



Reference Prices and Retailer Heterogeneity

Nottingham-Exeter

2nd annual TRANSFOP Conference, Toulouse 31 January 2013.



Outline



- Summary of Scanner I: Aspects of retailer heterogeneity in UK food retailing
- Outlook on Scanner II: Price transmission in the dairy sector
- Moving away from retailer heterogeneity: sales of soft drinks in the Tesco scanner data



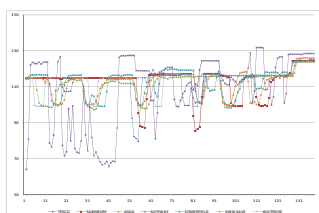
Overview of Scanner I



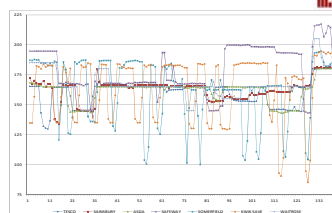
- Weekly data (Nielsen Scantrak), covering the period from September 2001 to April 2004.
- 15 product categories, including wrapped bread, instant coffee, tinned soup and frozen peas.
- 1704 UPCs, 507 products, 7 retailers
- Weekly national average posted prices (including price and quantity promotions)
- Branded goods as well as private label products



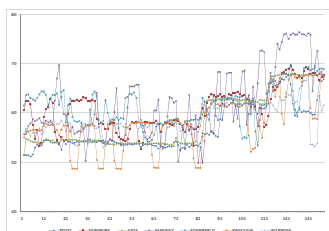
Eyeballing UK Food Retail Price Dynamics



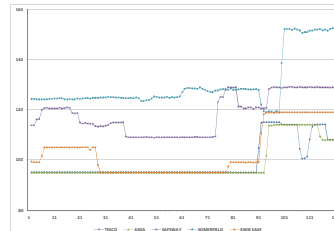
Breakfast Cereal: Weetabix Original 24s



Yoghurt: Muller Light Pot Cheery Single 200g



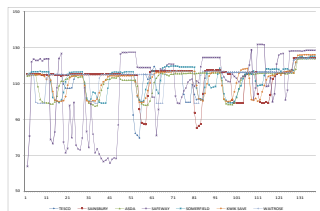
Sliced Bread: Kingsmill Medium Sliced White 800g



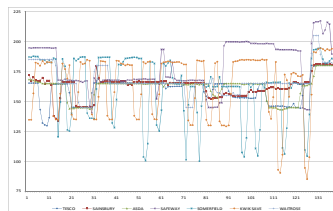
Jam: Streamline Strawberry 400g Jar



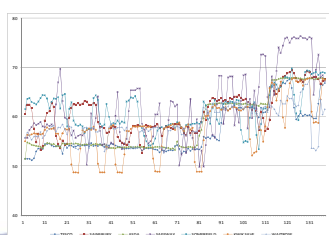
Scanner (UPC) prices



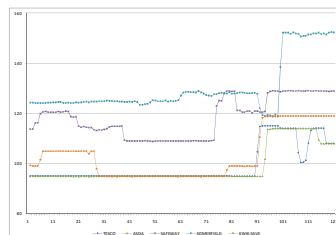
Breakfast Cereal: Weetabix Original 24s



Yoghurt: Muller Light Pot Cherry 200g



Sliced Bread: Kingsmill Medium Sliced White 800g



Jam: Streamline Strawberry 400g Jar

1. Step changes (costs)
2. Temporary declines (sales)
3. Frequent minor adjustment (noise)



Main features of the data



- Posted prices change frequently (implied duration 2.4 weeks), but price changes are small on average (1.8%)
- Average difference between the highest and lowest price of identically barcoded products is 26%
- Sales (of 10% depth) account for 8% of the observations. 63% of UPCs experience a sale at least once during our sample period. Average duration of a sale is 4.5 weeks.



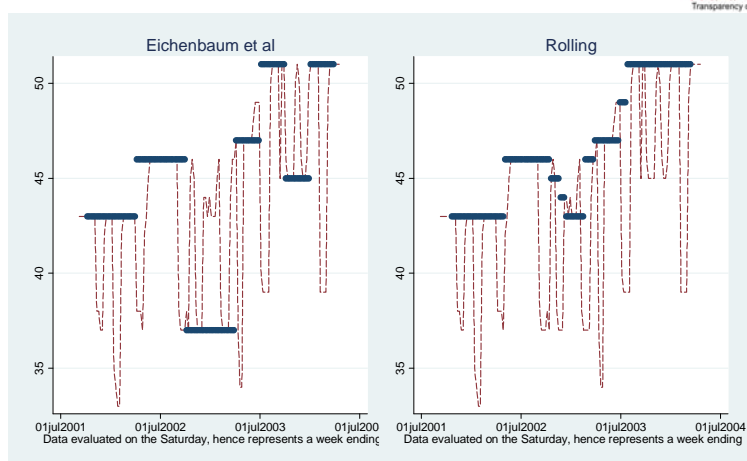
Reference Prices



- In the macro literature, attention has focused on reference prices.
- Reference prices proxied by modal price in each quarter (Eichenbaum, Jaimovich and Rebelo *AER*, 2011)
- We advocate use of a rolling 13 week mode of non-sale prices
 - Does not impose inertia (but will detect it if it's there)
 - Does not force price changes to start at beginning of each quarter
 - Excludes sale prices from being reference price
- Actual prices aren't sticky but reference prices are.



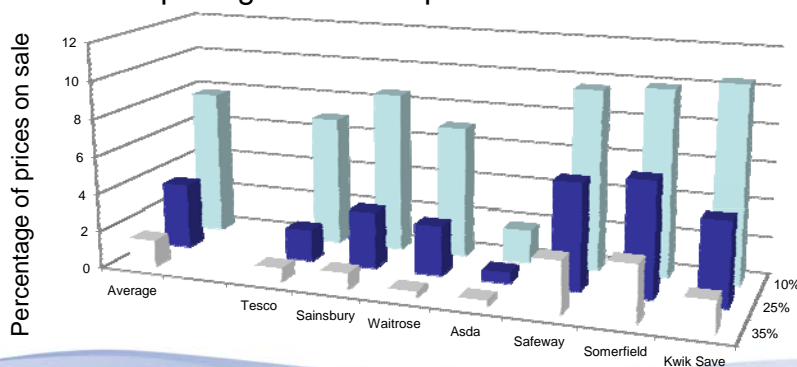
Actual and Reference Prices



Retailer heterogeneity



- Recent work: highlighted the relevance of heterogeneity at the product level (for example Berka et al)
- Macro-pricing models: “representative firm”



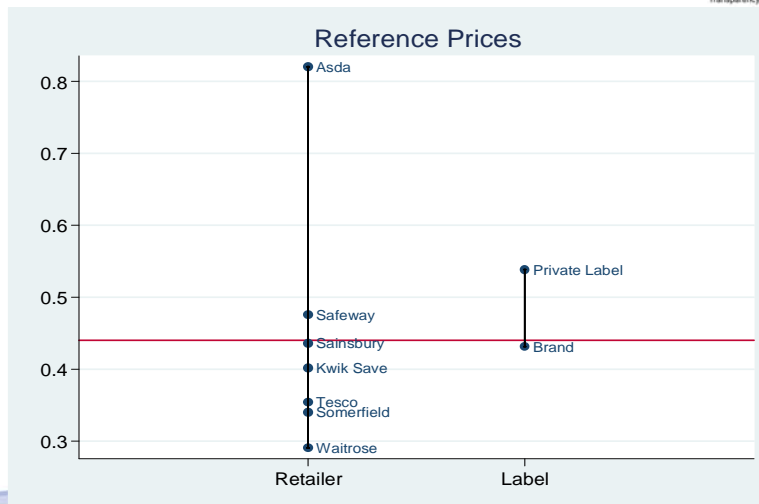
Average Implied Price Durations



	Actual prices	13 Week Rolling Reference Prices	Quarterly Reference Prices
Overall	2.4	13.9	26
Retailer			
Asda	3.6	20.8	32.5
Tesco	2.9	20.8	32.6
Sainsbury	2.5	15.6	32.5
Kwik Save	2.2	13.9	26
Waitrose	2	15.6	32.5
Somerfield	1.9	11.4	26
Safeway	1.9	8.9	18.6
Retailer			
Own Label	3	17.9	32.5
Brand	2.3	13.8	26



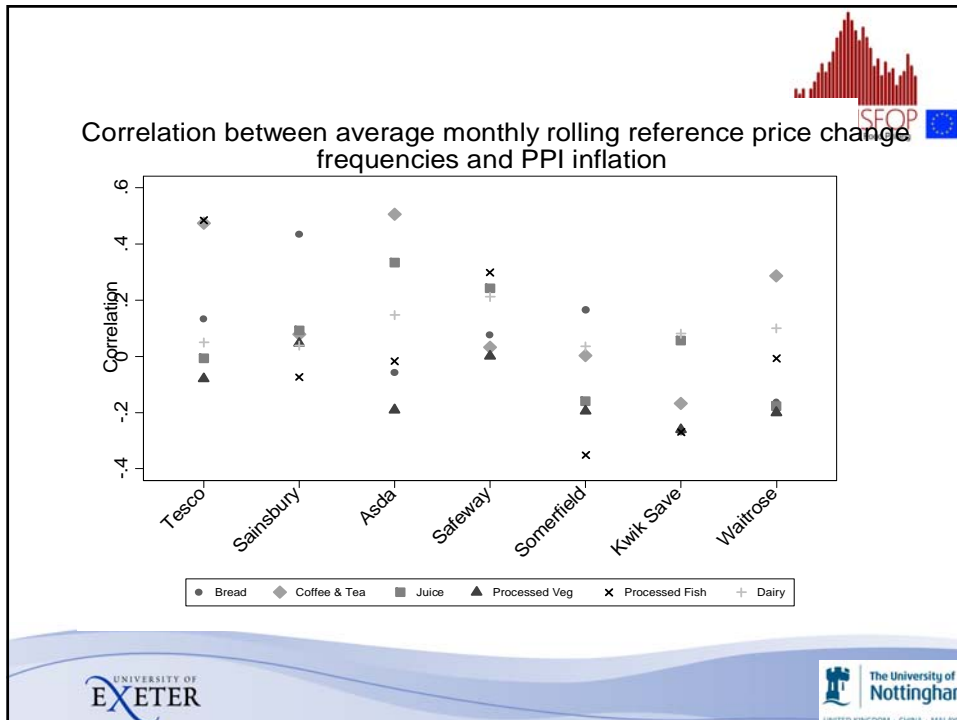
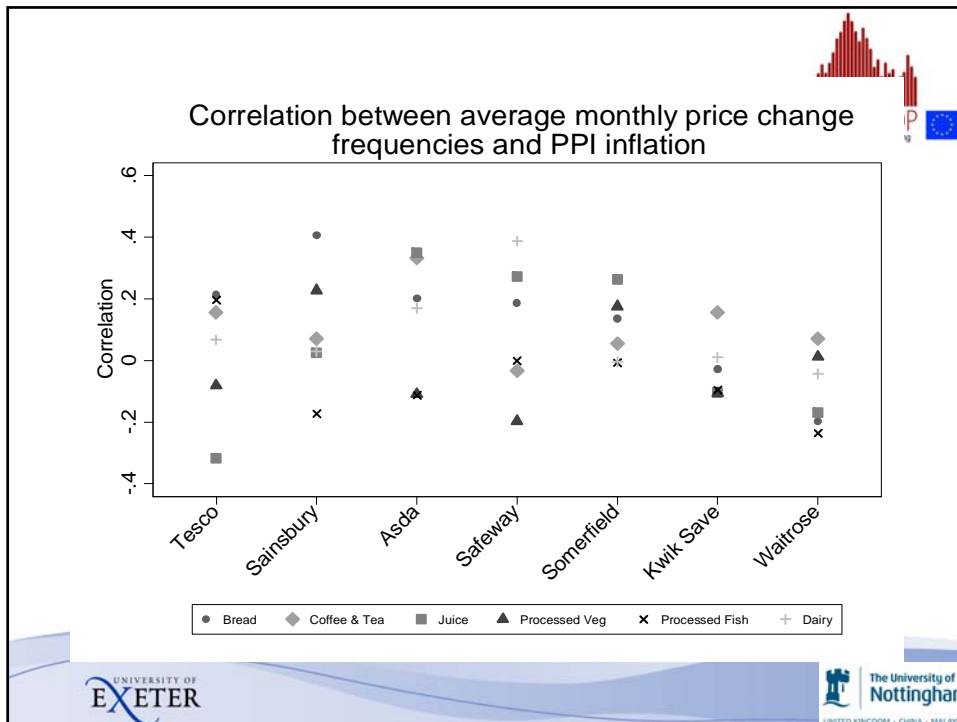
Contribution of Reference Prices to Price Variation (all UPCs)-using RRF

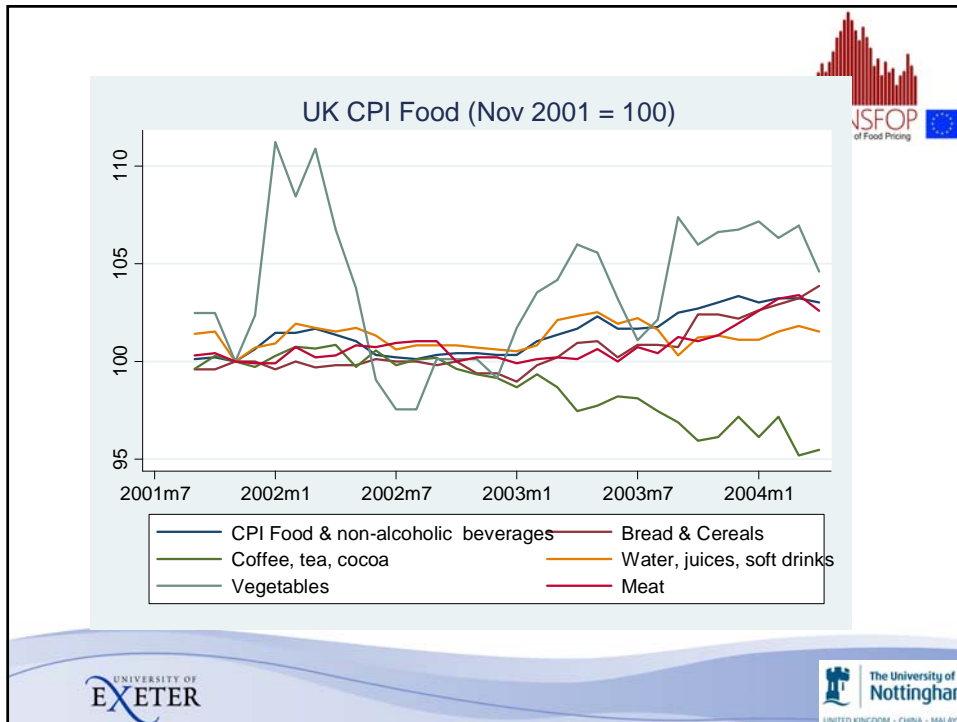
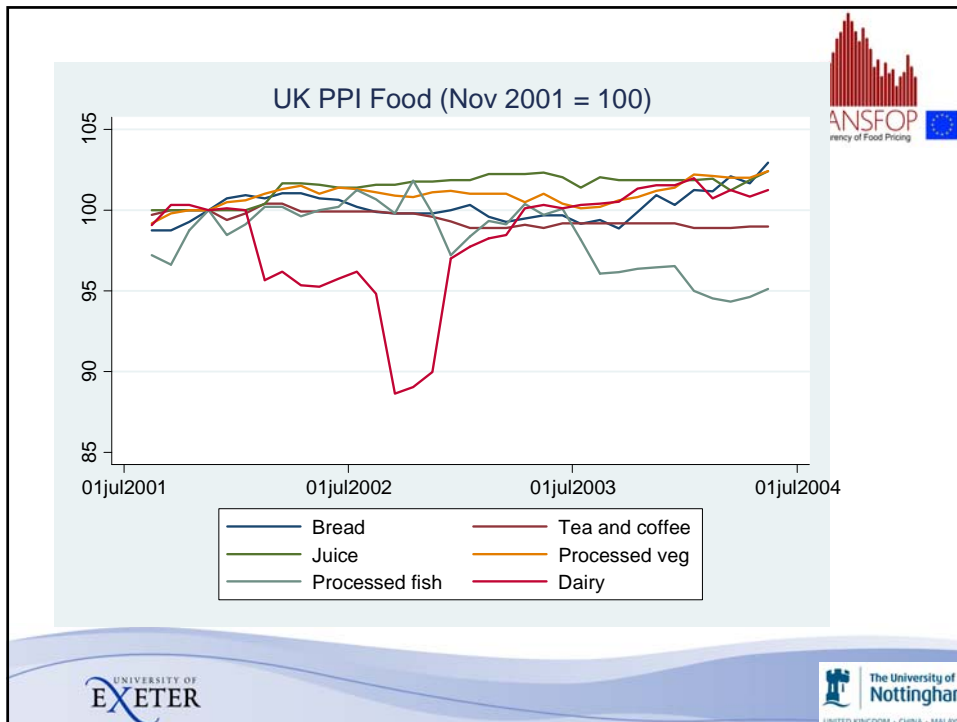


Reference prices and inflation



- If reference prices matter for menu cost models, the frequency of price changes should correlate with inflation.
- High aggregate inflation: greater frequencies of price changes, as well as larger absolute size of price changes.
- Higher variability should lead to more frequent price changes.
- Berka et al: Correlation between reference price change frequency and CPI inflation is -0.69 (or even -0.97, depending on the sample)



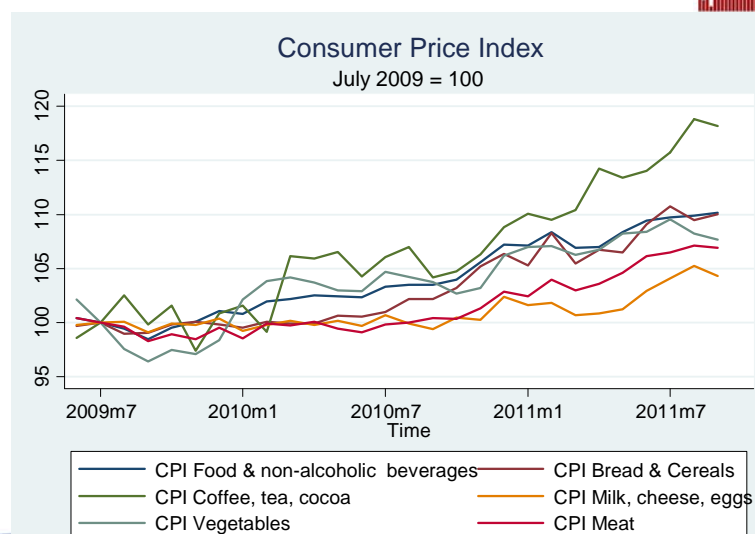


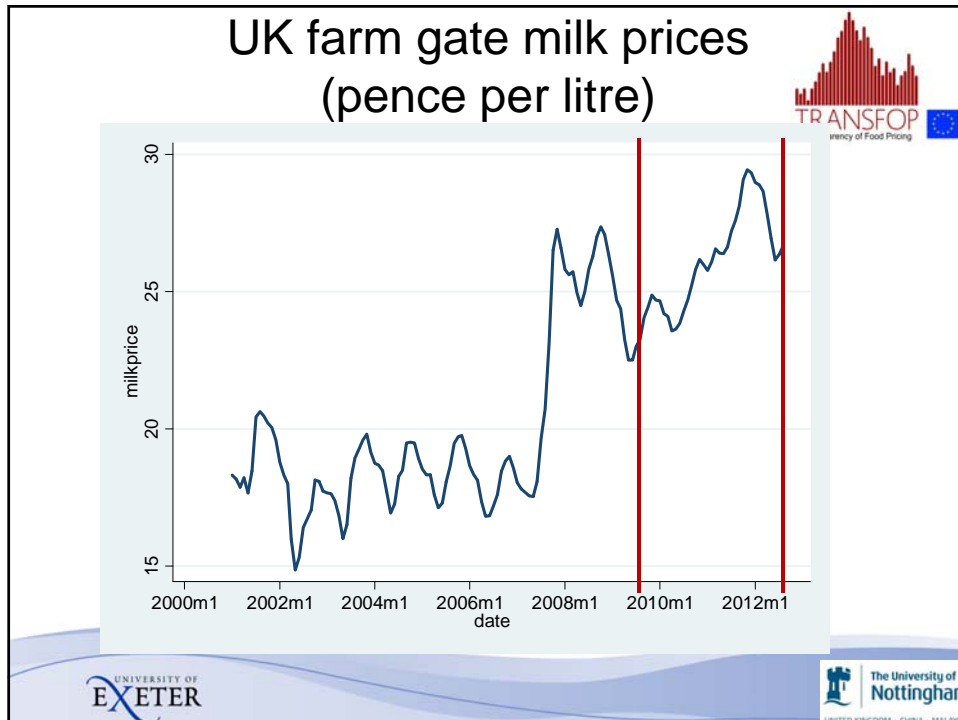
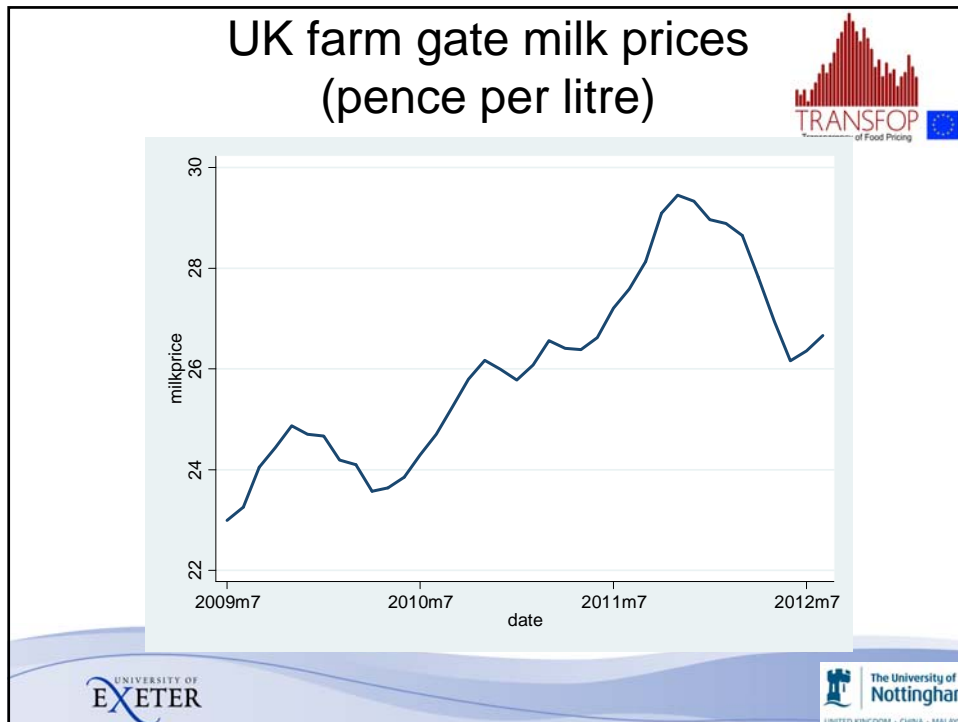
Scanner II

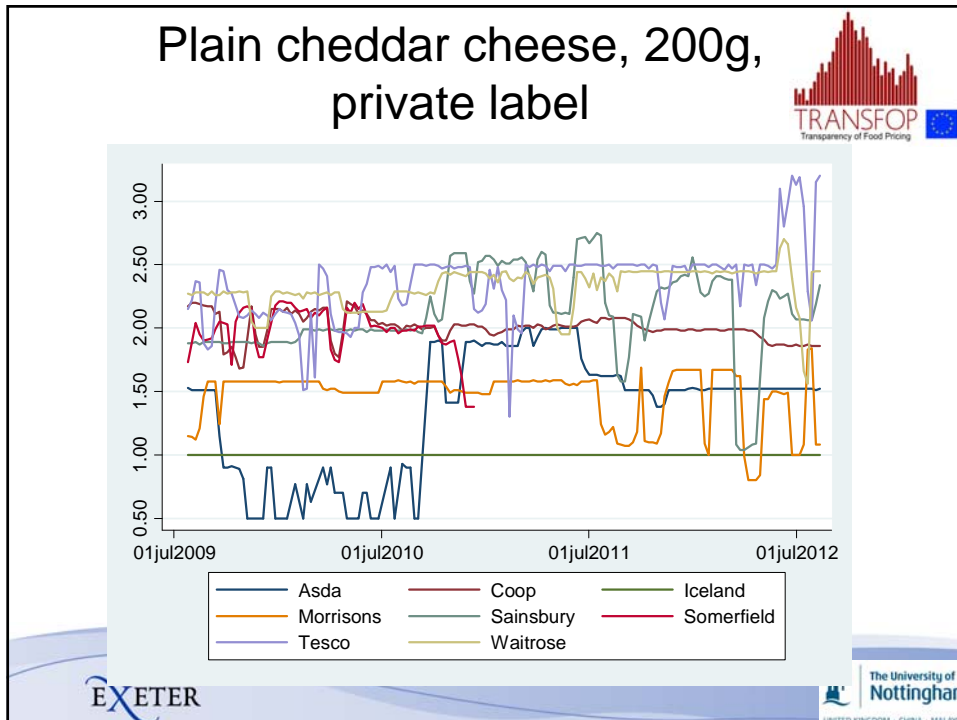
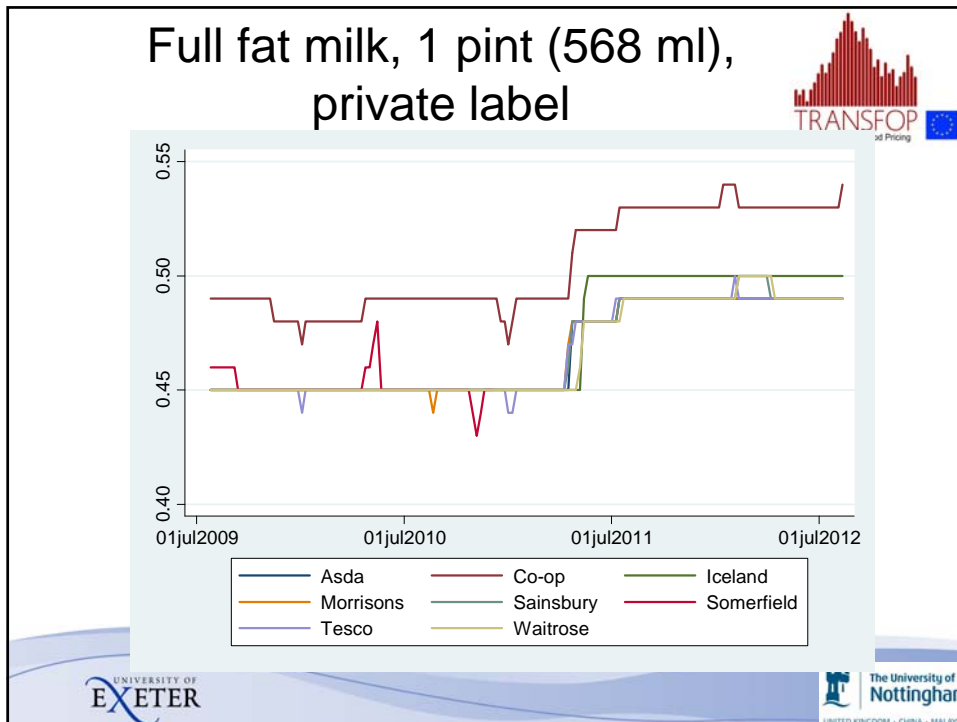


- Scantrak prices
 - All UK multiples (9 retailers)
 - Weekly data, 3 years (2009-2012)
 - Milk, cheese yoghurt
 - Coffee (instant, ground)
 - Orange juice (ambient, chilled)
 - Own label and brands

A different inflation environment







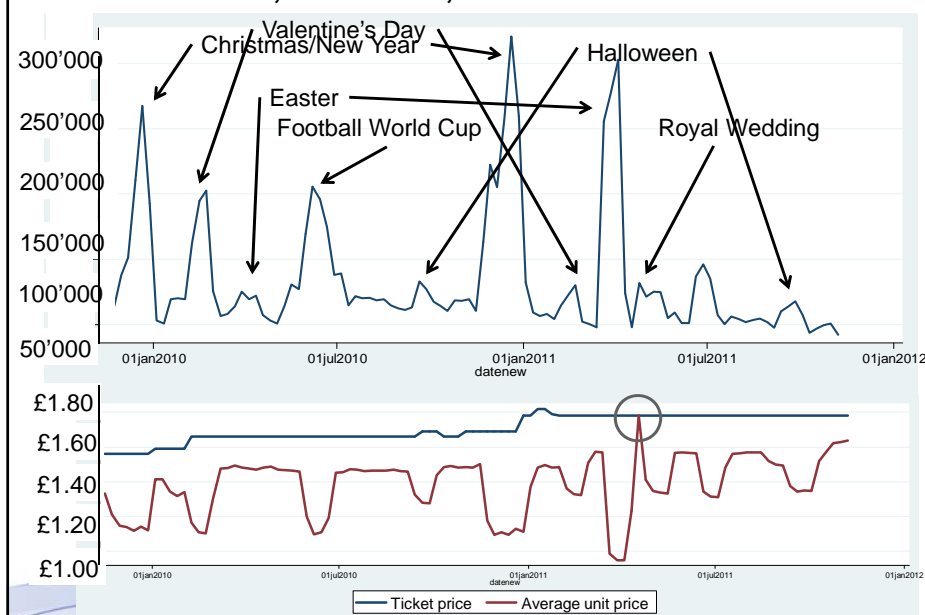
Tesco Clubcard data



- UK's largest retailer
- All sugary drinks, sugar and sugar substitutes
- ca 300 UPCs in the soft drinks category
- Prices and quantities from sample of 1.7m purchasers over last two years
- Detailed promotional information
- Clubcard holder profile information (lifestyle stages based on purchases; cameo geo-demographics)



Coca-Cola, 2l bottle, sold in London stores





Thank You

