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**Sales Prices, Replacement Prices and Trade Margins - Tracing price
changes through the UK retail sector**

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Sales Prices, Replacement Prices and Trade Margins - Tracing price changes through the UK retail sector¹

The retail and wholesale sector plays a unique role in the national system of price statistics as it applies several distinct sets of prices to items that are physically identical. Despite the unique problems of measurement this raises, the sector is increasingly important in modern economies. This paper lays out the theoretical framework for measuring trade margins and attempts to fit ONS' available data for values and prices of retailer's sales, stocks, and purchases -including imports- into an appropriate analytical framework.

The data presented suggest that double deflated estimates of trade margins are both more accurate and faster growing than single deflated estimates; that margins are determined by characteristics of the retailer rather than by the product being traded; and that this has important implications for statisticians measuring consumer prices and consumption.

Keywords: Prices, Retailing, Margins, PPI, CPI, Inventories

1. Introduction

One of the most fundamental facts of economics is that one pound, dollar, euro or yen is no different from another and so values can be directly compared and added in a way that quantities cannot. It is this “aggregatibility” that has allowed and encouraged National Accountants to develop a grand synthesis, the SNA, that is fully integrated but covers every transaction in the economy, often with information aggregated by the transactors themselves. Price statisticians face a much more difficult task. They must observe the values of a few selected potential transactions for which they judge the quantities offered to be equivalent and aggregate them to form indices, and they must do this in such a way that these indices are “representative” for their target users. Naturally they have taken a less universalist approach. Each group of analysts work on their own set of indices and attempts to use estimates from one area to improve those in another are rare.

Despite the relative isolation in which we work, all of us who compile and analyse price statistics are aware that prices behaviour in different parts of the economy are linked. The Bank of England, for instance, talks of a prices ‘pipeline’² in which “*For retailers, the price of an item will have to cover the cost of buying the goods from the producer, paying staff their wages and paying for other services required such as delivery, rents and electricity. A similar breakdown applies to producers. This will include the cost of materials and components that they purchase from other firms.*” Similar considerations are apparent in the Bureau of Labour Statistics’ stage of processing analysis. A recent paper by Fenwick³ advocates the use of frameworks derived from the SNA to integrate different price indices. This paper is an attempt to investigate these ideas more deeply and apply them to the main price indices relevant

¹ The author would like to thank ONS colleagues, in particular Jeff Cotis, Jan Davies, Di Preece, Joe Robjohns, Nick Palmer, Richard McCrae, and David Fenwick, and Gavin Wallis for assistance with data, advice, and comments. The views and expressed in this paper and the estimates presented are entirely the responsibility of the author and do not represent the opinions of the Office for National Statistics.

² See the reference at

http://www.bankofengland.co.uk/education/targettwopointzero/economy/costs_prices.htm

³ Fenwick UNECE May 2006 Systems of Price Indices and Supporting Frameworks

to retail trade margins. These margins are of great and increasing interest in their own right for estimating and explaining economic growth⁴ and are also of particular interest to consumer price statisticians because the sector is the source of most consumer prices. Finally the application of two sets of prices to the same set of physical objects presents a particular challenge for analysis.

This paper firstly addresses in more detail at what retail trade margins are and how they link retail prices and supply prices. Next we focus on the question of how they should best be measured in practise. We then go on to look at the evidence from the UK both at the level of compiled data series and information on individual retailers and see what conclusions we can draw. The final section considers any lessons for economic statisticians.

2. What are Trade Margins?

The SNA defines a trade margin as “*the difference between the actual or imputed price realized on a good purchased for resale and the price that would have to be paid by the distributor to replace the good at the time it is sold or otherwise disposed of.*” (SNA 1993). Note that it is the replacement price that is relevant rather than the cost at which the goods were purchased. The difference between the replacement price and the original price is a holding gain made up of a nominal gain due to the movement of the general price level and a real holding gain due to the rise in the relative price of the item being held.

The point is simple but appears to be widely ignored in the literature. Many commentators appear to believe in the idea of a prices ‘pipeline’ or of producer prices as a leading indicator of consumer prices implies a model of price formation in which retailers agree to purchase an item at a certain price and set a markup and the item is then sold to a consumer after a certain stable period⁵. If this markup were achieved it would include both the trade margin and a holding gain. However this model does not only ignore SNA definitions but the way large retailers actually behave. Large UK retailers commonly send out revised price lists to all their stores at end of each working day. These are applied to the prices on their shelves regardless of their original cost except for perishable goods where the lag between purchase and sales is likely to be small anyway. Their behaviour is perfectly rational. It makes no sense to sell an item that costs twenty pound to replace for ten pounds even if you originally bought it at two and hoped to sell it for three. An explanation for retailers following the pipeline model would have to contain some assertion that the transactions costs of changing price tickets were prohibitively high, that retailers lacked information about replacement prices and had to estimate them using past purchase prices, that there was some sort of implicit contract with consumers about the markup, or that retailers could predict movements in purchase prices and had target holding gains. In short, the use of producer prices as a leading indicator of retail prices, like any other leading

⁴ See Timmer Inklaar and Van Ark “Productivity differences in US and EU retailing, statistical myth or reality”

⁵ The idea of PPIs as a leading indicator also underlies past ONS work on price comparisons eg Richardson and Baxter - *PPI/RPI comparisons, economic trends August 1998*

indicator, requires some departure from fully rational behaviour and there is no evidence that retailers are particularly irrational in their price setting⁶.

The other important point about trade margins is that they are a payment for actual services such as gathering a particular range of goods together in the same place and providing a convenient place to shop with friendly, knowledgeable staff (see Eurostat manual on Prices and Volumes⁷). Unlike a flow actually *defined* as a residual, such as operating surplus, retail services could in principal be measured directly. In theory, an identical item could be sold in the same outlet in two different periods with two different quantities of trade services, perhaps due to the presence of better trained or friendlier staff. It is difficult, however, to see how this quantity change could be measured in practise.

The Eurostat handbook states that; “Statistical offices have so far used data on the volume of sales as indicators of the volume of trade services”. That is margins per unit of sales on a given type of transaction in a given outlet are assumed constant but differences in the average trade margin caused by moving sales from one outlet or product to another are allowed for.

Note that the constant margins per unit of sales assumption does not in itself allow us to link sales prices and replacement prices as the price of the trade services may vary. In order to make a link we must also assume the price of trade services varies with the price of sales, i.e. assume that changes to sales and replacement prices are equal. If we are prepared to do this we can show that the change in the sales price index is equal to the change in the replacement price index plus the following term:

$$(1) \quad \sum_{i=1}^N s_i^m (r_i - r^*) (\mu_i - \mu^*) + \mu^* \sum_{i=1}^N (s_i^m - s_i) (r_i - r^*)$$

Where $r_i \equiv \frac{p_i^t}{p_i^0} \mu_i \equiv \frac{m_i^t}{m_i^0}$, $r^* \equiv \sum_{i=1}^N s_i r_i$, $\mu^* \equiv \sum_{i=1}^N s_i^m \mu_i$ represent price relatives, margin changes, sales weighted price indices and margin weighted margin indices (see Annex 1 for a derivation)

The first term depends on the correlation of margin increases and price relatives. If margins per pound of sales are fixed for all transactions this term disappears and the difference between the indices is equal to the effect of using sales value weights as opposed to replacement value weights to measure price changes.

The volume of the margin itself can be measured in two ways; directly by constructing an index of sales volumes weighted by base period margin values

$$(2) \quad M_i^0 \sum_{i=1}^N s_i^{m,0} q_i^t / q_i^0$$

⁶Strictly speaking intermediate consumption is also valued at replacement cost and should not be a leading indicator either. It would be easier to make a case for a link between producer prices because wages are subject to long term contracts and in any case nominal wages are notoriously sticky

⁷ Eurostat Handbook on Price and Volume Measurement in National Accounts

or indirectly by subtracting current sales deflated to the base period sales prices from current replacement costs deflated to the base period replacement prices and making an index of the result.

$$(3) \quad R_i^t \sum_{i=1}^N s_i^{r,t} p_i^0 / p_i^t - B_i^t \sum_{i=1}^N s_i^t p_i^0 / p_i^t$$

Where $p_{r,i}^t$, p_i^t and q_i^t are sales prices, replacement prices and quantities and $v_i \equiv p_i q_i$ are values, $m_i^t = q_i^t (p_{r,i}^t - p_i^t)$ are margins shares $s_i^{m,t} = q_i^t (p_{r,i}^t - p_i^t) / \sum_{i=1}^N q_i^t (p_{r,i}^t - p_i^t)$, $s_i^{r,t} = q_i^t p_{r,i}^t / \sum_{i=1}^N q_i^t p_{r,i}^t$, and $s_i^t = q_i^t p_i^t / \sum_{i=1}^N q_i^t p_i^t$ are margin shares, sale price shares and replacement price shares and $M_i^t = \sum_{i=1}^N m_i^t$, $R_i^t = \sum_{i=1}^N q_i^t p_{r,i}^t$, and $B_i^t = \sum_{i=1}^N q_i^t p_i^t$ are total margin values, sales values and replacement values. We can easily see that these are equivalent (see (4)).

(4)	$M_i^0 \sum_{i=1}^N s_i^{m,0} q_i^t / q_i^0 = \sum_{i=1}^N q_i^t (p_{r,i}^0 - p_i^0) = \sum_{i=1}^N q_i^t p_{r,i}^0 - \sum_{i=1}^N q_i^t p_i^0$ $= R_i^0 \sum_{i=1}^N s_i^{r,0} q_i^t / q_i^0 - B_i^0 \sum_{i=1}^N s_i^0 q_i^t / q_i^0 = R_i^t \sum_{i=1}^N s_i^{r,t} p_i^0 / p_i^t - B_i^t \sum_{i=1}^N s_i^t p_i^0 / p_i^t$
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Note that whereas (2) requires us to measure the change in quantity for goods for transactions with each different base period margin rate separately (3) only requires the correct current sales and supply shares.

3 Measuring Trade Margins in Practise

Practical estimation of changes to economic volumes almost always involves deflating value changes by general purpose price indices weighted by base period sales. The practical estimators for estimators for (2) and (3) are given by (2a) and (3a)

$$(2a) \quad \sum_{j=1}^J m_j^0 (v_j^t / v_j^0) * (P_{ki \in j, Lo, x}^0 / P_{ki \in j, Lo, x}^t) \quad (3a) \quad \sum_{l=1}^L v_j^{r,t} (P_{li \in l, r, Lo, y}^0 / P_{li \in l, r, Lo, y}^t) - \sum_{o=1}^O v_l^t (P_{oi \in o, Lo, z}^0 / P_{oi \in o, Lo, z}^t)$$

In (2a) the i transactions are divided into J groups each containing K_j transactions for which we assume that sales weighted Laspeyres quantity indices are equal to margin weighted Laspeyres quantity indices and $P_{k \in j, B, Lo}^{b,t}$ is the estimated Lowe price index for group j at time t calculated using weights x and a set of prices j_i that fall in group J . In (3a) the sales and supply prices are grouped into L and O groups respectively.

Both estimates will be subject to the biases that arise from using Lowe price indices instead of Paache but (2a) will also be subject to an extra bias arising from the use of sales weighted indices at the lower level as opposed to margin weighted indices.

We can get an indication of the size of the different biases by applying the standard result that a price index weighted using quantities q_b is equal to one calculated using quantities q_a plus a term

$$(5) \quad \sum_{i=1}^N s_i^a (r_i - r^*) (t_i - t^*) / Q_{a,b}^L(p_0, q_a, q_b)$$

(A symmetrical result applies to quantity indices weighted using different sets of prices.)

Where t_i are quantity relatives q_i^b / q_i^a , s_i^a are value shares using the base prices, $Q_{a,b}^L(p_0, q_a, q_b)$ is the p_0 based quantity index from q_a to q_b , and r^* and t^* are price and quantity indices weighted using s_i^a .⁸

Applying (5) to (2a) gives us the following expressions for the use of sales as opposed to margin weights and Lowe rather than Paache indices respectively

$$(2b) \quad \sum_{k=1}^{K_j} s_{j,k}^0 \left((m_{k,j}^0 / p_{k,j}^0) - (m_j^0 / p_j^0)^* \right) \left((q_{k,j}^t / q_{k,j}^0) - (q_j^t / q_j^0)^* \right) / P_{r,j}^L(q_{j,k}^0, p_{j,k}^0, p_{r,j,k}^0);$$

and

$$v_j^{0,t} \sum_{k=1}^{K_j} s_j^t \left((p_{r,k,j}^0 / p_{r,k,j}^t) - (p_{r,k,j}^0 / p_{r,k,j}^t)^* \right) \left((q_{k,j}^b / q_{k,j}^t) - (q_j^b / q_j^t)^* \right) / Q_{t,b}^L(p_t, q_t, q_b)$$

Where q_i^b are the quantities in the base period used for the Lowe index.

The first term depends on the correlation of the difference between the margin on each transaction and the average margin for its group and the difference between the quantity of each transaction in the current period of the margin index relative to the quantity in the base period. The second term depends on the correlation between the deviation of the price in the base period of the margin index relative to the current period from its group average and the deviation of the quantity in the base period of the price index relative to the quantity in the current index relative to its group average

For (3a) there is only one formula bias term and it is net.

$$(3b) \quad \sum_{l=1}^L v_L^{r,t} \sum_{k=1}^{K_l} s_l^{r,t} \left((p_{r,k,l}^0 / p_{r,k,l}^t) - (p_{r,l}^0 / p_{r,l}^t)^* \right) \left((q_{k,l}^b / q_{k,l}^t) - (q_l^b / q_l^t)^* \right) / Q_{t,b}^L(p_{r,l}, q_l, q_b)$$

$$- \sum_{l=1}^O v_o^t \sum_{k=1}^{K_o} s_o^t \left((p_{k,o}^0 / p_{k,o}^t) - (p_o^0 / p_o^t)^* \right) \left((q_{k,o}^b / q_{k,o}^t) - (q_o^b / q_o^t)^* \right) / Q_{t,b}^L(p_t, q_t, q_b)$$

Both these terms take the same form as the second term in (2b). We know that the ratio of two sample Lowe price indices with pps sampling is equal to the ratio of the population Lowes plus a sampling error with an asymptotic expectation of 0 but a bias in small samples⁹. The variance of this error will of course depend on the sample size but may well be significant. If it is the mean square error of the biased single deflated estimate of a net variable, may well be smaller than a less biased double deflated

⁸ See annex A for a derivation

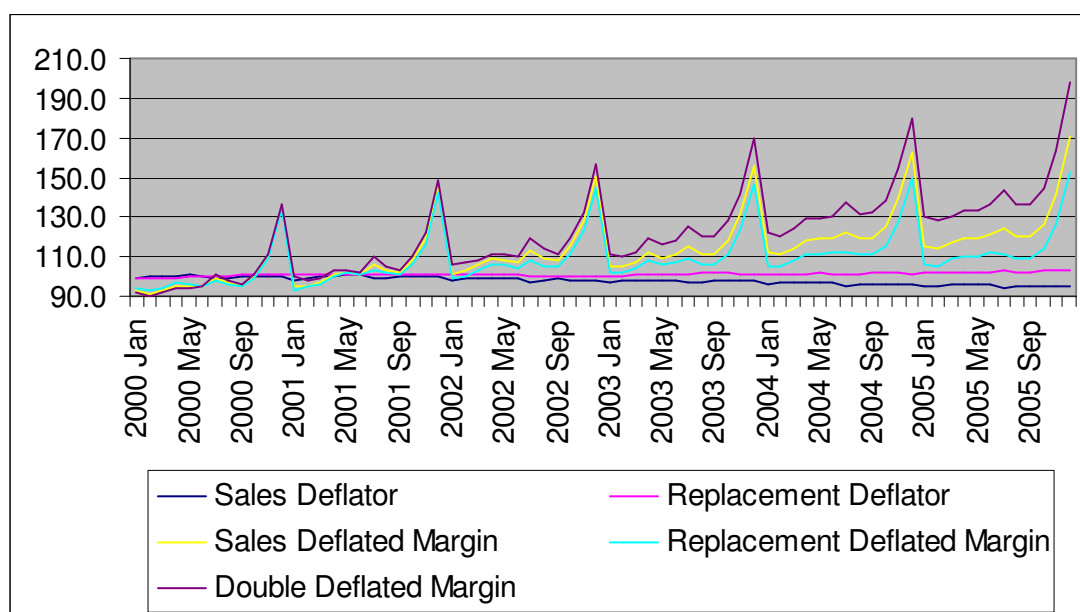
⁹ See Balk *Price Indices for Elementary Aggregates: The Sampling Approach*

estimate if the net variable is a small proportion of the gross as we know from Hill's classic discussion¹⁰

4 Evidence from UK data

ONS's principal indicator of retail activity is the Retail Sales Index (RSI). This survey produces current price estimates from a monthly turnover inquiry for 27 SIC(NACE) groups within retailing and deflators for 44 different COICOP groups that are traded calculated with data from the Retail Prices Index (RPI) collection. The measures are calculated using ratios from the 2000 Annual Business Inquiry (ABI). The RSI makes no attempt to measure double deflated trade margins or indeed to measure replacement costs at all. ONS does however produce indices of domestic producer and Import prices on a four digit SIC(NACE) basis that can be easily mapped to the RSI COICOP categories. Chart 1 shows the effect of applying these indices to the RSI's current price series.

Chart 1 Alternative Deflator and Margin Measures-2000-2005



Source Annex 4 Table 1

In essence, replacement prices have been growing faster than sales prices so current price margin series deflated with replacement prices grow more slowly than those deflated with sales prices and while double deflated series grow much faster.

¹⁰ T.P. Hill "The Measurement of Real Product" OECD February 1971

Table 1 Selected compiled data on Retail Trade Margins 1997-2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005
ABI Compiled Retail Output at basic prices as proportion of "adjusted" turnover	32.7	33.0	34.9	34.9	34.9	35.1	35.6		
Index of Sales Prices (RSI methods)	101.1	101.6	101.0	100.0	99.6	98.4	97.6	96.6	95.9
Index of Output Prices (RSI methodology)	99.6	100.4	100.3	100.0	100.9	101.2	102.2	103.3	103.8
Index of Import Prices (RSI methodology)	102.3	97.0	97.9	100.0	99.9	97.9	98.5	97.3	98.8
Retail Value Added at Current Prices (RSI)				49.5	52.3	54.9	56	58.6	59.1
Retail Value Added at 2000 Sales Prices (RSI)				49.5	52.5	55.7	57.3	60.8	61.9
Retail Value Added at 2000 Replacement Prices (RSI)				49.5	51.8	54.6	55.2	57.7	57.6

Table 1 shows an annual version of the same data with the price indices stretching back to 1997. This clearly shows that the pattern of sales prices growing more slowly than replacement prices has persisted as far back as 1997. Paradoxically however, the Annual Business Inquiry does not show any squeeze on current margins, if anything there has been a slight increase.

We can investigate this further by looking at the correlations between margins growth and price changes at the Industry level.

Table 2 Correlation between selected elements of the Retail Trade Margins based on 2000-2005

	A	B	C	D	E
Margin in 2000	A 1.00				
Growth in Quantities Deflated by Sales Deflator	B 0.10	1.00			
Growth in Quantities Deflated by Replacement Deflator	C 0.13	0.96	1.00		
Growth in Sales Deflator	D 0.03	-0.67	-0.47	1.00	
Growth in Replacement deflator	E -0.01	-0.65	-0.56	0.85	1.00

Source: Annex 4 Table 1

Note that these only correspond fully to the expressions in (2b) and (3b) if the SIC(NACE) groups are taken to represent the J,L, and O groups into which the transactions are divided. Leaving this caveat aside we can see that Margins are positively correlated with quantity growth while both sales and replacement deflators are more strongly negatively correlated and by approximately equal amounts. At first sight this would tend to suggest that (2b), the bias in the single deflated measure, should have a small positive term and a large negative term while the bias in the double deflated measure would be the difference of two large negative terms that would cancel out. On the whole then, our results suggest the double deflated measure should be more accurate and higher than the single deflated measure.

The compiled series are sufficient to tell us that double deflated trade margins in the UK grow faster than single deflated margins and may well be more accurate. However they cannot tell us anything about the feasibility of using supply prices to

inform measures of sales prices or vice versa or throw any light on the paradox that margins are rising in an environment that suggests they ought to be squeezed For that we need to look at micro-data.

The UK is fortunate in having data for many of its surveys contained in a virtual laboratory that allows researchers to examine the microdata behind them in a controlled environment untroubled by confidentiality issues. So far the laboratory contains the returns for the retail section of the Annual Business Inquiry from 1997-2003. This amounts to approximately 44 thousand records or just over six thousand a year of which just over 39 thousand contained enough information to create a feasible margin estimate. Each form contains sales broken down by commodity. Forms completed after 2000 use a breakdown corresponding to the 44 Coicop categories used for RSI deflation, however forms before 2000 use a different classification. The two classifications can be aggregated to arrive at a common, consistent classification with 28 categories. Tables 3-9 in annex 4 contain estimates calculated directly from this dataset. Table 3 below contains a summary.

Table 3 Selected results from ABI Panel

	1997	1998	1999	2000	2001	2002	2003	Total Or Average	Standard Deviation
Count of Retailers in ABI Sample	6017	5834	5418	5471	5623	5479	5378	39220	
Weighted Sales in current £Bn	165.09	161.47	178.03	202.23	206.85	220.61	210.94		
Margin as a % of Sales	35.64	35.29	35.98	34.89	35.43	35.86	38.57	35.99	1.12
Weighted Sales in deflated £Bn	165.22	160.11	175.71	202.24	206.87	222.2	214.44		
Constant Price Margin as a % of Sales	35.1	34.29	34.91	34.89	35.66	36.61	39.92	36.05	1.77
Sales Deflator	100	101	101	100	100	99	98		
Supply Deflator	99	99	100	100	100	100	101		

N.B. Margin is calculated as Sales +closing stocks-opening stocks-purchases with closing and opening stocks re-valued to current prices using replacement price indices. All price indices are weighted using the sales breakdown for that firm and year.

The data in table 3 show margin estimates that are higher than those in table 1 but slightly slower growing. The discrepancies in the level are likely to be due to slight differences between the Output and adjusted turnover reported in the ABI and the Margin/Sales estimates presented here (though the elimination of some of the firms may also have had an effect).

Perhaps the most interesting aspect of table 3 is the fact that the sales and supply deflator are much closer together when they are calculated using the sales breakdown for each firm in each year. However we still have the paradox that margins are rising despite sales prices that are still rising more slowly than supply deflators.

The answer to the paradox is revealed by the regressions presented in Annex 5 which demonstrate clearly that *a retail enterprises' trade margin is not determined by the coicop commodity it is trading or the SIC(NACE) category to which it belongs but by other factors peculiar to the firm.* This is seen most clearly in the fixed effects panel regression **R4**, which shows firm specific effects explaining 89% of the variation in

margin in the sample, but also emerges from every other analysis. There may be underlying factors, possibly market power or location, that explain trade margins but commodity splits do not. *Average trade margins for a SIC(NACE) or commodity group are stable only to the extent that the distribution of sales between firms within that industry or commodity group are stable.* Even small changes in the distribution of sales between enterprises will cause the margin to vary with adverse consequences for measuring trade margins by either single or double deflation or matching sales and supply prices.

Although the regressions in Annex 5 do not explain what does determine the trade margin it appears quite possible that it is simply a branding effect. “Good” shops are able to charge higher margins because customers receive an inherent satisfaction from shopping there. It would be interesting to explore if “good” shops with high margins also enjoyed a higher return on capital or whether the extra margin is absorbed in the cost of providing this service to the consumer. In either case, providing it is likely to be a fixed cost and we might therefore expect it to get cheaper as sales rise. The fact that the constant price margin in Table 3 rises faster than the current price margin is not conclusive but definitely worth noting.

5. Conclusions and Implications for price and volume Measurement in the retail sector

This paper has two types of conclusions.

In the short term it demonstrates that double deflated estimates of UK retail services might be both more accurate and growing at least 2% a year faster than single deflated estimates. As the wholesale and retail sector accounts for about 10% of output this difference would, all else being equal and if the results hold for wholesale as well as retail trade, add about 0.2% a year to economic growth. This finding provides added reinforcement for the ONS’ decision to move to double deflated estimates for its National Accounts in Blue Book 2009.

More interesting long term questions are raised by the realisation that this extra output is, inevitably, going to consumers. When up to a third of consumers’ expenditure on goods (far more in some cases) pays for trade services, and about half of all consumer expenditure is on goods, the growth in household consumption will be heavily influenced by their consumption of trade services. As Annex 5 shows these trade services are determined more by *where* people buy than what they buy. To capture this statisticians measuring household consumption, and indeed those measuring retail sales, would have to start stratifying retailers using their margin rate as well as their sic(nace) code and employment size.

An additional benefit, if retail sales statisticians were able to do this, would be that it would be possible to strip out the effects of changing shopping patterns and allow better comparisons between consumer, producer, and import prices. However this will be difficult to do in practise without using a framework of the sort shown in Annex 3.

The results also have direct implications for consumer price statisticians. If margins are fixed characteristics of certain shops produced by fixed costs in those shops then we would expect high and low margin shops to react differently to changes in supply price. It therefore becomes important that the consumer price index collection is

spread appropriately. We should also consider the appearance of a new shop as the appearance of a new good on the market and treat it accordingly.

Annex 1 Difference between CPI and PPI with changing margin (derived from CPI manual Section 15.2)

Consider two price indices with different with different bases. Let q^a indicate quantities in period **a** and q^b quantities in period **b**. define retail price = margin times supply price = $m^t_n * p^t_n$

$$r_i \equiv \frac{p_i^t}{p_i^0} t_i \equiv \frac{q_i^t}{q_i^0}, \mu_i \equiv \frac{m_i^t}{m_i^0}, v_i \equiv p_i q_i, s_i = v_i^0 / \sum_{i=1}^N v_i^0, s_i^m = m_i^0 v_i^0 / \sum_{i=1}^N m_i^0 v_i^0, r^* \equiv \sum_{i=1}^N s_i r_i, \mu^* \equiv \sum_{i=1}^N s_i^m \mu_i$$

The price Index of price change from p^0 to p^t with base quantities **b** is given by

$$\begin{aligned} \text{Or CPI} &= \frac{\sum_{i=1}^N p_i^t m_i^t q_i^0}{\sum_{i=1}^N p_i^0 m_i^0 q_i^0} = \sum_{i=1}^N s_i^m (p_i^t m_i^t / p_i^0 m_i^0) = \sum_{i=1}^N s_i^m r_i \mu_i \\ &= \sum_{i=1}^N s_i^m (r_i - r^*) \mu_i + r^* \sum_{i=1}^N s_i^m \mu_i \\ &= \sum_{i=1}^N s_i^m (r_i - r^*) (\mu_i - \mu^*) + \mu^* \sum_{i=1}^N s_i^m (r_i - r^*) + r^* \mu^* \\ &= \sum_{i=1}^N s_i^m (r_i - r^*) (\mu_i - \mu^*) + \mu^* \sum_{i=1}^N (s_i^m - s_i) (r_i - r^*) + \mu^* \left[\sum_{i=1}^N r_i s_i - r^* \sum_{i=1}^N s_i \right] + r^* \mu^* \\ &= r^* \mu^* + \sum_{i=1}^N s_i^m (r_i - r^*) (\mu_i - \mu^*) + \mu^* \sum_{i=1}^N (s_i^m - s_i) (r_i - r^*) \end{aligned}$$

Or the PPI Index * the change in the margin weighted by base period sales at consumer prices plus the weighted correlation between price relatives at supply prices and margin relatives plus another term that depends on the difference in the base period margins.

Annex 2 Difference between two Lowe price indices with different base weights (derived from CPI manual Section 15.2)

Consider two Lowe price indices with different with different bases. Let q^a indicate quantities in period **a** and q^b quantities in period **b**. define

$$r_i \equiv \frac{p_i^t}{p_i^0}, t_i \equiv \frac{q_i^b}{q_i^a}, P_{0,t}^{aLo}(p_0, p_t, q_a) = r^* = \sum_{i=1}^N r_i s_i^a \quad \text{and} \quad Q_{a,b}^{0Lo}(p_0, q_a, q_b) = t^* = \sum_{i=1}^N t_i s_i^a$$

where $s_i^a = p_i^0 q_i^a / \sum_{i=1}^N p_i^0 q_i^a$ or the quantity shares of period a valued at the prices of period 0.

The Lowe price Index of price change from p^0 to p^t with base quantities b is given by

$$\begin{aligned} P_{0,t}^{bLo}(p_0, p_t, q_b) &= \frac{\sum_{i=1}^N p_i^t q_i^b}{\sum_{i=1}^N p_i^0 q_i^b} = \frac{\sum_{i=1}^N p_i^t t_i q_i^a}{\sum_{i=1}^N p_i^0 t_i q_i^a} = \\ &= \frac{\left[\frac{\sum_{i=1}^N p_i^t t_i q_i^a}{\sum_{i=1}^N p_i^0 q_i^a} \right] \left[\frac{\sum_{i=1}^N p_i^0 t_i q_i^a}{\sum_{i=1}^N p_i^0 q_i^a} \right]^{-1}}{\left[\frac{\sum_{i=1}^N (p_i^t / p_i^0) t_i p_i^0 q_i^a}{\sum_{i=1}^N p_i^0 q_i^a} \right]} \Bigg/ t^* = \frac{\left[\frac{\sum_{i=1}^N r_i t_i p_i^0 q_i^a}{\sum_{i=1}^N p_i^0 q_i^a} \right]}{t^*} \\ &= \frac{\sum_{i=1}^N r_i t_i s_i^a}{t^*} = \frac{\sum_{i=1}^N (r_i - r^*) t_i s_i^a}{t^*} + \frac{r^* \sum_{i=1}^N t_i s_i^a}{t^*} = \frac{\sum_{i=1}^N (r_i - r^*) t_i s_i^a}{t^*} + \frac{r^* t^*}{t^*} \\ &\quad \text{(take } r^* \text{ away then add it, split summation, and use } t^* = \sum_{i=1}^N t_i s_i^a \text{)} \\ &= \frac{\sum_{i=1}^N (r_i - r^*) (t_i - t^*) s_i^a}{t^*} + \frac{\sum_{i=1}^N (r_i - r^*) t_i^* s_i^a}{t^*} + r^* \\ &\quad \text{(same trick with } t \text{ rather than } r \text{)} \\ &= \frac{\sum_{i=1}^N (r_i - r^*) (t_i - t^*) s_i^a}{t^*} + \frac{t_i^* \left[\sum_{i=1}^N (r_i s_i^a) - r^* \sum_{i=1}^N (s_i^a) \right]}{t^*} + r^* \\ &\quad \text{but sum of } s_i^a = 1 \text{ and } P_{0,t}^{aLo}(p_0, p_t, q_a) = r^* = \sum_{i=1}^N r_i s_i^a \text{ so } [] \text{ term} = 0 \\ &= r^* + \frac{\sum_{i=1}^N (r_i^0 - r^*) (t_i^0 - t^*) s_i^a}{t^*} = P_{0,t}^{aL}(p_0, p_t, q_a) + \frac{\sum_{i=1}^N (r_i^0 - r^*) (t_i^0 - t^*) s_i^a}{Q_{0,b}^L(p_0, q_a, q_b)} \end{aligned}$$

Or the Lowe Index of price changes from time 0 to time t with base quantities **a** plus the weighted covariance of the relative price between p^0 and p^t and the relative quantity changes between q^a and q^b divided by the Lowe index of changes between quantities a and quantities b with the base prices of time 0.

Annex 3 Social Accounting Matrix Structure for Retail Sector

While retail sales and prices are fairly well defined replacement prices are a more difficult concept. Replacement costs will be determined by import prices, taxes and transport costs as well as producer prices, and the total return to retailers will depend on stock revaluation. This makes it especially advantageous to analyse retail and supply prices within the sort of framework proposed in Fenwick 2006.

This Annex is an attempt to show the variables involved in measuring the retail sector in a Social Accounting Matrix or SAM. SAMs are square sets of economic accounts in which each pair of rows and columns represents a single account. The entries in each cell show the payments made by the account at the top of the column to the account in the row. As the accounts are balanced the sum of entries for each row equals the sum for each the corresponding column¹¹. Account 8¹² for instance shows the balance between retail sales and closing stocks at current cost and retail purchases, opening stocks and the trade margin for each SIC(NACE) group.

One feature of a SAM framework is that it allows for multiple sectoring to accommodate any classification. Cell 8,7 for example shows a matrix of retail sales classified by the standard industrial classification of the retailer and COICOP while cell 7,1 shows the same data classified by coicop and the RPI item classification. By showing the links back to the elementary index level for each flow we can use the framework to analyse the relationship between the different price indices and identify the contradictions inherent in the assumptions used to compile them. These assumptions are inevitable due to the lack of detailed data to fill the body of each matrix as opposed to the border totals is never available on a timely basis. To see how this works in practise consider 8,7 . The body of the cell is determined by the retail price index team's assumption that current the proportion of each sic(nace) classification's sales by different Coicop groups is fixed. Given the current values of sales by SIC(NACE) and the coicop price changes this fixes the relative quantities in each Coicop group. However the RPI assumes that the relative quantities of each coicop group are fixed.

A completely coherent set of price indices will require completely balanced current and constant price SAMs.

¹¹ more details on SAMs can be found in the 1993 SNA or Pyat and Round, 1980, Social Accounting Matrices for Development Planning.

¹² For simplicity's sake we assume all retail sales are made to consumers.

Annex 3 Social Accounting Matrix Structure for Retail Sector

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		CPI	PPI	IPI	PPI	PPI	Inv * SIC	COICOP	SIC	COICOP	CPA	CPA	Inv * SIC	Inv * SIC		
Sales by CPI elementary Item	1	ppi														financing of purchases
Domestic Purchases by PPI elementary Item	2	ppi									Domestic Purchasers CPA * PPI					<i>PPI elementary Items</i>
Imported Purchases by IPI elementary Item	3	IPI										Import Purchases CPA*IPI				<i>IPI elementary Items</i>
Inventories by PPI opening cp	4	ppi											opening stocks at current cost PPI*Inv*SIC			<i>PPI elementary Items</i>
Inventories by PPI closing cp	5	ppi					Closing stocks historic PPI * Inv *SIC									reevaluation of closing stocks
Inventories at historic cost	6	Inv * SIC				Opening stocks historic Inv *SIC* PPI										
Sales (coicop)	7	COICOP	Retail Sales Coicop *CPI													
Retailers Trading Accounts (SIC)	8	sic						Retail Sales SIC*COICOP							Stocks at current cost SIC*Inv*SIC	
Purchases (Coicop)	9	COICOP							Purchases Coicop*SIC							
Manufacturers and wholesalers (PPIs)	10	CPA								Domestic Purchases CPA*Coicop						
Rest of the World (Import PPIs)	11	CPA								Purchases from Imports CPA*Coicop						
Inventories Opening by Inventories Classification	12	Inv * SIC							Opening stocks at current cost Inv*SIC*SIC							
Inventories Closing by Inventories Classification	13	Inv * SIC					closing stocks at current cost Inv*SIC*PPI									
Indirect Tax	14							Taxes on Margins			Taxes on Production	Taxes on Imports				
Institutions	15		return to domestic suppliers	return to overseas suppliers	reevaluation of openstocks		Stock Change (historic)		Retailers Trade Margin						Total Tax	

CPI item deflators

ppi lagged to opening PPI

Annex 4 – Selected information on UK Retail and Supply Prices.

**Table 1 – Alternative Deflators and Margin Indices 2000-2005
(Average 2000 =100)**

	Sales Deflator	Replacement Deflator	Sales Deflated Margin	Replacement Deflated Margin	Double Deflated Margin
2000 Jan	99.0	98.7	92.6	94.0	91.7
2000 Feb	99.7	99.0	91.0	92.5	89.6
2000 Mar	99.9	99.4	93.1	94.1	92.2
2000 Apr	100.3	99.3	95.3	97.2	93.5
2000 May	100.6	99.9	95.1	95.9	93.7
2000 Jun	100.2	100.1	95.0	95.5	94.7
2000 Jul	98.8	100.0	99.4	97.9	101.5
2000 Aug	99.1	100.2	97.0	96.3	98.5
2000 Sep	100.3	100.8	95.2	94.8	95.9
2000 Oct	100.3	100.7	100.4	99.2	101.2
2000 Nov	100.6	100.9	110.3	108.8	110.9
2000 Dec	100.6	100.8	135.5	133.9	136.5
2001 Jan	98.4	101.1	95.5	93.2	100.0
2001 Feb	99.3	101.2	95.1	94.5	98.0
2001 Mar	100.2	101.5	96.8	96.3	99.0
2001 Apr	100.0	101.4	100.9	99.9	103.4
2001 May	100.8	101.5	102.3	101.6	103.5
2001 Jun	100.7	101.5	101.1	100.9	102.1
2001 Jul	98.8	101.1	106.0	103.3	110.1
2001 Aug	99.4	100.7	102.9	101.6	105.1
2001 Sep	100.2	100.7	102.6	101.6	103.4
2001 Oct	99.8	100.9	108.1	105.9	110.2
2001 Nov	99.8	101.1	119.5	116.0	122.4
2001 Dec	100.1	100.8	145.5	142.0	148.4
2002 Jan	98.5	101.3	101.3	98.8	106.3
2002 Feb	98.9	101.1	102.9	100.6	106.7
2002 Mar	99.5	101.2	105.7	103.4	108.6
2002 Apr	99.1	100.6	108.8	106.0	111.6
2002 May	99.2	100.6	108.3	106.0	111.1
2002 Jun	98.6	100.7	106.7	103.8	110.6
2002 Jul	97.4	100.4	112.9	107.9	118.9
2002 Aug	97.6	100.4	108.8	104.6	114.4
2002 Sep	98.7	100.4	108.1	104.9	111.6

2002 Oct	98.5	100.2	115.3	110.8	119.2
2002 Nov	98.5	100.2	128.0	122.8	132.7
2002 Dec	98.5	100.2	150.5	144.5	157.0
2003 Jan	97.0	100.1	105.2	101.6	111.4
2003 Feb	98.0	100.6	104.8	102.2	109.7
2003 Mar	98.5	101.1	107.0	103.9	112.2
2003 Apr	98.0	101.3	112.1	108.0	119.1
2003 May	98.2	101.2	109.6	105.8	115.8
2003 Jun	97.7	101.1	111.4	107.2	118.4
2003 Jul	96.7	101.5	115.2	108.8	125.6
2003 Aug	97.3	101.6	110.8	105.8	119.9
2003 Sep	97.9	101.9	111.6	106.1	119.9
2003 Oct	97.8	101.9	118.5	111.6	127.9
2003 Nov	97.8	101.6	131.5	123.4	141.7
2003 Dec	97.8	101.6	155.7	146.4	169.3
2004 Jan	96.4	101.4	111.7	105.1	122.4
2004 Feb	96.7	101.0	111.0	105.5	119.8
2004 Mar	96.9	101.4	114.3	107.7	123.9
2004 Apr	96.8	101.3	118.7	111.6	128.9
2004 May	96.9	101.8	118.8	111.3	129.5
2004 Jun	96.6	101.5	119.5	111.8	130.6
2004 Jul	95.3	101.5	122.6	112.6	136.9
2004 Aug	95.7	101.6	118.9	110.9	131.7
2004 Sep	96.3	101.9	119.7	110.9	132.5
2004 Oct	96.3	101.9	125.2	115.3	138.4
2004 Nov	96.3	101.8	139.4	127.6	154.6
2004 Dec	96.4	101.3	162.4	149.9	180.0
2005 Jan	95.0	101.7	115.4	106.5	130.4
2005 Feb	95.2	102.1	114.4	105.5	128.7
2005 Mar	96.0	101.9	117.6	109.3	130.5
2005 Apr	95.6	101.8	119.6	110.2	133.3
2005 May	95.7	102.2	119.6	110.3	133.7
2005 Jun	95.6	102.3	121.4	111.9	135.9
2005 Jul	94.4	102.9	123.9	111.7	143.0
2005 Aug	94.6	102.2	120.1	109.5	136.5
2005 Sep	95.0	102.4	120.1	109.5	136.6
2005 Oct	95.0	102.6	126.7	114.1	144.8
2005 Nov	95.0	103.0	141.6	126.1	163.4
2005 Dec	95.4	102.9	170.8	152.8	197.7

Table 2 Selected RSI data for monthly estimates 2000-2005

SIC(NACE)	SIC(NACE) Description	2000 Margin	Average Growth in Quantities Deflated by Sales Deflator ¹³	Average Growth in Quantities Deflated by Replacement Deflator	Average Growth in Sales Deflator	Average Growth in Replacement deflator
52110	Non Specialised Stores With Alcohol Licence	28%	0.4%	0.4%	0.04%	0.09%
52120	Non Specialised Stores Without Alcohol Licence	34%	0.4%	0.3%	-0.11%	0.01%
52210	Fruit And Vegetables	35%	-0.1%	-0.1%	0.12%	0.09%
52220	Meat And Meat Products	43%	0.1%	0.1%	0.11%	0.12%
52230	Fish, Crustaceans And Molluscs	38%	-0.4%	-0.4%	0.07%	0.04%
52240	Bread, Cakes, Flour Confectionery And Sugar Confectionery	80%	-0.1%	-0.1%	0.14%	0.12%
52250	Alcoholic And Other Beverages	15%	-0.2%	-0.3%	0.07%	0.12%
52260	Tobacco Products	18%	-1.2%	-1.2%	0.24%	0.28%
52270	Other Food, Beverages And Tobacco Specialised Stores	35%	-0.3%	-0.3%	0.13%	0.11%
52310	Dispensing Chemists	25%	-0.4%	-0.3%	0.00%	-0.02%
52320	Medical Equipment	98%	0.2%	0.2%	0.15%	0.09%
52330	Cosmetic And Toilet Articles	38%	0.6%	0.6%	-0.02%	0.04%
52410	Textiles	44%	0.2%	0.1%	-0.06%	-0.01%
52420	Clothing	40%	0.8%	0.6%	-0.23%	-0.04%
52430	Footwear	41%	0.4%	0.4%	-0.07%	-0.02%
52440	Furniture, Lightg Equipment And Household Articles Not Elsewhere Classified	39%	0.1%	0.1%	0.12%	0.05%
52450	Electrical Household Appliances And Radio And Television Goods	30%	0.8%	0.3%	-0.73%	-0.22%
52460	Hardware, Paints And Glass	38%	0.5%	0.3%	-0.03%	0.14%
52470	Books, Newspapers, Stationery	33%	0.1%	0.1%	0.12%	0.09%
52481	Floor Covergs	42%	0.1%	0.2%	0.19%	0.00%
52482	Photography and Computing	60%	0.9%	0.7%	-0.39%	-0.14%
52489	Other Specialised Stores Not Elsewhere Classified	41%	0.6%	0.5%	-0.04%	0.07%
52500	Antiques, Including Antique Books	55%	-0.4%	-0.4%	0.06%	0.06%
52610	Mail Order Houses	47%	0.4%	0.1%	-0.38%	-0.08%
52620	Stalls And Markets	28%	-0.6%	-0.7%	0.05%	0.09%
52630	Other Non-Store	67%	0.2%	0.1%	-0.01%	0.11%
52700	Repairers	146%	-0.1%	-0.1%	-0.01%	0.06%
	Totals	35%	0.44%	0.32%	-0.08%	0.03%

¹³ Produced by deflating RSI Monthly Non Seasonally Adjusted Value Added Series (Sales/Value added ratio is assumed fixed in RSI Methodology)

Table 3 Count of Retailers in ABI Sample

	1997	1998	1999	2000	2001	2002	2003	Total
Non Specialised Stores With Alcohol Licence	457	689	618	621	633	630	629	4277
Non Specialised Stores Without Alcohol Licence	320	328	294	311	329	304	309	2195
Fruit And Vegetables	150	124	122	145	139	125	116	921
Meat And Meat Products	207	311	233	242	237	208	213	1651
Fish, Crustaceans And Molluscs	37	32	44	28	41	35	31	248
Bread, Cakes, Flour Confectionery And Sugar Confectionery	53	119	105	96	123	86	89	671
Alcoholic And Other Beverages	94	107	139	111	108	111	110	780
Tobacco Products	157	285	200	214	220	199	188	1463
Other Food, Beverages And Tobacco	160	173	158	128	136	136	122	1013
Dispensing Chemists	272	330	289	286	306	278	282	2043
Medical Equipment	59	54	53	50	58	65	69	408
Cosmetic And Toilet Articles	66	76	88	82	80	90	84	566
Clothing and Textiles	741	565	504	536	508	542	515	3911
Footwear	364	364	378	333	373	356	317	2485
Furniture, Lights and other Household Articles	340	252	220	221	233	220	204	1690
Electrical Household Appliances And Radio And Television Goods	213	188	155	175	173	163	169	1236
Hardware, Paints And Glass	206	306	293	301	351	330	319	2106
Books, Newspapers And Stationery	67	72	82	71	72	79	71	514
Floor Covergs	322	119	138	156	160	129	24	1048
Photographic,Computing, and Telecomms equipments	822							822
Other Specialised Stores	115	63	68	81	82	81	78	568
Secondhand Shops and Antiques, Including Antique Books	619	1086	995	1038	1017	1040	1178	6973
Mail Order Houses	50	31	38	38	33	28	26	244
Other Non-Store	92	106	136	137	130	148	149	898
Repairers	34	54	68	70	81	96	86	489
Total	6017	5834	5418	5471	5623	5479	5378	39220

Table 4 weighted Sales in current £Bn

	1997	1998	1999	2000	2001	2002	2003	Total	Right
Non Specialised Stores With Alcohol Licence	63.37	59.94	63.82	76.46	79.88	84.55	69.32	497.33	
Non Specialised Stores Without Alcohol Licence	15.08	16.68	17.98	19.39	19.18	20.48	20.69	129.47	
Fruit And Vegetables	1.05	0.99	0.95	1.18	0.98	0.88	0.93	6.97	
Meat And Meat Products	2.10	1.95	2.06	1.89	1.90	1.84	1.99	13.73	
Fish, Crustaceans And Molluscs	0.15	0.18	0.32	0.24	0.19	0.23	0.15	1.45	
Bread, Cakes, Flour Confectionery And Sugar Confectionery	0.52	0.54	0.51	0.65	0.63	0.67	0.54	4.06	
Alcoholic And Other Beverages	3.21	1.80	3.51	3.49	3.45	3.33	3.08	21.87	
Tobacco Products	2.02	2.60	2.25	2.04	2.11	1.71	1.76	14.49	
Other Food, Beverages And Tobacco	1.10	1.11	0.99	1.25	1.30	1.54	1.49	8.78	
Dispensing Chemists	5.18	5.65	6.11	6.65	7.04	7.26	8.12	46.02	
Medical Equipment	1.78	1.59	1.63	1.51	1.77	1.90	2.26	12.45	
Cosmetic And Toilet Articles	0.57	0.49	0.61	0.75	0.81	0.91	1.16	5.30	
Clothing and Textiles	20.89	20.89	22.25	24.45	22.53	27.73	30.45	169.17	
Footwear	6.27	6.54	8.22	7.78	8.85	10.19	9.32	57.17	
Furniture, Lights and other Household Articles	7.97	4.60	9.17	10.36	11.04	7.15	6.27	56.57	
Electrical Household Appliances And Radio And Television Goods	6.59	7.57	8.06	9.23	10.05	10.81	11.66	63.96	
Hardware, Paints And Glass	4.24	4.34	4.19	4.18	5.07	5.08	5.32	32.41	
Books, Newspapers And Stationery	1.31	1.64	1.80	1.67	1.88	2.02	2.17	12.50	
Floor Covergs	2.69	2.10	2.35	3.66	3.37	2.77	0.86	17.80	
Photographic, Computing, and Telecomms equipments	5.19	-	-	-	-	-	-	5.19	
Other Specialised Stores	1.87	1.16	1.35	1.86	2.03	1.96	2.39	12.63	
Secondhand Shops and Antiques, Including Antique Books	9.82	17.11	17.95	21.30	20.64	25.14	28.35	140.31	
Mail Order Houses	0.26	0.12	0.21	0.36	0.21	0.22	0.33	1.70	
Other Non-Store	1.73	1.60	1.43	1.55	1.38	1.67	1.75	11.10	
Repairers	0.16	0.28	0.31	0.31	0.57	0.57	0.57	2.77	
Total	165.09	161.47	178.03	202.23	206.85	220.61	210.94		

Table 5 Margin as a % of Sales

	1997	1998	1999	2000	2001	2002	2003	Average	Standard Dev
Non Specialised Stores With Alcohol Licence	24.98	22.86	22.72	22.09	21.63	21.28	23.76	22.65	1.19
Non Specialised Stores Without Alcohol Licence	41.66	44.36	44.01	40.23	42.32	43.01	45.74	43.08	1.70
Fruit And Vegetables	30.50	32.08	30.56	29.88	29.36	34.49	29.13	30.79	1.74
Meat And Meat Products	33.13	34.78	34.82	33.28	33.65	32.85	32.21	33.54	0.90
Fish, Crustaceans And Molluscs	30.63	32.97	37.56	36.97	33.47	31.07	34.74	34.33	2.49
Bread, Cakes, Flour Confectionery And Sugar Confectionery	51.96	50.37	50.70	44.22	50.67	49.70	43.42	48.63	3.17
Alcoholic And Other Beverages	29.23	28.99	27.45	29.18	29.99	32.78	29.45	29.61	1.49
Tobacco Products	24.27	23.97	24.38	22.90	23.78	22.79	26.05	24.01	1.01
Other Food, Beverages And Tobacco	28.67	30.92	32.19	32.38	35.69	36.99	38.86	34.11	3.35
Dispensing Chemists	27.01	25.33	24.55	24.89	25.22	24.50	24.46	25.05	0.83
Medical Equipment	45.20	43.00	46.65	47.71	41.80	38.73	36.62	42.38	3.79
Cosmetic And Toilet Articles	48.34	52.00	49.53	51.24	56.48	53.14	49.00	51.44	2.61
Clothing and Textiles	45.73	44.87	47.37	48.71	50.67	50.09	52.29	48.82	2.50
Footwear	44.99	45.99	47.48	46.80	49.12	50.26	48.86	47.92	1.73
Furniture, Lights and other Household Articles	36.37	39.67	39.55	38.31	41.48	38.55	39.31	39.11	1.44
Electrical Household Appliances And Radio And Television Goods	46.45	49.46	52.26	48.92	48.67	49.44	49.68	49.34	1.58
Hardware, Paints And Glass	36.57	36.10	38.56	37.29	41.99	41.69	43.12	39.58	2.67
Books, Newspapers And Stationery	51.28	48.84	47.72	45.81	52.58	50.24	52.35	49.93	2.32
Floor Coverings	59.66	53.02	48.49	46.53	48.58	48.25	37.27	49.74	6.26
Photographic, Computing, and Telecomms equipments	44.67							44.67	
Other Specialised Stores	54.14	49.15	52.99	54.54	55.48	58.17	58.96	55.37	3.05
Secondhand Shops and Antiques, Including Antique Books	49.80	45.85	47.26	46.61	46.26	48.33	48.69	47.50	1.34
Mail Order Houses	32.65	40.33	31.74	27.74	34.07	35.60	43.61	34.69	4.96
Other Non-Store	35.72	39.47	36.12	36.88	41.78	40.33	41.08	38.77	2.30
Repairers	60.01	59.18	60.05	53.55	54.13	55.59	60.08	57.09	2.75
Average	35.64	35.29	35.98	34.89	35.43	35.86	38.57	35.99	1.12

Table 6 weighted Sales in deflated £Bn

	1997	1998	1999	2000	2001	2002	2003	Total
Non Specialised Stores With Alcohol Licence	66.11	61.07	64.05	76.48	78.04	82.18	66.92	494.83
Non Specialised Stores Without Alcohol Licence	14.80	16.21	17.55	19.39	19.42	21.22	21.91	130.50
Fruit And Vegetables	1.09	0.99	0.95	1.18	0.91	0.83	0.86	6.80
Meat And Meat Products	2.06	1.95	2.07	1.89	1.83	1.75	1.89	13.44
Fish, Crustaceans And Molluscs	0.18	0.20	0.32	0.24	0.18	0.22	0.14	1.48
Bread, Cakes, Flour Confectionery And Sugar Confectionery	0.52	0.54	0.52	0.65	0.61	0.65	0.51	4.01
Alcoholic And Other Beverages	3.44	1.90	3.58	3.49	3.39	3.24	2.97	22.00
Tobacco Products	2.33	2.87	2.33	2.04	2.04	1.63	1.64	14.88
Other Food, Beverages And Tobacco	1.11	1.11	0.99	1.25	1.27	1.49	1.42	8.64
Dispensing Chemists	5.50	5.87	6.25	6.65	6.95	7.17	7.99	46.38
Medical Equipment	1.87	1.59	1.60	1.51	1.76	1.90	2.29	12.52
Cosmetic And Toilet Articles	0.55	0.48	0.59	0.75	0.82	0.94	1.21	5.34
Clothing and Textiles	19.80	19.79	21.51	24.45	23.23	29.81	33.15	171.73
Footwear	6.32	6.49	8.14	7.78	8.77	9.98	9.02	56.50
Furniture, Lights and other Household Articles	6.34	4.00	8.31	10.36	11.85	7.70	7.24	55.81
Electrical Household Appliances And Radio And Television Goods	6.45	7.42	7.97	9.23	10.07	10.83	11.93	63.90
Hardware, Paints And Glass	4.57	4.53	4.25	4.18	4.97	4.96	5.10	32.57
Books, Newspapers And Stationery	1.37	1.68	1.82	1.67	1.83	1.96	2.05	12.40
Floor Covergs	2.12	1.74	2.16	3.66	3.70	3.11	1.17	17.65
Photographic, Computing, and Telecomms equipments	5.20	-	-	-	-	-	-	5.20
Other Specialised Stores	1.96	1.20	1.36	1.86	2.01	1.92	2.26	12.57
Secondhand Shops and Antiques, Including Antique Books	9.19	16.43	17.46	21.30	21.07	26.30	30.12	141.87
Mail Order Houses	0.27	0.12	0.21	0.36	0.21	0.22	0.33	1.71
Other Non-Store	1.93	1.66	1.43	1.55	1.36	1.61	1.72	11.26
Repairers	0.15	0.27	0.29	0.31	0.58	0.59	0.59	2.79
Total	165.22	160.11	175.71	202.24	206.87	222.20	214.44	

Table 7 Constant Price Margin as a % of Sales

	1997	1998	1999	2000	2001	2002	2003	Average	Standard Dev
Non Specialised Stores With Alcohol Licence	27.70	23.82	22.61	22.11	20.09	19.48	21.77	22.33	2.52
Non Specialised Stores Without Alcohol Licence	40.02	42.49	42.53	40.23	43.16	45.08	48.80	43.46	2.80
Fruit And Vegetables	32.81	31.41	29.34	29.88	24.79	30.49	23.89	29.13	3.10
Meat And Meat Products	30.20	33.85	34.32	33.28	32.08	31.40	31.17	32.35	1.41
Fish, Crustaceans And Molluscs	38.07	36.08	38.43	36.97	32.35	27.52	31.28	34.81	3.79
Bread, Cakes, Flour Confectionery And Sugar Confectionery	53.28	51.15	50.97	44.22	49.71	48.03	40.78	48.22	4.06
Alcoholic And Other Beverages	33.43	31.80	28.43	29.18	29.05	31.41	27.62	30.05	1.95
Tobacco Products	33.14	30.00	26.67	22.90	21.69	19.70	21.72	25.82	4.60
Other Food, Beverages And Tobacco	29.68	30.74	31.96	32.38	34.36	35.25	36.52	33.24	2.30
Dispensing Chemists	32.04	28.47	26.28	24.89	24.45	24.11	23.95	26.03	2.76
Medical Equipment	47.72	43.13	45.58	47.71	41.31	38.94	37.71	42.79	3.75
Cosmetic And Toilet Articles	46.04	49.91	48.17	51.24	56.90	54.41	51.12	51.64	3.39
Clothing and Textiles	41.36	41.33	45.74	48.71	52.36	53.75	56.28	49.47	5.52
Footwear	44.91	45.16	46.74	46.80	48.86	49.36	47.23	47.23	1.56
Furniture, Lights and other Household Articles	19.92	30.35	33.21	38.31	45.44	42.78	47.06	38.16	8.92
Electrical Household Appliances And Radio And Television Goods	44.60	48.00	51.47	48.92	48.92	49.69	50.83	49.18	2.08
Hardware, Paints And Glass	39.81	37.83	38.97	37.29	41.26	40.97	41.58	39.78	1.58
Books, Newspapers And Stationery	53.91	50.66	48.60	45.81	51.05	48.48	49.30	49.55	2.35
Floor Coverings	48.67	43.14587	43.96935	46.52976	53.05787	53.6139	52.68139	49.16	4.09
Photographic, Computing, and Telecomms equipments	43.50							43.50	
Other Specialised Stores	54.39	49.02	52.67	54.54	55.36	57.62	56.68	54.78	2.63
Secondhand Shops and Antiques, Including Antique Books	45.74	43.04	45.50	46.61	47.53	50.73	51.72	47.99	2.82
Mail Order Houses	34.12	38.60	31.05	27.74	33.28	36.70	44.91	35.03	5.15
Other Non-Store	41.57	40.98	35.75	36.88	41.27	38.81	40.25	39.47	2.12
Repairers	57.19	57.49	58.05	53.55	54.90	56.75	61.62	57.27	2.36
Average	35.10	34.29	34.91	34.89	35.66	36.61	39.92	36.05	1.77

Table 8 Current Sales by Commodity (panel data)

	1997	1998	1999	2000	2001	2002	2003
Bakery products,cereals, sugar, jam chocolate and confectionaryconfection	6.44	6.29	7.45	7.96	8.65	8.87	8.41
meat and poultry	7.90	7.51	6.97	10.34	10.76	11.25	9.79
Fish	1.41	1.32	1.44	2.17	2.10	2.25	1.73
dairy products	6.33	6.13	6.17	6.50	6.70	7.19	5.56
fruit and vegetables and canned or packaged food	13.44	13.40	14.73	9.39	10.27	10.60	8.98
soft drinks,other food	15.63	14.46	14.60	22.59	22.38	22.62	16.57
alcoholic drinks	7.74	6.44	8.48	10.18	10.30	10.82	9.70
Tobacco	7.40	7.58	7.75	7.71	8.32	8.81	8.24
Cloathing and textiles	19.38	19.46	20.74	24.37	21.64	26.48	27.87
Footwear	3.26	2.92	3.21	3.89	4.11	4.57	5.20
household textiles	1.13	1.12	1.28	2.93	2.84	3.34	3.05
Pharmaceutical preps	1.55	1.57	1.71	2.28	2.64	2.80	2.79
medical & ophthalmological goods	5.39	5.92	6.27	8.02	8.45	9.28	9.95
perfumes, cosmetics and soaps	6.96	6.72	7.10	7.82	8.02	9.06	9.19
soft furnishings,domestic furniture	7.05	7.33	8.82	9.16	9.81	12.09	12.53
domestic gas appliances,other household articles,domestic electrical appliances	7.77	7.21	8.74	8.56	9.51	9.26	8.75
sports and camping equipment	5.41	6.53	7.24	8.19	8.62	9.52	10.41
floor coverings	2.10	2.40	2.61	2.69	2.95	3.34	3.55
audio/visual equipment	3.27	2.36	3.57	4.08	4.06	4.05	3.78
audio/video tape, records	2.78	2.10	2.93	3.74	3.30	3.64	3.54
computers,and telecoms equipment	3.01	2.09	4.00	4.90	5.11	2.86	2.22
souvenirs gifts and novelties,other goods nes	5.08	5.76	6.14	7.78	8.40	8.94	9.38
books newspapers and periodicals	4.64	4.96	4.66	5.02	5.92	6.33	6.42
stationery	1.55	1.52	1.66	3.29	3.49	3.78	3.56
art, print and picture frames,antiques & other second hand goods	1.51	1.41	1.56	1.17	1.53	1.16	1.48
photographic and opt goods	2.21	1.57	1.95	1.07	1.07	1.17	1.57
jewellery	2.80	2.30	2.52	3.11	3.38	3.69	4.16
souvenirs gifts and novelties,other goods nes	11.96	13.09	13.79	13.36	12.53	12.85	12.59
Total	165.09	161.47	178.09	202.25	206.85	220.61	210.94

Table 9 Current Sales by Commodity (panel data)

	Sales prices							Supply Prices						
	1997	1998	1999	2000	2001	2002	2003	1997	1998	1999	2000	2001	2002	2003
Bakery products, cereals, sugar, jam chocolate and confectionary	99	100	100	100	102	103	105	101	101	100	100	100	100	100
meat and poultry	102	100	100	100	104	105	106	98	98	99	100	102	103	104
fish	84	91	99	100	102	105	104	94	96	100	100	100	100	99
dairy products	103	101	100	100	103	105	107	100	100	100	100	101	101	102
fruit and vegetables and canned or packaged food	96	101	101	100	109	109	111	100	99	99	100	100	101	101
soft drinks,other food	97	99	100	100	101	102	103	101	101	100	100	100	100	100
alcoholic drinks	97	99	100	100	101	101	101	99	99	99	100	100	100	100
tobacco	76	83	92	100	105	109	112	97	98	99	100	101	102	103
Cloathing and textiles	108	108	104	100	95	90	88	97	99	101	100	100	100	100
footwear	105	103	101	100	99	98	98	97	98	99	100	101	101	101
household textiles	103	104	104	100	100	98	98	99	99	100	100	100	99	99
pharmaceut preps	94	96	97	100	101	101	102	101	101	100	100	100	101	101
medical & ophthalmological goods	93	96	97	100	102	103	103	101	100	100	100	100	101	101
pefumes, cosmetics and soaps	96	101	103	100	101	99	98	101	101	100	100	100	100	100
soft furnishings,domestic furniture	97	99	100	100	102	104	105	99	99	99	100	101	101	100
domestic gas appliances,other household articles,domestic electrical appliances	105	105	103	100	99	98	97	99	100	100	100	100	100	100
sports and camping equipment	108	107	105	100	97	94	90	101	100	100	100	100	100	100
floor coverings	96	97	99	100	103	103	106	102	101	101	100	100	99	99
audio/visual equipment	137	126	111	100	93	87	77	99	100	100	100	100	100	99
audio/video tape, records computers,and telecoms equipment	108	109	105	100	101	101	100	99	99	99	100	100	100	100
	203	169	127	100	79	64	50	103	102	101	100	99	97	94
souvenirs gifts and novelties,other goods nes	103	102	101	100	100	99	96	99	99	100	100	100	100	100
books newspapers and periodicals	91	94	97	100	104	106	111	97	98	99	100	101	102	102
stationery	91	94	97	100	104	106	111	97	98	99	100	101	102	102
art, print and picture frames, antiques & other second hand goods	95	97	98	100	101	103	105	97	98	98	100	101	101	101
photographic and opt goods	121	110	104	100	97	93	89	98	98	99	100	100	100	100
jewellery	95	97	99	100	101	102	106	96	97	98	100	101	101	100
souvenirs gifts and novelties, other goods nes	98	100	101	100	100	99	99	97	98	99	100	101	100	100
	100	101	101	100	100	99	98	99	99	100	100	100	100	101

Annex 6 – Regression Analyses of ABI Panel

R1 First Regression Margin d52110 d52120- d52700 pt01- pt29 emplvar year

Source	SS	Df	MS	Number of obs =	39220
				F(54, 39165) =	293.37
Model	362	54	6.709077	Prob > F =	0
Residual	896	39165	0.022869	R-squared =	0.288
				Adj R-squared =	0.287
Total	1258	39219	0.032075	Root MSE =	0.15123

Margin	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Industry Dummies						
Non Specialised Stores With Alchohol Licence	-0.09	0.0116	-7.54	0	-0.1105821 -0.0649542	
Non Specialised Stores Without Alchohol Licence	-0.04	0.0112	-3.45	0.001	-0.0608576 -0.0167573	
Fruit And Vegetables	-0.02	0.0137	-1.46	0.145	-0.0467468 0.0068694	
Meat And Meat Products	-0.02	0.016	-1.14	0.254	-0.0495266 0.0130896	
Fish, Crustaceans And Molluscs	0.02	0.024	0.98	0.325	-0.0233726 0.0705954	
Bread, Cakes, Flour Confectionery And Sugar Confectionery	0.07	0.0146	5.09	0	0.0457934 0.1031844	
Alcoholic And Other Beverages	-0.06	0.0135	-4.18	0	-0.0829487 -0.0299805	
Tobacco Products	-0.07	0.0122	-6.1	0	-0.0985694 -0.0506274	
Other Food, Beverages And Tobacco	-0.01	0.0129	-0.75	0.454	-0.0349459 0.0156319	
Dispensing Chemists	-0.16	0.016	-10.2	0	-0.1945766 -0.1318414	
Medical Equipment	-0.05	0.0152	-3.59	0	-0.0842423 -0.0247332	
Cosmetic And Toilet Articles	0.01	0.0128	1.13	0.257	-0.0105639 0.0394832	
Clothing and Textiles	0	0.0118	0.35	0.725	-0.0189284 0.0272221	
Footwear	0	0.0104	0.34	0.731	-0.0168157 0.0239719	
Furniture, Lights and other Household Articles	-0.01	0.0121	-0.78	0.435	-0.0330326 0.014211	
Electrical Household Appliances And Radio And Television Goods	-0.01	0.0121	-0.48	0.629	-0.0295257 0.017854	
Hardware, Paints And Glass	-0.02	0.012	-1.51	0.132	-0.041529 0.0054525	
Books, Newspapers And Stationery (dropped)						
Floor Coverings	0.05	0.0133	3.8	0	0.0244462 0.0764845	
Photographic,Computing, and Telecomms equipments	0.02	0.0122	1.89	0.059	-0.0009001 0.0467987	
Other Specialised Stores	-0	0.0145	-0.03	0.978	-0.0287603 0.0279593	
Secondhand Shops and Antiques, Including Antique Books	0.01	0.011	1	0.315	-0.0105073 0.0326012	
Mail Order Houses	-0.02	0.0148	-1.59	0.113	-0.0526006 0.0055502	
Other Non-Store	0.05	0.0123	4.11	0	0.0263895 0.0745388	
Repairers	0.1	0.0129	7.99	0	0.0774576 0.1278407	
Product Proportions						
Bakery products, cereals, sugar, jam chocolate and confectionary	0.1	0.023	4.55	0	0.0597677 0.1501017	
meat and poultry	0.04	0.0231	1.66	0.097	-0.0069731 0.0836831	
fish (dropped)						
dairy products	-0.01	0.0221	-0.55	0.58	-0.0554745 0.0310576	
fruit and vegetables and canned or packaged food	0.01	0.0224	0.27	0.79	-0.0378604 0.049796	
soft drinks,other food	0.04	0.022	1.95	0.052	-0.0003102 0.0858045	
alcoholic drinks	0.01	0.0232	0.42	0.673	-0.0357239 0.0553416	
tobacco	-0.13	0.0222	-5.66	0	-0.1691132 -0.0820871	
Cloathing and textiles	0.15	0.0216	7.05	0	0.1097725 0.1943834	
footwear	0.17	0.0223	7.48	0	0.1233963 0.210985	
household textiles	0.16	0.023	6.8	0	0.1111112 0.2011061	
pharmaceut preps	0.11	0.0257	4.29	0	0.0599712 0.1607719	
medical & ophthalmological goods	0.09	0.025	3.72	0	0.0441621 0.1423452	

perfumes, cosmetics and soaps	0.28	0.0227	12.29	0	0.2342084	0.3230762
soft furnishings,domestic furniture	0.18	0.0241	7.47	0	0.1327579	0.2271536
domestic gas appliances,other household	0.13	0.0217	6.12	0	0.090423	0.1756782
articles,domestic electrical appliances	0.14	0.0218	6.27	0	0.0938499	0.1792911
sports and camping equipment	0.08	0.0215	3.58	0	0.0347569	0.1190198
floor coverings	0.11	0.0232	4.77	0	0.0652009	0.1562702
audio/visual equipment	0.1	0.0229	4.17	0	0.0506179	0.1402473
audio/video tape, records	0.1	0.0231	4.49	0	0.058553	0.1492711
computers,and telecoms equipment	0.01	0.023	0.3	0.764	-0.0381314	0.0518945
souvenirs gifts and novelties,other goods nes	0.1	0.0222	4.59	0	0.0582912	0.1451363
books newspapers and periodicals	0.06	0.0218	2.8	0.005	0.0184195	0.1038922
stationery	0.14	0.0221	6.27	0	0.0950885	0.1816015
art, print and picture frames, antiques & other	0.08	0.0218	3.51	0	0.0338403	0.1192299
second hand goods	0.23	0.0236	9.9	0	0.1872721	0.279767
photographic and opt goods	0.21	0.0226	9.31	0	0.1659405	0.2544618
jewellery	0.12	0.0213	5.4	0	0.0733768	0.1569033
souvenirs gifts and novelties, other goods nes	0.12	0.0213	5.4	0	0.0733768	0.1569033
Bakery products, cereals, sugar, jam chocolate and confectionary	-0.08	0.0068	-12.46	0	-0.0974886	-0.070984
Employment/Sales	0	0.0004	6.43	0	0.0017823	0.0033458
Year	-4.8	0.7983	-6.01	0	-6.366392	-3.236984
_Constant						

R2 . xtreg reallmargin d52110 d52120- d52700 pts01- pts29,re

note: d52610 dropped due to collinearity

Random-effects GLS regression		Number of obs =	9381
Group variable (i): ruref		Number of groups =	8519
R-sq: within =	0.07	Obs per group: min =	1
between =	0.26	avg =	1.1
overall =	0.27	max =	7
Random effects u_i ~	Gaussian	Wald chi2(53) =	3000.62
corr(u_i, X) =	0 (assumed)	Prob > chi2 =	0

reallmargin	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
Industry Dummies						
Non Specialised Stores With Alchohol Licence	-0.08	0.0229	-3.52	0	-0.1255612	-0.0356884
Non Specialised Stores Without Alchohol Licence	-0.03	0.0233	-1.46	0.143	-0.0798556	0.0115642
Fruit And Vegetables	-0.02	0.0279	-0.64	0.522	-0.0726134	0.0368275
Meat And Meat Products	-0.02	0.0323	-0.56	0.577	-0.0812131	0.0452324
Fish, Crustaceans And Molluscs	-0.03	0.0614	-0.46	0.649	-0.148282	0.0923708
Bread, Cakes, Flour Confectionery And Sugar Confectionery	0.05	0.0307	1.79	0.074	-0.0053491	0.1151132
Alcoholic And Other Beverages	-0.04	0.0269	-1.52	0.129	-0.0935267	0.0118654
Tobacco Products	-0.08	0.0266	-3.09	0.002	-0.1344334	-0.0300321
Other Food, Beverages And Tobacco	-0.03	0.0255	-1.12	0.262	-0.0784779	0.0213203
Dispensing Chemists	-0.16	0.0393	-4.01	0	-0.2344819	-0.0804744

Medical Equipment	-0.03	0.03	-0.98	0.326	-0.0883902	0.0293692
Cosmetic And Toilet Articles	0.05	0.0289	1.61	0.107	-0.0100142	0.1033074
Clothing and Textiles	0.04	0.0237	1.65	0.098	-0.0072378	0.0854752
Footwear	0.02	0.0248	0.78	0.437	-0.0292855	0.0677936
Furniture, Lights and other Household Articles	-0	0.026	-0.12	0.901	-0.0541856	0.0477333
Electrical Household Appliances And Radio And Television Goods	-0.01	0.0276	-0.44	0.663	-0.0661437	0.0421003
Hardware, Paints And Glass	0.01	0.0251	0.44	0.659	-0.0381391	0.0602699
Books, Newspapers And Stationery	0.04	0.035	1.07	0.285	-0.0311943	0.1059841
Floor Coverings	0.01	0.0273	0.47	0.637	-0.0405976	0.0663188
Photographic, Computing, and Telecomms equipments	0	0.0276	0.02	0.984	-0.0535231	0.0546232
Other Specialised Stores	-0.02	0.0338	-0.57	0.57	-0.0853825	0.0469819
Secondhand Shops and Antiques, Including Antique Books	0	0.0227	0.19	0.845	-0.04	0.0488351
Other Non-Store	0.03	0.024	1.09	0.277	-0.020956	0.0731671
Repairers	0.09	0.0254	3.39	0.001	0.0364062	0.1360336
Product Proportions						
Bakery products, cereals, sugar, jam chocolate and confectionary	-2276	256.98	-8.86	0	-2779.307	-1771.957
meat and poultry	-2801	310.32	-9.03	0	-3409.684	-2193.264
fish	-2598	568.93	-4.57	0	-3712.992	-1482.845
dairy products	-3415	236.24	-14.45	0	-3877.738	-2951.681
fruit and vegetables and canned or packaged food	-3154	253.67	-12.43	0	-3650.757	-2656.373
soft drinks, other food	-2898	209.11	-13.86	0	-3307.36	-2487.657
alcoholic drinks	-3459	254.8	-13.57	0	-3957.929	-2959.113
tobacco	-4245	206.36	-20.57	0	-4649.916	-3840.99
Cloathing and textiles	-2081	148.97	-13.97	0	-2373.092	-1789.154
footwear	-2112	221.09	-9.55	0	-2545.667	-1679.005
household textiles	-1743	229.54	-7.59	0	-2192.602	-1292.835
pharmaceut preps	-2035	387.84	-5.25	0	-2795.213	-1274.898
medical & ophthalmological goods	-2231	394.24	-5.66	0	-3003.905	-1458.53
perfumes, cosmetics and soaps	-543	232.9	-2.33	0.02	-999.3727	-86.42087
soft furnishings, domestic furniture	-1476	276.63	-5.34	0	-2018.43	-934.0714
domestic gas appliances, other household articles, domestic electrical appliances	-2049	187.28	-10.94	0	-2415.629	-1681.488
sports and camping equipment	-1875	180.16	-10.41	0	-2228.124	-1521.894
floor coverings	-2388	159.92	-14.93	0	-2701.02	-2074.155
audio/visual equipment	-2367	281.2	-8.42	0	-2918.401	-1816.108
audio/video tape, records	-2640	209.97	-12.57	0	-3051.741	-2228.666
computers, and telecoms equipment	-2069	271.2	-7.63	0	-2600.072	-1536.976
souvenirs gifts and novelties, other goods	-2468	101.52	-24.31	0	-2667.224	-2269.272
books newspapers and periodicals	-2153	202.97	-10.61	0	-2551.031	-1755.418
stationery	-2676	202.86	-13.19	0	-3073.94	-2278.756

art, print and picture frames, antiques & other second hand goods	-1859	210.08	-8.85	0	-2270.65	-1447.134
photographic and opt goods	-2422	189.39	-12.79	0	-2793.284	-2050.891
jewellery	-1311	308.85	-4.24	0	-1916.312	-705.6278
souvenirs gifts and novelties,	-908	268.67	-3.38	0.001	-1434.377	-381.1972
other goods nes	-2103	155.54	-13.52	0	-2407.604	-1797.918
Bakery products, cereals, sugar, jam chocolate and confectionary	0.65	0.026	24.88	0	0.5950728	0.6968263
sigma_u	0.15					
sigma_e	0.08					
rho	0.81	(fraction of variance due to u_i)				

R3. xtreg realmargin d52110 d52120- d52700 pts01- pts29,re

note: d52610 dropped due to collinearity

Random-effects GLS regression	Number of obs =	9381	
Group variable (i): ruref	Number of groups =	8519	
R-sq: within =	0.07	Obs per group: min =	1
between =	0.26	avg =	1.1
overall =	0.27	max =	7
Random effects u_i ~	Gaussian	Wald chi2(53) =	3000.62
corr(u_i, X) =	0 (assumed)	Prob > chi2 =	0

realmargin	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
Industry Dummies						
Non Specialised Stores With Alcohol Licence	-0.08	0.0229	-3.52	0	-0.1255612	-0.0356884
Non Specialised Stores Without Alcohol Licence	-0.03	0.0233	-1.46	0.143	-0.0798556	0.0115642
Fruit And Vegetables	-0.02	0.0279	-0.64	0.522	-0.0726134	0.0368275
Meat And Meat Products	-0.02	0.0323	-0.56	0.577	-0.0812131	0.0452324
Fish, Crustaceans And Molluscs	-0.03	0.0614	-0.46	0.649	-0.148282	0.0923708
Bread, Cakes, Flour Confectionery And Sugar Confectionery	0.05	0.0307	1.79	0.074	-0.0053491	0.1151132
Alcoholic And Other Beverages	-0.04	0.0269	-1.52	0.129	-0.0935267	0.0118654
Tobacco Products	-0.08	0.0266	-3.09	0.002	-0.1344334	-0.0300321
Other Food, Beverages And Tobacco	-0.03	0.0255	-1.12	0.262	-0.0784779	0.0213203
Dispensing Chemists	-0.16	0.0393	-4.01	0	-0.2344819	-0.0804744
Medical Equipment	-0.03	0.03	-0.98	0.326	-0.0883902	0.0293692
Cosmetic And Toilet Articles	0.05	0.0289	1.61	0.107	-0.0100142	0.1033074
Clothing and Textiles	0.04	0.0237	1.65	0.098	-0.0072378	0.0854752
Footwear	0.02	0.0248	0.78	0.437	-0.0292855	0.0677936
Furniture, Lights and other Household Articles	-0	0.026	-0.12	0.901	-0.0541856	0.0477333
Electrical Household Appliances And Radio And Television Goods	-0.01	0.0276	-0.44	0.663	-0.0661437	0.0421003

Hardware, Paints And Glass	0.01	0.0251	0.44	0.659	-0.0381391	0.0602699
Books, Newspapers And Stationery	0.04	0.035	1.07	0.285	-0.0311943	0.1059841
Floor Coverings	0.01	0.0273	0.47	0.637	-0.0405976	0.0663188
Photographic, Computing, and Telecomms equipments	0	0.0276	0.02	0.984	-0.0535231	0.0546232
Other Specialised Stores	-0.02	0.0338	-0.57	0.57	-0.0853825	0.0469819
Secondhand Shops and Antiques, Including Antique Books	0	0.0227	0.19	0.845	-0.04	0.0488351
Other Non-Store	0.03	0.024	1.09	0.277	-0.020956	0.0731671
Repairers	0.09	0.0254	3.39	0.001	0.0364062	0.1360336

Product Proportions

Bakery products, cereals, sugar, jam chocolate and confectionary	-2276	256.98	-8.86	0	-2779.307	-1771.957
meat and poultry	-2801	310.32	-9.03	0	-3409.684	-2193.264
fish	-2598	568.93	-4.57	0	-3712.992	-1482.845
dairy products	-3415	236.24	-14.45	0	-3877.738	-2951.681
fruit and vegetables and canned or packaged food	-3154	253.67	-12.43	0	-3650.757	-2656.373
soft drinks, other food	-2898	209.11	-13.86	0	-3307.36	-2487.657
alcoholic drinks	-3459	254.8	-13.57	0	-3957.929	-2959.113
tobacco	-4245	206.36	-20.57	0	-4649.916	-3840.99
Cloathing and textiles	-2081	148.97	-13.97	0	-2373.092	-1789.154
footwear	-2112	221.09	-9.55	0	-2545.667	-1679.005
household textiles	-1743	229.54	-7.59	0	-2192.602	-1292.835
pharmaceut preps	-2035	387.84	-5.25	0	-2795.213	-1274.898
medical & ophthalmological goods	-2231	394.24	-5.66	0	-3003.905	-1458.53
perfumes, cosmetics and soaps	-543	232.9	-2.33	0.02	-999.3727	-86.42087
soft furnishings, domestic furniture	-1476	276.63	-5.34	0	-2018.43	-934.0714
domestic gas appliances, other household articles, domestic electrical appliances	-2049	187.28	-10.94	0	-2415.629	-1681.488
sports and camping equipment	-1875	180.16	-10.41	0	-2228.124	-1521.894
floor coverings	-2388	159.92	-14.93	0	-2701.02	-2074.155
audio/visual equipment	-2367	281.2	-8.42	0	-2918.401	-1816.108
audio/video tape, records	-2640	209.97	-12.57	0	-3051.741	-2228.666
computers, and telecoms equipment	-2069	271.2	-7.63	0	-2600.072	-1536.976
souvenirs gifts and novelties, other goods nes	-2468	101.52	-24.31	0	-2667.224	-2269.272
books newspapers and periodicals	-2153	202.97	-10.61	0	-2551.031	-1755.418
stationery	-2676	202.86	-13.19	0	-3073.94	-2278.756
art, print and picture frames, antiques & other second hand goods	-1859	210.08	-8.85	0	-2270.65	-1447.134
photographic and opt goods	-2422	189.39	-12.79	0	-2793.284	-2050.891
jewellery	-1311	308.85	-4.24	0	-1916.312	-705.6278
souvenirs gifts and novelties,	-908	268.67	-3.38	0.001	-1434.377	-381.1972
other goods nes	-2103	155.54	-13.52	0	-2407.604	-1797.918
Bakery products, cereals, sugar, jam chocolate and confectionary	0.65	0.026	24.88	0	0.5950728	0.6968263

sigma_u 0.15
 sigma_e 0.08
 rho 0.81 (fraction of variance due to u_i)

Breusch and Pagan Lagrangian multiplier test for random effects:

$$\text{realmargin}[\text{ruref},t] = Xb + u[\text{ruref}] + e[\text{ruref},t]$$

Estimated results:

	Var	sd = sqrt(Var)
realmar~n	0.038444	0.196071
e	0.005637	0.075078
u	0.023298	0.152636

Test: Var(u) = 0
 chi2(1) = 469.25
 Prob > chi2 = 0

R4 Fixed-effects (within) regression
 Group variable (i): ruref
 Number of obs = 9381
 Number of groups = 8519
 R-sq: within = 0.1272
 between = 0.0268
 overall = 0.0289
 Obs per group: min = 1
 avg = 1.1
 max = 7
 corr(u_i, Xb) = -0.42
 F(29,833) = 4.19
 Prob > F = 0

realmargin	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Product Proportions					
Bakery products, cereals, sugar, jam chocolate and confectionary	-3140	1435.8	-2.19	0.029	-5957.874 -321.6133
meat and poultry	-4633	1128.4	-4.11	0	-6847.713 -2418.162
fish	5505	6116.6	0.9	0.368	-6500.561 17511
dairy products	-6061	2006.2	-3.02	0.003	-9999.021 -2123.227
fruit and vegetables and canned or packaged food	-2805	1305.6	-2.15	0.032	-5367.607 -242.2162
soft drinks,other food	-3111	1048.5	-2.97	0.003	-5169.382 -1053.461
alcoholic drinks	-3081	1774.5	-1.74	0.083	-6564.156 401.9676
tobacco	-4099	746.08	-5.49	0	-5563.19 -2634.346
Cloathing and textiles	-1914	343.1	-5.58	0	-2587.305 -1240.414
footwear	-2652	661.17	-4.01	0	-3949.854 -1354.361
household textiles	-2386	743.3	-3.21	0.001	-3844.802 -926.887
pharmaceut preps	123	2929.2	0.04	0.967	-5626.786 5872.309
medical & ophthalmological goods	-1735	2777.6	-0.62	0.532	-7187.322 3716.342
pefumes, cosmetics and soaps	-1164	1594.5	-0.73	0.466	-4293.549 1965.993
soft furnishings,domestic furniture	-1385	1176.9	-1.18	0.24	-3694.788 925.1892

domestic gas appliances,other household articles,domestic electrical appliances	-2475	710.69	-3.48	0.001	-3869.814	-1079.92
sports and camping equipment	-836	467.22	-1.79	0.074	-1753.509	80.61496
floor coverings	-1827	483.22	-3.78	0	-2775.04	-878.1057
audio/visual equipment	-4163	4727.1	-0.88	0.379	-13441.84	5115.066
audio/video tape, records	-2802	1052.6	-2.66	0.008	-4868.325	-736.3939
computers,and telecoms equipment	-1070	1965.5	-0.54	0.586	-4927.61	2788.081
souvenirs gifts and novelties,other goods nes	-836	266.85	-3.13	0.002	-1359.731	-312.196
books newspapers and periodicals	46.7	583.17	0.08	0.936	-1098.01	1191.317
stationery	326	1521.3	0.21	0.831	-2660.295	3311.794
art, print and picture frames, antiques & other second hand goods	-557	743.38	-0.75	0.454	-2016.244	901.9837
photographic and opt goods	-2019	1393.3	-1.45	0.148	-4753.519	715.8761
jewellery	-1790	829.65	-2.16	0.031	-3418.465	-161.5733
souvenirs gifts and novelties, other goods nes	-3217	1069.1	-3.01	0.003	-5315.427	-1118.528
	-1539	437.89	-3.51	0	-2398.342	-679.3293
Bakery products, cereals, sugar, jam chocolate and confectionary	0.61	0.039	15.57	0	0.5308715	0.6840796
sigma_u		0.215				
sigma_e		0.0751				
rho		0.8913 (fraction of variance due to u_i)				
F test that all u_i=0:		F(8518, 833) =		5.37 Prob > F =		0