

# Systems of Price Indices & supporting Frameworks

Presentation by David Fenwick

Joint UNECE/ILO meeting on  
consumer price indices  
Geneva 2012

# Background: the issue

- Problems associated with multi-purpose CPIs (inflation target, measure of price stability, compensation index, deflator)
- Different index construction can have significant impact for economic analysis
  - Original/main purpose determines – the legacy of history?
    - Concepts & methods
      - Goods & services covered, the way in which prices are covered & index construction
  - Different index construction leads to different numerical results
    - Geometric versus arithmetic means for elementary aggregates
    - Choice between arithmetic and geometric means – can account for differences of +0.5 percentage points.
  - Important for
    - Management of Economic Policy e.g. inflation targeting
    - National Accounts - productivity & welfare are residuals derived by subtracting a series from a deflated number. Inappropriate use of price indices will render a meaningless figure
      - Deflators and CPIs are not interchangeable
- Legacy of history

# UK example: the Consumer Prices Index & Retail Prices Index

## Legacy - history

### RPI:

- Established in June 1947 although not 'official' until January 1956 (& in World War I, introduced an index of costs facing what working man should spend his money on)
- improvements via recommendations from advisory committees (last met 1994)
  - Succeeded by CPI Technical Board
- Significant changes last made in 1987

### CPI (& HICP):

- Launched in January 1996; key principle international comparability & standards
  - developed by EU to assess membership of the European Monetary Union
  - became ECB's inflation measure to define/assess price stability in Euro area
  - since Dec 2003 basis for UK Government's inflation target
- Standards of construction and continuous improvement via European legislation

# UK example: the Consumer Prices Index & Retail Prices Index

<b>Main Uses of RPI have been.....</b>	<b>Main Uses of CPI are.....</b>
<ul style="list-style-type: none"><li>• <b>Macroeconomic indicator</b><ul style="list-style-type: none"><li>– Inflation measure</li><li>– Deflation of expenditure and output (e.g. household expenditure and GDP)</li></ul></li><li>• <b>Income adjustment</b><ul style="list-style-type: none"><li>– Indexation of tax allowances</li><li>– Indexation of incomes</li><li>– Up-rating redemption values of certain gilts and national savings certificates</li><li>– Indexation of pensions and benefits (until recent move to CPI)</li></ul></li><li>• <b>Price adjustment</b><ul style="list-style-type: none"><li>– E.g. contract escalation</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Macroeconomic indicator</b><ul style="list-style-type: none"><li>– UK Government's official inflation target</li><li>– Deflation of certain economic series (e.g. the retail sales index)</li></ul></li><li>• <b>International comparison and inflation measurement</b><ul style="list-style-type: none"><li>– Used by Eurostat (HICP) in calculation of European Union inflation</li><li>– Nearly always used when UK inflation compared to other countries</li></ul></li><li>• <b>Income adjustment</b><ul style="list-style-type: none"><li>– Indexation of incomes (now used in future for up-rating of state pensions etc but with some criticism e.g. No owner-occupier housing costs)</li></ul></li><li>• <b>Price adjustment</b><ul style="list-style-type: none"><li>– Contract escalation?</li></ul></li></ul>

# UK example: the Consumer Prices Index & Retail Prices Index

**Main Differences: can have numerical impact...up to 1 percentage point**

Topic	CPI	RPI
Population Base	<ul style="list-style-type: none"> <li>• all private &amp; institutional households</li> <li>• foreign visitors to the UK</li> </ul>	<ul style="list-style-type: none"> <li>• excl. top 4% of households by income</li> <li>• excl. pensioner households (those who derive three quarters of total income from state benefits)</li> <li>• excl institutional households</li> <li>• excl. foreign visitors to the UK</li> </ul>
Commodity Coverage	<ul style="list-style-type: none"> <li>• excl. most housing costs e.g. owner occupied housing &amp; council tax</li> <li>• incl. university accommodation fees, foreign students university tuition fees, unit trust &amp; stockbrokers charges</li> </ul>	<ul style="list-style-type: none"> <li>• incl. housing costs e.g. mortgage interest payments, depreciation, buildings insurance and council tax</li> <li>• excl. university accommodation fees, foreign students university tuition fees, unit trust &amp; stockbrokers charges</li> </ul>
Index Methodology – formula	<ul style="list-style-type: none"> <li>• geometric mean</li> </ul>	<ul style="list-style-type: none"> <li>• arithmetic mean</li> </ul>

# Background: the issue

- Presentations advocates a more systematic approach to the strategic development & production of price indices
  - **Stage of Processing** Frameworks (higher-level)
  - **Stage of Production** Frameworks (lower-level)
  - Extension to framework of current and constant supply & use balances into **social accounting matrices** designed to facilitate direct comparison of price indices
  - The latter should resolve inappropriate use of consumer price indices as deflators
- Paper also attempts to stimulate a broader-based debate on index and deflator construction
  - Deflators and CPIs are not interchangeable
- The goal should be international harmonisation based on the computation of relevant price indices & their appropriate use
  - Better communication between producers of price indices (CPIs etc) & national accountants & appreciation of user needs

# Background: the issue

- Index methods were worked out in the late 19th and early 20th centuries.
- Index number theory has advanced to give us better information on target index formula
  - Fixed basket and symmetric averages of standard formulas
  - The stochastic (statistical estimator) approach
  - The test or axiomatic approach
  - The economic approach
  - The Fisher, Walsh, and Törnqvist indices emerge as “best”
    - But compilation issues remain
    - National Statistics Offices compute Laspeyres-type index
- Good progress but not all issues resolved
  - Manuals/Handbooks – positive step
  - Most recently the RPPI Handbook & the CPPI Handbook
- Progress by National Statistics Offices but compilation practices lagging behind
  - Lack of NSO strategies

# Introduction: frameworks for price indices

- Most countries publish a range of price indices.
- CPIs, PPIs, RPPIs....etc
  - Tend to be presented separately as specialised, stand-alone measures.
    - Can constrain the use made of the large volume of price data that is collected on an ongoing basis.
    - Restricts the analytical value which could be enhanced by drawing together the different series and presenting them as a system or “family” of price indices in a coherent statistical framework.
- Frameworks facilitate the examination of the relationships between different price inflation measures.
  - Helps analysts in their understanding and interpretation of inflationary signals.
  - By identifying gaps, can also accommodate future developments in the field of price statistics.

# Introduction: frameworks for Price Indices

- Different conceptual frameworks can be used to address fundamental issues related to the nature of the index. Such as, for a Consumer Price Index.
  - Fixed-basket vs. COLI
  - COLI takes into account consumer substitution
- The conceptual basis of an index will (should) determine method of construction, including the formulae used for the aggregation of prices.
- Other frameworks can be used to identify gaps in required indices .
- The challenge for national statistical institutes is fourfold:
  - Identify user needs
  - Conceptualise user needs in terms of economic theory.
  - Translate the underlying concept into statistical measurement terms following the fundamental principles of price index measurement.
  - Construct the indices so defined & evaluate them against purpose.

# Introduction: complementary frameworks for Price Indices

- Differentiation between.
  - Underlying conceptual frameworks.
    - Used to define different methods of index compilation.
    - In follow up to the identification of different user needs.
  - Higher-level frameworks.
    - Designed to identify gaps in the provision of price indices which can then be compared with user needs.
- Both help facilitate an understanding of the relationships between different indices.
  - Also help to facilitate coherence and statistical integration.
  - Compliment one another and together provide a systematic approach to the delivery of a coherent family of price indices.

# System of Price Indices – higher level frameworks

- Higher-level frameworks
  - The system of national accounts
    - Provides the basic guidelines for building appropriate frameworks for CPIs.
    - Provides a methodology for developing and extending the core system of price indices.
    - Facilitates the examination of the relationships among different price inflation measures.
  - **Stage of Processing Framework**
    - Provides analytical tool for understanding the inflationary process and also for identifying data gaps and coherence between measures of inflation.

# System of Price Indices – higher level frameworks: national accounts & **social accounting matrices**

- The system of National Accounts provides basic guidelines for building such frameworks, covering all major economic activity including production and consumption and intermediate outputs.
  - Also provides a methodology for developing and extending the core system to meet specialised needs
  - Whilst maintaining consistency of approach, both in concepts and practical measurement, and coherence in terms of the definition, classification and measurement of flows and stocks of goods and services.
- Underlying tool is the construction of **Social Accounting Matrices**.
  - A matrix presentation of SNA accounts.

# System of Price Indices – higher level frameworks: national accounts & **social accounting matrices**

- Design and construction of **SAMs** is not standardised but can be adapted to be most suitable for the purpose – gives flexibility
  - For example analysis by the process of production or by the use of products
  - Can be constructed according to different classifications e.g. by purpose for satellite accounts and facilitate the identification of the appropriate deflators for different sectors such as health
- **SAMs** provide a generic structured approach to the identification of data gaps and coherence issues relating to economic data including families of price indices
  - For example, the stage of processing framework (specific example).
  - **SAMs** still remain to be exploited to their full potential by the statistical community

# System of Price Indices – higher level frameworks: **stage of processing frameworks**

- **Stage of Processing Frameworks**
  - Step 1 - Divide the economic process into different stages.
    - Rest of world
    - Production
    - Final demand
  - Step 2 -Indices grouped according to coverage.
    - Consumers' expenditures
    - Other elements of final demand
    - Inputs into and outputs from the manufacturing sector
    - Trade price indices.

# System of Price Indices – higher level frameworks: **stage of processing frameworks**

- The treatment of other sectors is as follows.
  - **Retail/Wholesale.** Retail & wholesale distribution is shown as a distinct component of the production process - each is shown separately under intermediate demand.
  - **Services.** Are presented as a single category but warrants a further breakdown in view of its increasing weight- for instance into financial services, healthcare, transportation, telecommunications, computer network services.
  - **Rest of the World.** Appears as a supplier of goods but does not appear within the intermediate stage activities as a consumer as it plays no part in economic activity within the UK. It does, however, appear under “Final Demand”, reflecting exports from the UK.
  - **Other indices.** Consists of Agricultural Price Indices, Building Costs Indices and Construction Input and Output Price Indices.

# System of Price Indices – higher level frameworks: **stage of processing frameworks**

- **Stage of Processing Frameworks**

- Inform policy formation
- Provide the basis for systematically analysing the build-up of inflationary pressures in the economy and for tracking relationships between price developments in particular sectors
- Provides a useful tool for identifying gaps in available price index series and a focal point for investigating coherence in index construction (from a compilers point of view)

# System of Price Indices – higher level frameworks: **stage of processing frameworks**

- The main series of price indices are then grouped according to coverage. For the UK this is as follows
  - **Consumers expenditure** (the Retail Prices Index [RPI], Consumer Prices Index [CPI] (Harmonised Index of Consumer Prices [HICP])
  - **Other elements of Final Demand** (the Index of Government Prices [IGP] and Index of Investment Prices [IIP])
  - **Inputs into and outputs from the manufacturing sector** (the Producer Prices Index [PPI])
  - **Trade price indices**

# System of Price Indices – higher level frameworks: **stage of processing frameworks**

- Not just CPI
  - **Coherence between all price indices**
- The **PPIs** and the trade price indices each cover a particular segment of economic activity
- The **PPIs** are stand-alone, industry-based net sector indices relating to materials used in production and articles produced
  - The net sector basis means that transactions between establishments classified to the same industry sector are out-of-scope
  - Advantage of net sector approach is that it avoids the distorting effects that result from multiple counting of transaction prices as commodities flow through different production processes, as would occur under a “gross sector” approach
  - But exclude many intra-sector transactions so incomplete
- The **trade price indices** relate to imported and exported goods

# System of Price Indices – higher level frameworks: **stage of processing frameworks**

- For all significant transfers of goods and services from one part of the economy to another, there should be a representative price index.
- Based on directly-measured prices that reflect the changing level of prices for all such goods (or services).
  - Prices charged by the manufacturing sector for consumer goods sold to the retail/wholesale sector are reflected in PPIs (Producer Price Indices).
  - Prices charged by the retail sector for consumer goods sold to private consumers are reflected in the RPI (and also by the CPI and the HICP).
- Buyers, are classified into two broad groups: intermediate demand and final demand.
  - Most sectors of production are involved in both buying inputs and selling output - so they appear in the table both as buyers and as sellers.

# System of Price Indices - Stage of Processing Framework

Example: UK

Annex A: Initial design for an analytical (Stage of Processing) framework for the UK

From:		To: Intermediate Demand						To: Final Demand						
		Agricult.	Manuf'g Mining + Quarry'g	Constr'n	Retail	Wholesale	Services	Private	Govt	Equip't & Vehicles	Constr'n	Exports PPS Div'n	Trade Stats	
Rest of World	Category of good/service													
	Raw materials+fuels	1	2	3	4	5								
	Semi-manuf. goods /a	6	7	8	9	10								
	Finished intermed. goods	11	12	13	14	15								
	Consumer goods	16	17	18	19	20								
Capital goods	21	22	23	24	25									
Services	26	27	28	29	30									
Domestic Production	Agriculture	31	32	33	34	35								
	Manufact'g, Mining & Quarrying	Raw materials+fuels	36	37	38	39	40							
		Semi-manuf. goods /a	41	42	43	44	45							
		Finished intermed. goods	46	47	48	49	50							
		Consumer goods	51	52	53	54	55							
		Capital goods /f	56	57	58	59	60							
	Construction	Buildings etc	61	62	63	64	65							
		Raw materials+fuels	66	67	68	69	70							
	Retail, Wholesale, Distribution	Semi-manufactured goods	71	72	73	74	75							
	Finished intermediate goods	76	77	78	79	80								
Consumer goods	81	82	83	84	85									
Capital goods	86	87	88	89	90									
Services	91	92	93	94	95									
Labour supplied by the household sector		Corporate Services Price Indices												
		Average Earnings Indices /c												

- /a from wholesalers/dealers/import agents
- /b capital eqpt purchased through wholesalers/agents are not covered by the IIP - which reflects changing levels of output prices (ie manufacturers list or order prices)
- /c there may be direct purchases, but such transactions are not reflected in any published indices
- /d The only export prices collected by PPS are from the producers (EPI1s). The EPI2s published by Trade Stats cover all exported goods; but only the EPIs determined by PPS are based on direct price collection
- /e this block is equivalent to the sale of labour by private households to the productive sectors of the economy
- /f most capital goods will, by definition, feed into intermediate demand - but capital goods purchased for re-sale by dealers (eg cars) will be classified as intermediate demand
- /g not yet based on directly-collected prices - but an estimate of imported capital goods prices is made for the FEPI (and for the PINCCA)
- /h expenditure on services incurred as an integral part of the acquisition of capital goods is classified as part of investment expenditure
- /i output from the construction sector feeds into Govt final consumption (why?)
- /j from wholesale to retail
- /k eg domestic help
- /l capital goods that feed into Govt Final consumption (eg PCs costing < £1000)

**Key to the gaps:**

1. Imports of services
2. Imports of capital goods
3. Re-exports
4. Wholesale prices
5. Exports of services
6. Imports of intermediate goods
7. Imports of consumer goods
8. Exports of prices charged by wholesalers/agents

Construction Output Price Indices	
Building Costs Indices	
House Price Index	
Import Price Indices	
Export Price Indices (PPS Div'n)	
Export Price Indices (Trade)	

Producer Prices Index	
Components of the FEPI (ICP + IIP + IGP)	
Harmonised Index of Consumer Prices	
Retail Prices Index	
Agricultural Purchaser and Producer Price Indices	
No price indices published for these transactions	


# System of Price Indices - **Stage of Processing Framework**

- The practical advantages of such an approach.
  - The associated table of inflation rates can be used for analytical purposes and help inform economic policy.
  - Aggregate price indices (and inflation rates) for each row & for each column may be computed to produce inflation rates for different sectors.
  - Possible enhancements to currently published indices can be identified.
  - Potentially more major gaps can be identified.
  - Issues relating to statistical integration and coherence and can be identified e.g. issues relating to coherence in concepts and practical measurement arise when combining rows and columns.
- Current values of the transfers for each cell help identify the relative importance of the "gaps".

# System of Price Indices – **Lower Level Frameworks**

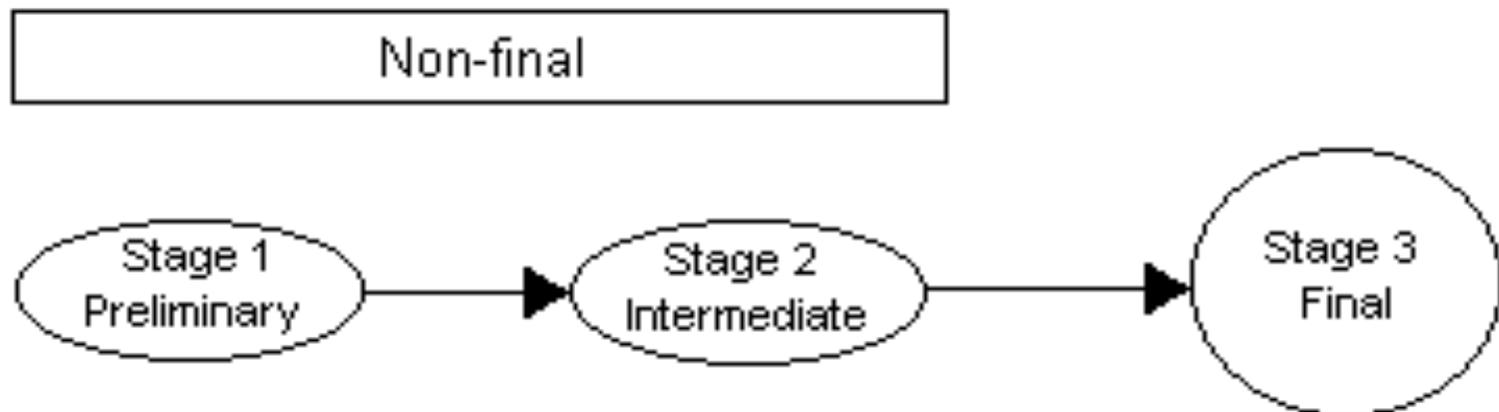
- *Lower-level Frameworks*
  - Supplemented higher-level frameworks.
  - Provide structures for enhancing analysis and for the identification of outstanding data requirements.
  - Not so well developed so less coherence in outputs.
- ***Stage of Production Framework***
  - Most well-used example.
  - Dig down deeper into PPIs

# Systems of Price Indices – **Stage of Production Framework**

- Under the stage of production concept commodity flows are categorised sequentially according to their destination along the production chain.
- Follows an input-output approach.
- The primary classification is between final and non-final commodities where.
  - **Final commodities** are those destined for final consumption, capital formation or export.
  - **Non-final commodities** are those that flow into inter-mediate consumption before further processing.

# Systems of Price Indices – Stage of Production Framework

- The non-final commodity flows can be further divided between preliminary commodities and intermediate commodities.
  - Because non-final commodities can flow into the production of both final and other non-final commodities.
- “first stage intermediate goods” are used in the production of “second stage intermediate goods”; “second stage intermediate goods” flow into the production of “final goods”. For each stage, separate indices for domestic production and imports & “final goods” are further split into capital goods, consumer goods and exports.



# Systems of Price Indices – **Stage of Production Framework**

- The Stage of Production Framework provides both a powerful analytical tool and a method of identifying data gaps and issues relating to statistical coherence and integration.
- But it is more challenging than the Stage Of Processing Framework.
  - The potential data requirements, are much greater.
  - Due in large part to the more detailed level at which the analysis is undertaken.
- The challenges vary in degree between different price indices e.g. CPI methodology is relatively more developed.
  - But the conceptual basis of a CPI is often compromised by multiple uses.

# Systems of Price Indices – **Stage of Production Framework:** bauxite production

- Bauxite production is classified as Stage 1 production.
- Bauxite is used as input into the (Stage 2) production of alumina.
- Alumina is used as an input into the (Stage 3) production of aluminium.
  - This is the final stage of production because the aluminium is then exported i.e. it passes to Final Demand.
- Some judgement in determining the (number of) stages.

Preliminary	Intermediate	Final	Final
Stage 1	Stage 2	Stage 3	Demand
Bauxite	Alumina	Aluminium.	Export
	Bauxite	Alumina	Consumption
		Bauxite	Capital Formation

# System of Price Indices

- The approaches described differentiate between
  - Underlying conceptual frameworks used to define different methods of index compilation, in follow up to the identification of different user needs.
  - Higher-level frameworks designed to identify gaps in the provision of price indices which can then be compared with user needs.
- Both facilitate coherence and statistical integration and a systematic approach to delivery of a coherent family of price indices
  - Including better quality national accounts from more fit-for-purpose **deflators**



# SNA (Chapter on Price and Volume measures) & Eurostat Handbook

- CPIs (& PPIs) also used as deflators
- Limited progress in developing deflator methodology shown by limited attention given to constant price estimation in the SNA
- Eurostat handbook gives guidance on an industry by industry basis
  - But goes no further in offering advice on a conceptual framework for deflators than recommending in general terms a Supply-Use approach
- Little generic guidance about when and where it is safe to use price indices to deflate a series they were not designed for
- Alternative approaches to constructing a price index can have a significant impact on the individual indices used for deflation and hence on GDP growth rates
  - 0.5% point difference between UK RPI (arithmetic) and UK CPI (geometric)
- Family of deflators should allow for consistency and coherence across both production and expenditure approaches to GDP
  - Approaches brought together to provide single GDP estimate
- CPI compilers should work closely with National Accountants

# Examples of matters which need to be resolved

- SNA93 distinguishes between volume of consumption and of welfare. A COLI measures the cost of a particular level of welfare rather than of consumption & is not an appropriate family of price indices for deflating components of GDP
  - Deflating household final consumption expenditure by the components of a COLI may be of interest in its own right, but it does not sit happily within GDP, which primarily measures production
- SNA93 does not give unambiguous guidance about the conceptual basis of price and volume indices
  - In consequence there are apparent conflicts in recommendations (for instance, between the use of Fisher indices and of constant price supply and use tables)
- The SNA seems to make the assumption that *all* price observations are aggregated using *weights* (*not the case for a CPI*)
- Closer working between index compilers and national accountants needed & further conceptual thinking
  - coordinated international work and guidance

# A complementary way forward: Social Accounting Matrices (SAMs)

- Stage of Processing (& Production frameworks)
  - The price statistician's and economist's approach
  - “explain” consumer prices as the result of a chain or ‘pipeline’ conveying goods and services towards the consumer
  - difficult to anchor in economic theory
    - Many analyses include lags and envisage sellers setting prices as a mark-up on their actual costs. But rational sellers would set their prices using expected replacement costs
  - *Stage of Processing Framework*
  - In theory for all significant transfers of goods and services from one part of the economy to another, there should be a representative price index
    - But is restricted to flow prices and ignores altogether asset prices and issues related to pricing a large stock of assets from transactions involving a few flows
- Tension between Stage of Processing, which is driven by **economists needs**, and National accountant's Supply and Use frameworks, which are driven by **measurement needs**
  - Can be resolved by the flexibility and generic approach provided by **Social Accounting Matrices (SAMs)**.

# A complementary way forward: Social Accounting Matrices (SAMs)

## – *Stage of Production Framework*

- Takes approach one stage further to a lower level of detail by applying a Stage of Production Framework to Producer Price Index development
- Commodity flows are categorised sequentially according to their destination along the production chain following an input-output approach
- More challenging data requirements e.g. services
- Classification of stages of production can be arbitrary

# Social Accounting Matrices (SAMs)

- Essentially a matrix presentation of SNA accounts
  - Square sets of economic accounts in which each pair of rows and columns represents a single account
    - 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 corresponding column
- Potential tool for developing and extending the core system of the National Accounts to meet specialised needs and maintaining
  - Consistency of approach, both in concepts and practical measurement
  - Coherence in terms of the definition, classification and measurement of flows and stocks of goods and services
- Power of flexibility
  - Design & construction not standardised but can be adapted to be most suitable
  - Can be constructed using classification by purpose for satellite accounts & identify deflators for different sectors e.g. health
  - Allows for multiple sectoring to accommodate any classification

# Accounts relevant for price indices concerned with retail transactions

	1)	2)	3)	4)	5)	6)	7)	8)	9)	Deflators
1) Retailers by SIC		Sales by coicop					Closing stocks replacement			
2) Sales by Coicop			Sales by Coicop*CPI							
3) Sales by CPI Item									Financing of Sales	
4) Purchases by PPI Item	Goods bought-domestic									ppi
5) Imports by IPI item	Goods Imported									ipi
6) Opening Inventories by PPI item	Opening stocks at replacement cost									ppi
7) Closing Inventories by PPI Item								Closing stocks at historic cost	Reval of Closing Stocks	ppi lagged to close
8) Inventories at historic cost by Stocks Classification						Opening stocks at historic cost				
9) Institutions (single account)	Margin			Return to Producers	Return To Importers	Revaluation of opening stocks		Stock change at historic cost		
<b>Deflators</b>			<b>cpi</b>			<b>ppi lagged to opening</b>	<b>ppi</b>			

# Accounts relevant for price indices concerned with retail transactions

- Account 1 = the balance of supply and use for retailers in each SIC category.
  - Each row shows the sales and closing stocks and these are equal to the purchases from domestic sources, purchases from overseas sources, opening stocks, and trade margin in each column.
- Account 2 = disaggregation of the SIC categories used for measuring retail sales into the COICOP categories used for deflating them and the further disaggregation of COICOP categories into CPI elementary Items
- Account 3 = payments for sales classified by elementary item flowing from a composite institutional account that includes households as well as all other institutional sectors in the economy.
- Accounts 4 and 5 = retailers' purchases of domestic and imported products classified by PPI items and IPI items respectively. The return from the sales is paid to the composite institutional account.
- Accounts 6 and 7 show retailers opening and closing stocks valued at replacement cost classified by PPI items

# Accounts relevant for price indices concerned with retail transactions

- Account 8 = opening stocks at historic cost balanced against the closing stocks and stock changes all classified using the ONS stocks classification
- Account 9 = composite institutional account, shows all payments to and from the institutions making transactions
  - Because all institutions are consolidated it contains only one row and will balance automatically if the other accounts are all balanced.

# Accounts relevant for price indices concerned with retail transactions

- Volume estimates for accounts 3 to 7 which are classified using elementary price index classifications are made by deflating directly using the relevant indices
  - All other volume measures are derived indirectly
  - By definition we have no lower level weights for elementary indices
    - Consideration of the appropriate aggregation formula for the deflators, whether to use the geometric mean or the ratio of averages for example, is analogous to that in chapter 20 of the CPI manual
- Deflation of accounts 3 to 7 fixes the volume measure of all the elements of the supply and use balance for retailers ( account 1) except the Sales by SIC and COICOP in cell 1,2 and the trade margin
- Assume that volume of the Trade Margin is a fixed proportion of the sales in each SIC category
  - If we know the volume of all the elements of cell 2,3 this gives us the column totals for the volume of cell 1,2
  - If we assume that all sales with a given COICOP group share the same price movements this gives us all the elements of the cell.

# Accounts relevant for price indices concerned with retail transactions

- Have to rely on proportions extrapolated from some base period as unlikely to have timely information for the body, as opposed to the border, of any cell
- Reconciliation gives a unified estimate of the change in the cost of living that takes account of all information from different parts of the Statistics Office
- Leaving aside the question of the margin the SAM provides
  - A clean comparison of the sampling and aggregation strategies of the different price indices
  - The “Stage of Processing” analysis desired by Popkin et al (assuming rational expectations so that expected replacement prices and proportions equal actual)

# Implications for producers of price indices and users of deflators

- Common thread linking the issues raised is the system of national accounts
  - the common chapter of the UN technical manuals on consumer price indices and producer price indices, entitled “The system of Price Statistics”, takes the SNA as its starting point
- Usefulness is constrained by the limited advice and guidelines on deflators in the SNA
- Some of the difficult choices confronting national accountants may be avoidable if they were better able to articulate their needs to price statisticians
  - Similarly price statisticians need to talk to National Accountants.

# Implications for producers of price indices and index users (including National Accounts & deflators)

- A co-ordinated approach to the systematic application of frameworks for the development of price indices is overdue. The lack of progress is reflected in
  - A limited articulation of the needs of users, particularly national accountants
  - A current lack of availability of relevant price indices, including deflators
  - Limited international comparability both between the different indices produced by different countries and in deflation practices
- The systematic application of strategic frameworks, particularly Social Accounting Matrices, provides a tool for a more relevant family of indices, for filling gaps and addressing issues relating to lack of coherence
- Common methodologies, including between CPIs and PPIs, would add to coherence
  - quality adjustment techniques, for instance, which can have a significant impact on some price indices and deflators such as in the IT sector
- But limit to the progress which individual countries can make without more considered and detailed international guidance

# Systems of Price Indices & supporting Frameworks

End of presentation