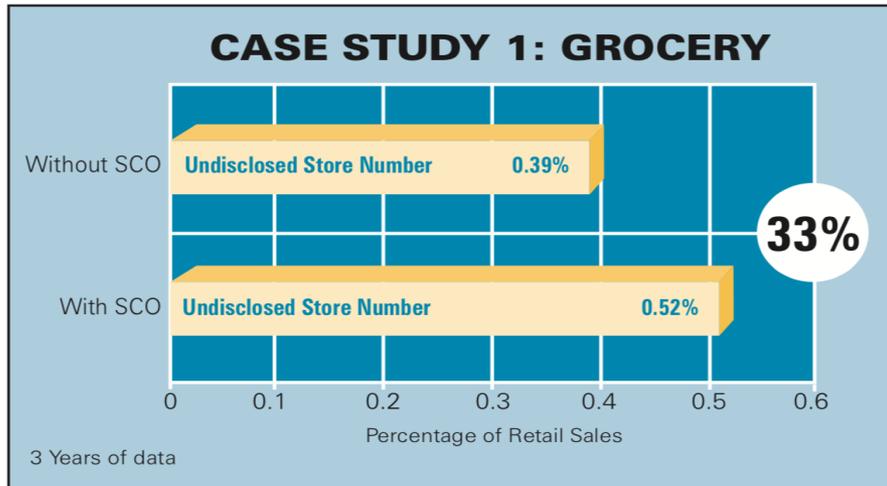


# FIXED SCO: With and Without Comparisons

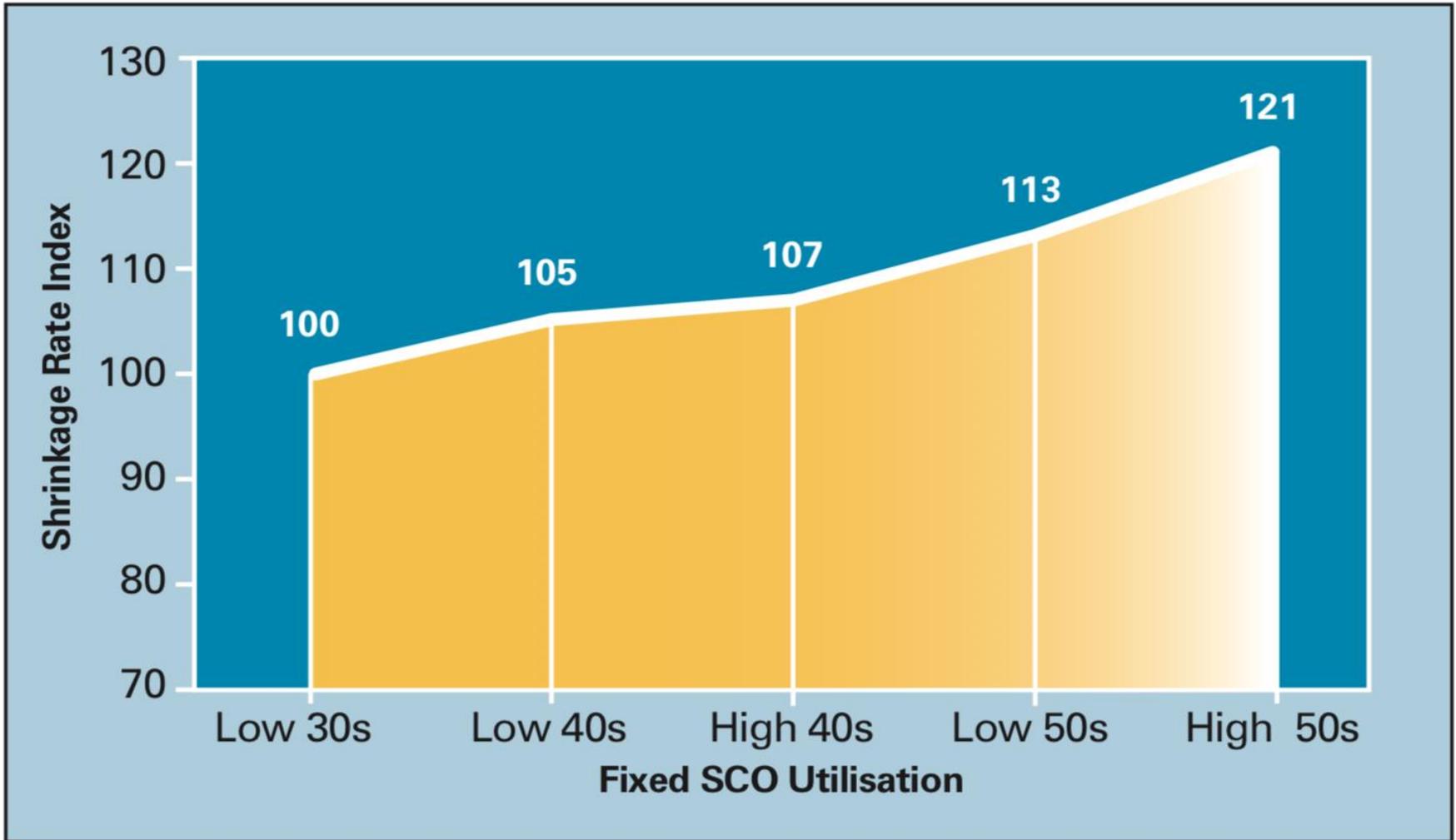
## CASE STUDY 4: NON GROCERY



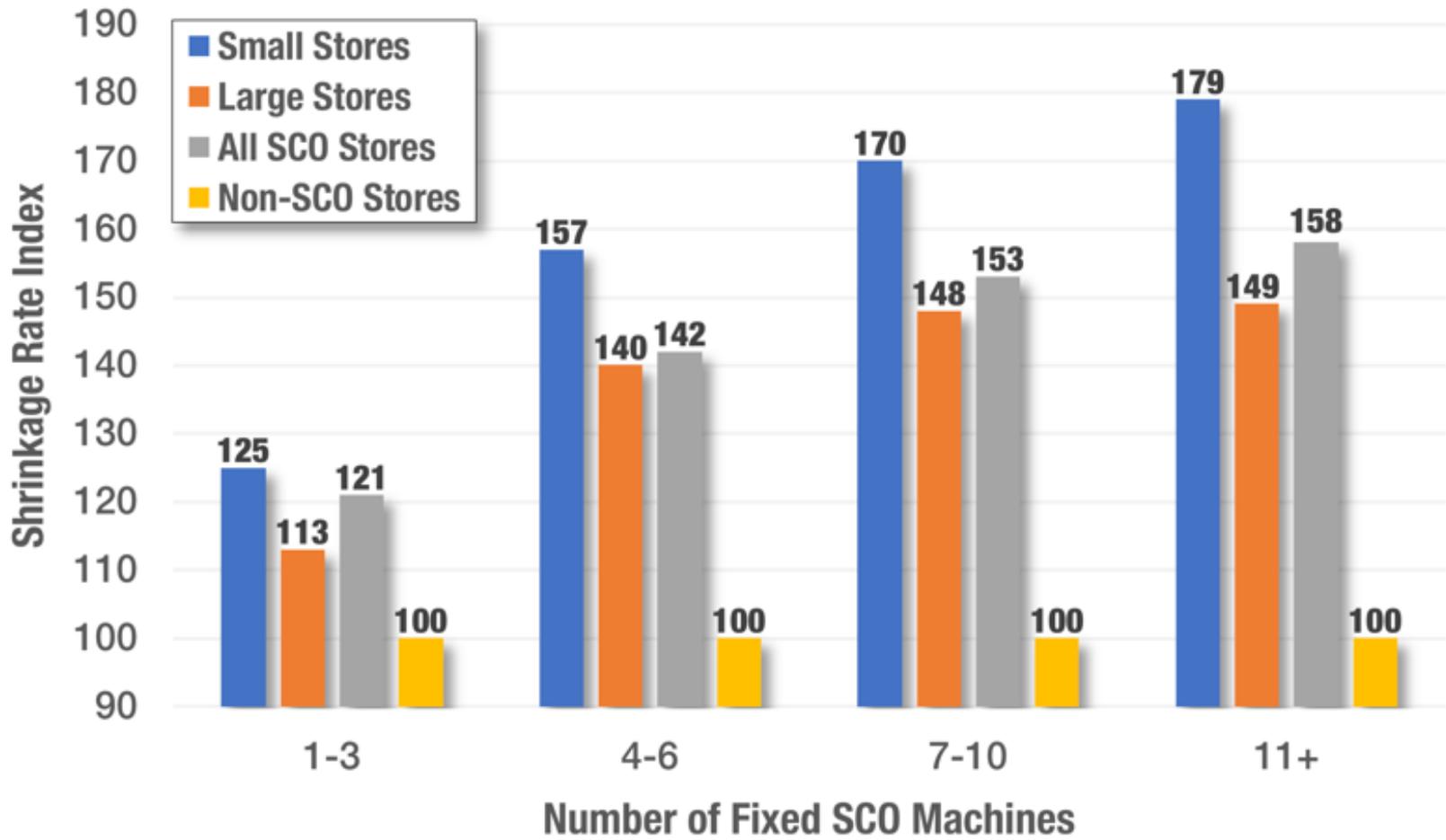
# FIXED SCO: With and Without Comparisons



# FIXED SCO: Utilisation Data



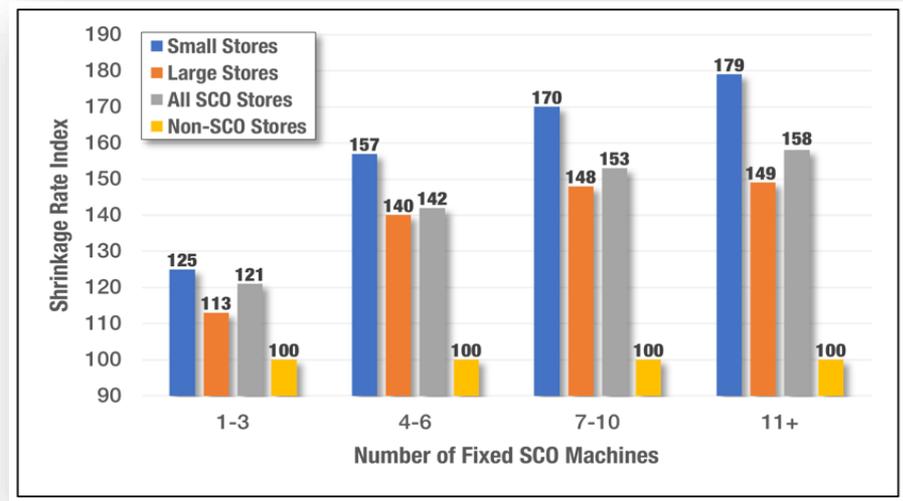
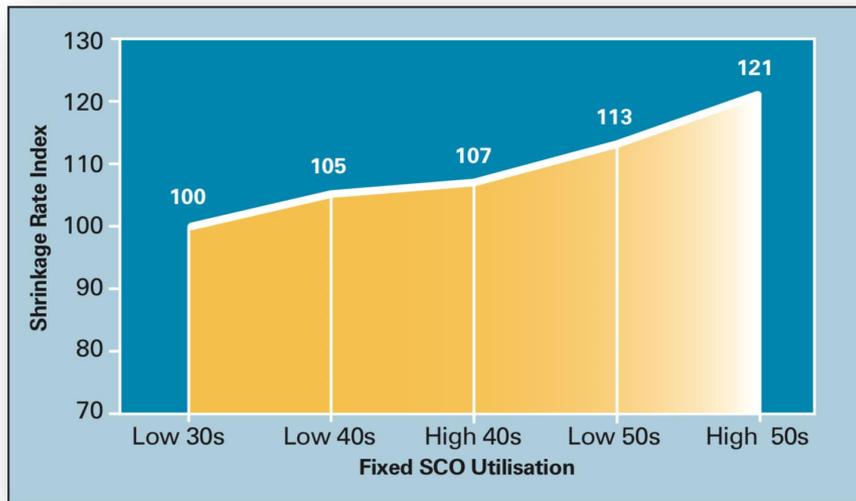
# FIXED SCO: Utilisation Data



# FIXED SCO: Technology-based Data

Key Measures	Rates of Loss
Average Utilisation Rate (value)	27%
SCO Loss as % of SCO Sales	0.44%
SCO Loss as % of Total Shrink	9.48%
SCO Loss as % of all Sales	0.12%
Loss Rate to Utilisation (Value)	0.45 basis points per 1%

# FIXED SCO: A Summary



Key Measures	Rates of Loss
Average Utilisation Rate (value)	27%
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SCO Loss as % of Total Shrink	9.48%
SCO Loss as % of all Sales	0.12%
Loss Rate to Utilisation	0.45 basis points per 1%

**Given existing data:  
1 Basis Point of  
Additional Loss  
per 1% Utilisation  
(Value)**

# Scan and Go Results

## SCAN & GO

### Partial Re-scan Audit Checks

140 million Shopping Trips  
€6 Billion Sales  
17 Million Audits

Key Measures	Indicators
Utilisation Rate	2.82%
Rate of Auditing	12%
Re-scan Error Rate	2.88%
Inventory Error Rate	0.52%
Net Loss Rate	0.31%
Loss to Utilisation	0.7 BPs per 1%

## SCAN & GO

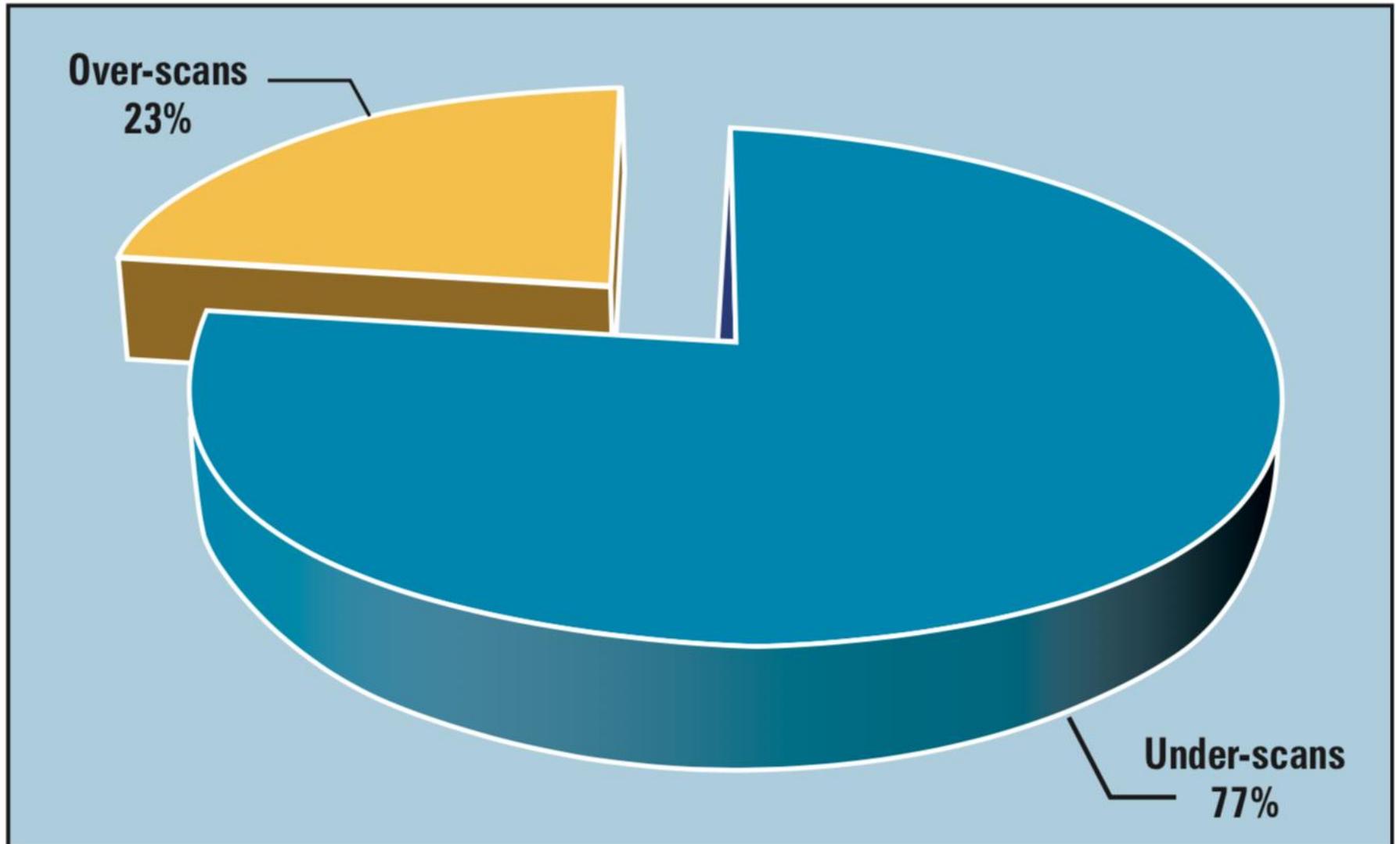
### Full Re-scan Audit Checks

540,000 Items  
€1 Million Sales  
20,000 Audits

Key Measures	Indicators
Number of Audits	19,798
Re-scan Error Rate	43.4%
Net Loss Rate	4.68%
Loss to Utilisation	10.4 BPs per 1%

**1,407% Higher Error Rate  
than Partial Re-scans**

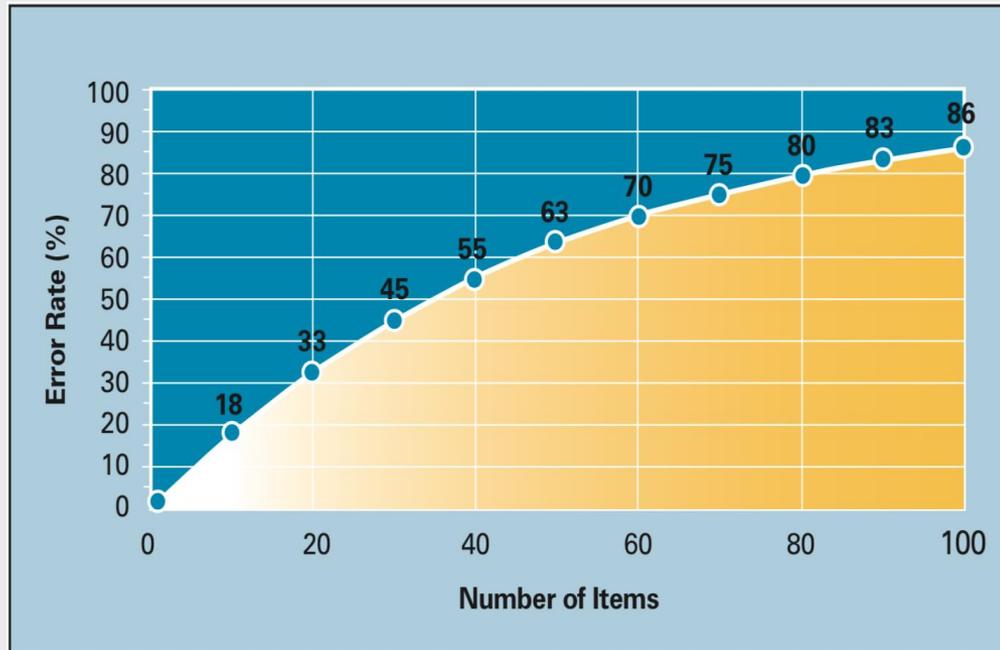
# Rate of Over-scanning v Under-scanning



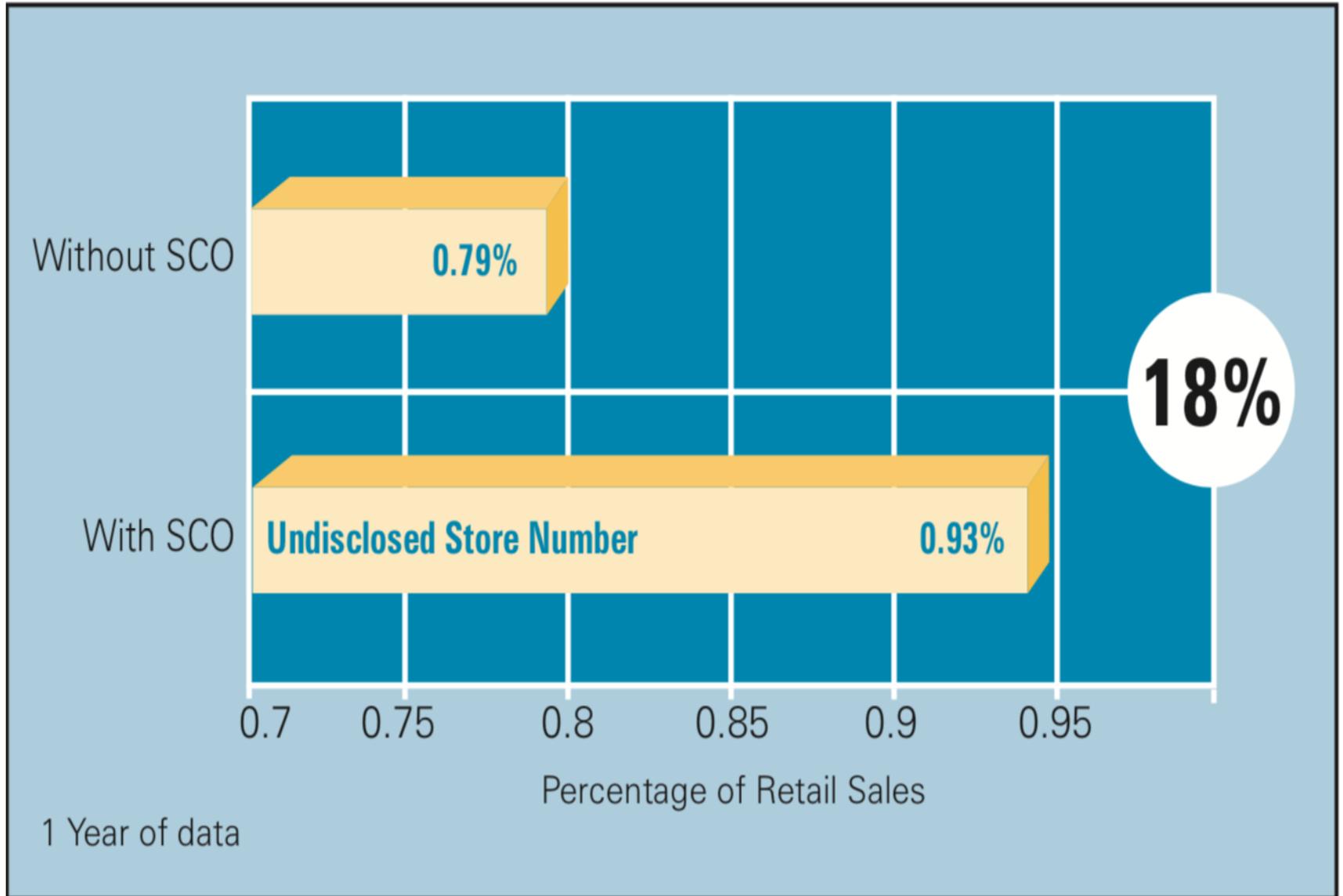
# Impact of Basket Size on Error Rate

SCAN & GO

## Full Re-scan Audit Checks: Probability of Error



# Stores With/Without Scan and Go Comparison



# Calculating the Impact of Front-end Configurations

## Assumptions

- **Unknown loss is 0.67% of retail sales**
- **In fully staffed checkout stores 18% of unknown loss occurs at the checkout\***
- **This represents a loss to utilisation rate of 0.12 basis points per 1% of utilisation**

Front End Utilisation	Utilisation Rate (%)	Unknown Loss (%)	Difference in Loss (%)
Staffed Checkouts	73	0.09	
Fixed SCO	25	0.25	
Scan and Go (Option 2)	2	0.10	
Total	100	0.44	
<i>Non-Front End Loss</i>		0.55	
<b>Total Unknown Loss</b>		<b>0.99</b>	<b>47%</b>
Scan and Go Loss Options	Loss per 1% Utilisation	Total Unknown Loss	Difference in Loss (%)
1) Partial Scan Rate	0.007	0.90	35%
2) With and Without Scan Rate	0.05	0.99	47%
3) Full Audit Scan Rate	0.104	1.10	63%
Assumptions			
Total Unknown Loss	0.67		
Proportion of Loss at Front End	18%		

\* Based upon an analysis of 1 million staffed checkout transactions over a 6-week period

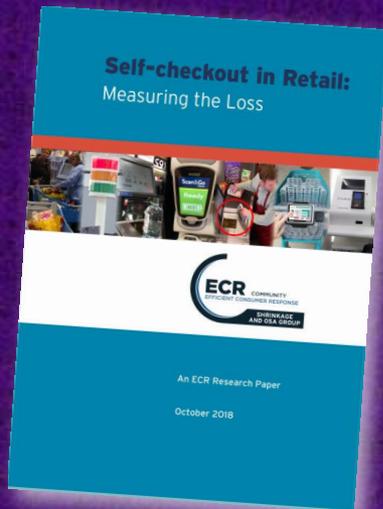
# Round Table Session 1



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- How do the results presented in this session compare with the experiences in your business?
- What lead indicators are you using in your business to monitor SCO losses?

# Developing a Framework for Managing Self-checkout in Retailing



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**AMPLIFY RISK & ENHANCE DETECTION**

**COMPLIANCE**

Guardianship

Technology

Process

Design

**CONTROLLING THE SCO ENVIRONMENT**

**MINIMISE PRODUCT-DRIVEN ERRORS**

# Minimising Product-Driven Errors



**AMPLIFY RISK & ENHANCE DETECTION**

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**CONTROLLING THE SCO ENVIRONMENT**

**MINIMISE PRODUCT-DRIVEN ERRORS**

# Risk Amplification



- **Understanding the Role of Risk in Crime Prevention**
- **Offender Decision Making**

Will I get caught?

How easy is it to do it?

Is it worth it?

If I get caught, what will happen?

## **If the would-be offenders thinks...**

I won't get caught; it's really easy; it's certainly worth it; even if I'm caught nothing much will happen....

...What is likely to happen?

# Offender Decision-making

AMPLIFY RISK & ENHANCE DETECTION

COMPLIANCE

Guardianship

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Process

Design

**CONTROLLING THE SCO ENVIRONMENT**

MINIMISE PRODUCT-DRIVEN ERRORS

- 1 Will I get caught?
- 2 How easy is it to do it?
- 3 Is it worth it?
- 4 If I get caught, what will happen?



Crime Continuum

**How does this  
play out in the  
SCO  
environment?**

# Retail Risk Amplifiers

AMPLIFY RISK & ENHANCE DETECTION

COMPLIANCE

Guardianship

Technology

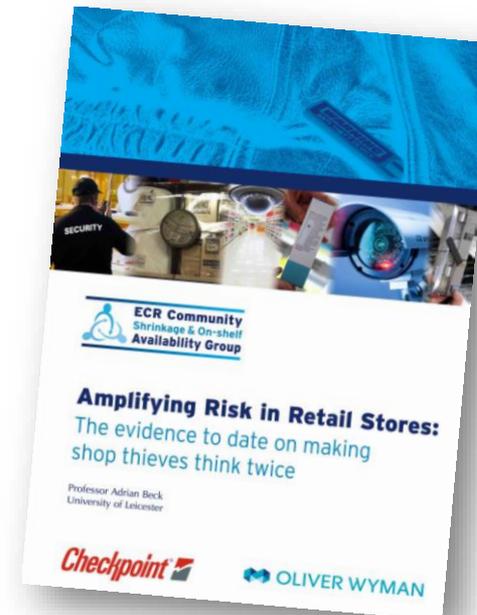
Process

Design

CONTROLLING THE SCO ENVIRONMENT

MINIMISE PRODUCT-DRIVEN ERRORS

- Tagging Technologies
- Video Technologies
- Security & Sales Staff
- Store Design & Layout
- Shelf-based Interventions



**AMPLIFY RISK & ENHANCE DETECTION**

**COMPLIANCE**

**Guardianship**

**Technology**

**Process**

**Design**

**CONTROLLING THE SCO ENVIRONMENT**

**MINIMISE PRODUCT-DRIVEN ERRORS**

# Controlling SCO: The Role of People

AMPLIFY RISK & ENHANCE DETECTION

COMPLIANCE

Guardianship

Technology

Process

Design

**CONTROLLING THE SCO ENVIRONMENT**

MINIMISE PRODUCT-DRIVEN ERRORS

- **Understanding the Value**

*We have a front-end transformation agenda, but we have not yet transformed the front attendant ... we have transformed everything but them. We should be having a higher-level person in this role ... this is a different job ... managing a new piece of the business.*

- **Effective SCO Supervision – Active Guardianship**

*What we are saying is that we should have our most engaged, people centric, verbose, service-driven people in SCO and often times you will have an introvert up there that wouldn't say boo with a mouthful. And they have been relegated there.*

# Effective SCO Supervision

AMPLIFY RISK & ENHANCE DETECTION

COMPLIANCE

Guardianship

Technology

Process

Design

**CONTROLLING THE SCO ENVIRONMENT**

MINIMISE PRODUCT-DRIVEN ERRORS

## Risk Awareness Training

*'we are introducing more off the floor training to help them understand the risks present at SCOs – we need to make them aware of the various scams that we have seen at SCO.'*

## Customer Engagement

*'Anything that can make people think they are being watched and observed is good, but it has to be done in the right way – this is what is going to make the biggest difference'; 'need to give SCO supervisors the confidence to step in when they see something suspicious'.*

## Delivering Customer Training

*'turn a possible theft scenario into a coaching moment, so always make it non-confrontational; 'the fact that they [the shopper] has ended up with 10 yoghurts in their basket but only scanned three – "let me help you with that as these items don't seem to have scanned properly".'*

## Customer Prioritisation

*'we have a training programme for how you deal with multiple red lights on SCO and reading customer body language – who gets service first – mum with screaming kid versus bloke with a beer?'*

# Effective SCO Supervision

AMPLIFY RISK & ENHANCE DETECTION

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CONTROLLING THE SCO ENVIRONMENT

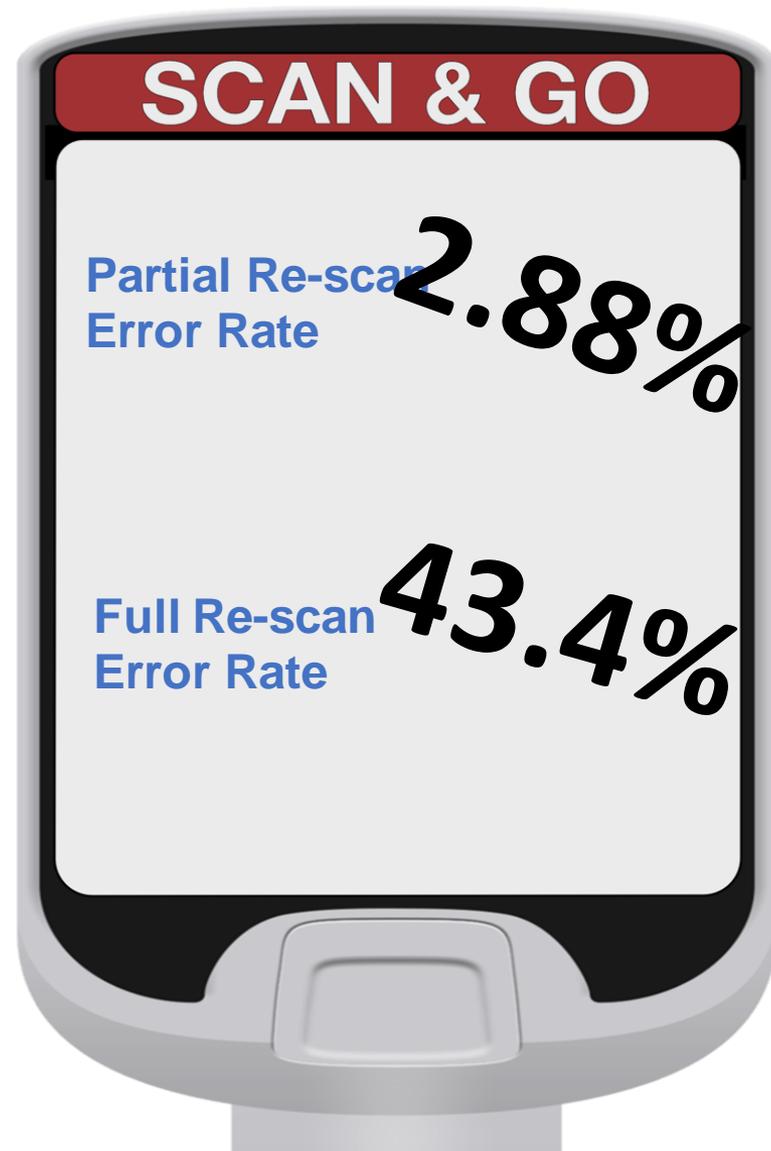


Keeping Customers Honest and Accurate

# Effective SCO Supervision – Partial Audits

Training and support to close the gap

- What should they look for?
- Ranking value of items?
- Fresh produce with the same weight?
- Promotional items?
- Risky items checklist?
- Multi-variety issues?
  
- Careful selection of staff to deal with a potentially tense experience for all concerned.



# Controlling Fixed SCO: Guardian/Machine Ratio



## 5-6 Machines

### Ratio Impact Factors

- Supervisor Capability
- Design of SCO Environment
- Delivering Scan & Go Audits
- Age-restricted Products on Sale
- Removable Product Protection in Use
- Sensitivity of Alerting Technologies
- Product Weight Database in Use

**LOWER**

**HIGHER**

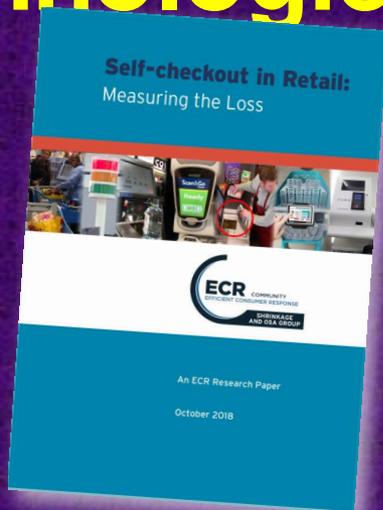


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# Round Table Session 2

- Thus far, how well has your business used people to manage SCO and what lessons have you learnt?
- What changes might you make based upon what you have heard/plans for the future?

# Developing a Framework for Managing Self-checkout in Retailing: **The Role of Technologies**



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# AMPLIFY RISK & ENHANCE DETECTION

## COMPLIANCE

Technology

**Scan Verification**

**Product Verification**

Weight Checking

Video Technologies

Analytics

# Scan Verification Technologies: Weight Checking

*weight scales – it caused so many interventions that we took the decision to switch it off*

*we did think about turning it off completely but it was seen as a step too far for the business at that time*

*in this company there is a firm defence on the value of weigh scales – this is our safety net*



# AMPLIFY RISK & ENHANCE DETECTION

**COMPLIANCE**

Technology

**Scan Verification**

**Product Verification**

Weight Checking

Video Technologies

Analytics

# Video Technologies

**AMPLIFY RISK & ENHANCE DETECTION**  
COMPLIANCE  
Technology  
Scan Verification | Product Verification  
Weight Checking | Video Technologies | Analytics

## Passive

- Public View Monitors
- Personal Display Monitors
- Visual Deterrence



## Active

- Non-scanning Alerts
- Alert Verification



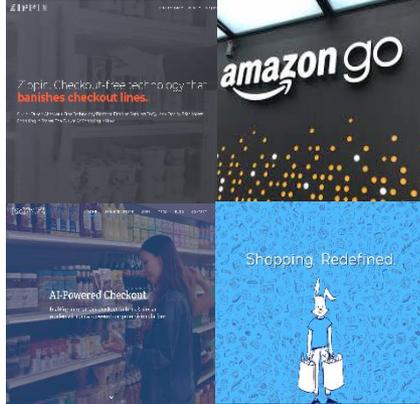
## Pro Active

- Product ID
- Age Verification
- In Aisle Monitoring
- Exit Control



## Seamless

- Auto-shopping
- Consumer & Produce ID & Auto Payment



# Benefits and Challenges

**AMPLIFY RISK & ENHANCE DETECTION**  
COMPLIANCE  
 Technology  
 Scan Verification    Product Verification  
 Weight Checking    Video Technologies    Analytics

<b>Passive</b>	<b>Active</b>	<b>Pro Active</b>	<b>Seamless</b>
<ul style="list-style-type: none"> <li>• Public View Monitors</li> <li>• Personal Display Monitors</li> <li>• Visual Deterrence</li> </ul>	<ul style="list-style-type: none"> <li>• Non-scanning Alerts</li> <li>• Alert Verification</li> </ul>	<ul style="list-style-type: none"> <li>• Product ID</li> <li>• Age Verification</li> <li>• Enhanced Audit</li> <li>• Exit Control</li> </ul>	<ul style="list-style-type: none"> <li>• Auto-shopping</li> <li>• Consumer &amp; Produce ID &amp; Auto Payment</li> </ul>
<b>Potential Benefits</b>			
<ul style="list-style-type: none"> <li>• Cheap</li> </ul>	<ul style="list-style-type: none"> <li>• Enable better measurement of impact</li> <li>• Enhance security &amp; speed of transactions</li> </ul>	<ul style="list-style-type: none"> <li>• Strong deterrent potential</li> <li>• Address mis-scanning</li> <li>• Speed up transactions</li> <li>• Increase efficacy of supervisors</li> </ul>	<ul style="list-style-type: none"> <li>• VERY low levels of friction</li> <li>• Customer satisfaction</li> <li>• Speed</li> <li>• Labour saving</li> <li>• End of shop theft?</li> </ul>
<b>Potential Challenges</b>			
<ul style="list-style-type: none"> <li>• Does it make a difference?</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable and accurate?</li> <li>• Provide ROI?</li> </ul>	<ul style="list-style-type: none"> <li>• Issues with accuracy &amp; speed?</li> </ul>	<ul style="list-style-type: none"> <li>• Scalability?</li> <li>• Accuracy?</li> <li>• Cost?</li> <li>• Managing exception products?</li> </ul>

# Scaling Seamless Video Technology



## Average Size of Grocery Store



Possibly as many as 3,000 Cameras & Weight-based Shelving

## Current Size of Amazon Go Stores



Approximately 15 Times Larger

# AMPLIFY RISK & ENHANCE DETECTION

**COMPLIANCE**

Technology

**Scan Verification**

**Product Verification**

Weight Checking

Video Technologies

Analytics

# Analytics



- **Supervisor Assistance**
  - Improving efficacy of partial audits
- **Audit Selection Algorithms**
  - Which factors have the highest prediction value?
- **Real-time SCO Analytics**
  - Where should the SCO Supervisor be looking?



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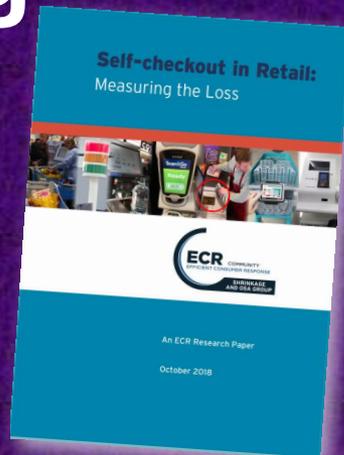
# Round Table Session 3

What, if any, self-scan technologies are you considering to:

- verify scanning
- verify product identity
- amplify risk

What are the potential benefits and challenges that you see to the use of technologies?

# Developing a Collaborative and Systemic Approach to Managing Self-checkout in Retailing



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# The SCO Management Pyramid

- **Based upon a model developed to manage LP**



# The SCO Management Pyramid



**Senior Management Commitment**

# The SCO Management Pyramid

‘Those who were tasked with rolling out self-scan have had a **complete abdication of duties** around losses. As far as they were concerned it wasn’t part of their remit and it was something for the LP team to sort out’

‘From a mobile point of view we won’t be blocking the trial, but we want the business to be **very clear** that they are collecting the right figures to understand the true impact and that the business case reflects this before a decision is made to roll it out’

**Organisational Ownership**

**Senior Management Commitment**

# The SCO Management Pyramid



# The SCO Management Pyramid

‘Only recently that the voice of LP is beginning to be heard, but only once we began to put data behind it and measure the impact. The power of data has really helped – **it is very compelling**’

‘... really hasn’t been **a culture of investing** in ways to understand what the risk is associated with self-scan – it is hard but not impossible. A **distinct lack of imagination** in how to develop a methodology to achieve this’

... been a little bit frustrating working with the development team – they won’t believe data which might show that losses have gone up and are **inclined to blame other factors** for the change’



# The SCO Management Pyramid



# The SCO Management Pyramid



# The SCO Management Pyramid

- **Across the Business**
- **Product Manufacturers**
- **SCO Technology Providers**
- **Product Protection Providers**



# The SCO Management Pyramid



# The SCO Management Pyramid

- **Cross Functional**
- **Empowered**
- **Resourced**
- **Capable**
- **Informed**



# The SCO Management Pyramid

- Who needs to know what and when?



# The SCO Management Pyramid



# Benchmarking Exercise

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# PIN: 41925



### Benchmarking Exercise for Your Company: Utilising and Controlling SCO

Scale: 0 = Completely non-existent within our company    2 = My company is aligned but more needs to be done  
 1 = Some evidence of alignment but at a low level    3 = My company is fully aligned on this issue

Benchmark Indicators	Your Score	What needs to happen in Your Company to score a 3?
<b>Senior Management Commitment</b> Senior management recognise the need to understand both the benefits and challenges presented by SCO.		
<b>Organisational Ownership</b> All parts of the business recognise that they have a role to play in managing and controlling SCO-related losses.		
<b>Embedded Responsibility</b> All parts of the business are acting to address the problem of SCO-related losses.		
<b>Data Management</b> The company has available actionable, reliable and timely data on SCO-related losses.		
<b>Operational Excellence</b> All parts of the company recognise the need to develop processes and practices that enable SCOs to be managed effectively.		

Benchmark Indicators	Score	What needs to happen to score a 3?
<b>Innovate and Experimentation</b> The company is willing to innovate and experiment to deal with SCO-related losses.		
<b>Collaboration</b> The business collaborates effectively with other organisations to better manage SCO-related losses.		
<b>Prioritising People</b> The company recognises the valuable role people can play in controlling SCO-related losses.		
<b>SCO Leadership</b> There is clear and strong leadership in place to manage ALL aspects of SCO systems used in the business.		
<b>Communication</b> The issue of SCO-related losses is clearly and regularly communicated across the business.		
<b>Store Management Responsibility</b> Store management teams are given the necessary support to deal with SCO-related losses effectively.		
<b>Total</b>		

# European Alignment on SCO Management Pyramid



*This is not based upon a controlled sample of retail representatives, merely those who were present in the room*

# Round Table Session 4



**RETAIL INDUSTRY  
LEADERS ASSOCIATION**

Which elements of the SCO Management Pyramid are not well developed in your business and what might be done to improve this situation?



# RETAIL INDUSTRY LEADERS ASSOCIATION

## The Rise of Self-checkout in Retailing

Understanding the Risk and Managing the Problem



By  
Adrian Beck  
Emeritus Professor



# Understanding and Controlling the Risk of Self-checkout Technologies

Thank You For Attending and Safe Journey  
Home!