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## **Information Paper**

# **Price Indexes and The New Tax System**

**2000**



New  
Issue

**Information paper**

# **Price Indexes and The New Tax System**

**2000**

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AUSTRALIAN BUREAU OF STATISTICS

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## INQUIRIES

- For further information contact the officers listed on page 3.

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## PREFACE

This Information Paper describes issues and implications of The New Tax System for the suite of producer and consumer price indexes compiled by the Australian Bureau of Statistics (ABS). It should be read in conjunction with *Information Paper: ABS Statistics and The New Tax System* (ABS Cat. no. 1358.0), which was released on 26 April 2000 and which describes the implications of The New Tax System for the broad range of statistics compiled by the ABS.

The New Tax System will result in changes in absolute and relative prices for goods and services. The extent to which these changes impact on ABS price indexes varies from index to index depending on the purpose of the index and hence the pricing basis adopted in their compilation.

The direct impact of The New Tax System on the producer price indexes is limited. A range of complex issues arise, however, in the case of the consumer price index. The major issues are summarised on page v and are discussed in detail in the remainder of the paper.

The ABS will conduct seminar programs in all capital cities to provide opportunities for readers to learn more about the issues set out in this paper. Details are contained in the enclosed pamphlet. Queries or comments can also be addressed to the ABS contact officers listed on page 3 of the paper.

Dennis Trewin  
Acting Australian Statistician

## ABBREVIATIONS

ABS	Australian Bureau of Statistics
ATO	Australian Taxation Office
BP	Basic Prices
COICOP	Consumption of Individual Commodities by Purpose
CPI	Consumer Price Index
f.o.b.	Free on Board
GST	Goods and Services Tax
HB	Price Index of Materials Used in House Building
HES	Household Expenditure Survey
LCT	Luxury Car Tax
OTHB	Price Index of Materials Used in Building Other Than House Building
PP	Purchasers' Prices
PPI	Producer Price Index
SOP	Stage of Production
TNTS	The New Tax System
WET	Wine Equalisation Tax
WST	Wholesale Sales Tax



## SUMMARY: KEY ISSUES FOR PRICE INDEXES ARISING FROM THE NEW TAX SYSTEM

- Producer Prices
- The New Tax System (TNTS) will have no **direct** impact on the producer price indexes, except for the Price Index of Materials Used in House Building and the Price Index of Materials Used in Building Other Than House Building where removal of the wholesale sales tax will have some downward influence on some prices, and the Price Index of Materials Used in Coal Mining, where changes to the diesel rebate scheme are expected to have a downward influence on diesel prices.
  - **Indirect** effects of TNTS are expected to have some downward influence on all producer price indexes.
- Consumer Price Index
- TNTS will have a **direct** impact on the Consumer Price Index (CPI). The CPI will continue to measure final transaction prices inclusive of indirect taxes and hence will reflect the net effect of the tax changes included in TNTS.
  - The ABS will introduce new weights into the CPI, based on the 1998–1999 household expenditure survey, for the September quarter 2000, thus introducing the 14th series CPI.
  - A new utility-based commodity classification will be introduced with the 14th series CPI, to better address possible consumer substitution between commodities in response to relative price changes arising from TNTS.
  - **Subject to further evaluation**, direct and indirect fees charged to consumers by financial institutions on deposit and loan facilities; fees charged by agents and other service providers in the transaction of real estate; and fees charged by brokers in the transaction of shares and other securities will be included in the 14th series CPI.
  - Present thinking is that the household expenditure survey will next be conducted in respect of 2003–2004, with new weights being introduced into what will be the 15th series CPI from September quarter 2005.
  - The ABS is unable to measure the full impact (covering first and subsequent round effects) of TNTS on the CPI.
  - While there are significant qualifications attaching to such a measure, the ABS will compile an *experimental constant tax rate measure*, which will abstract from the direct or first round effects of changes in tax rates on the prices of consumer goods and services. This measure will be published in *Australian Economic Indicators* (Cat. no. 1350.0) approximately one month after publication of the September quarter 2000 CPI.
- Average Retail Prices of Selected Items
- Average retail prices published from the September quarter 2000 will reflect the net effect of the tax changes included in TNTS.
- House Price Indexes
- From the September quarter 2000 these indexes will reflect the net effect of TNTS. The First Home Owners Scheme will not be taken into account in compiling these indexes, but will be taken into account in compiling the house purchase expenditure class in the CPI.



## PART A: INTRODUCTION

### 1. INTRODUCTION

**1.1** The New Tax System (TNTS) will come into effect on 1 July 2000.<sup>1</sup> Its implications for the suite of price indexes (both producer and consumer) compiled and published by the Australian Bureau of Statistics (ABS) are wide-ranging. This Information Paper identifies and discusses the statistical issues and sets out ABS plans to deal with these matters.

**1.2** This Information Paper should be read in conjunction with *Information Paper: ABS Statistics and The New Tax System* (Cat. no. 1358.0) which was released on 26 April 2000 and which discusses issues arising from The New Tax System for ABS statistics more generally.

A Brief Description of TNTS  
Aspects Relevant to Price  
Indexes

**1.3** TNTS centres around the introduction of a goods and services tax (GST) to replace the current wholesale sales tax (WST) and some state and territory taxes. Unlike the WST which is only levied on goods, the GST will also be levied on services.

**1.4** The GST will be levied at each stage in the production and distribution chain with the suppliers being liable for the tax. However, as the suppliers will, in general, be able to claim input tax credits for any GST paid on their inputs, the tax will ultimately be paid by final Australian consumers.

**1.5** Some commodities, for example residential rents and most financial supplies will be *input-taxed*, meaning that the GST does not apply to these supplies, but input tax credits are not allowed for GST paid on inputs associated with the supply. Other commodities, such as basic food, most health services, child care and education will be *GST-free* meaning that the GST is not charged on the supply of the item and the supplier is able to claim input tax credits in respect of any GST paid on inputs. Exports are also GST-free.

**1.6** A range of other changes are being made to the indirect tax regime in Australia:

- a luxury car tax (LCT) will be introduced with the intention of ensuring that the prices of cars currently subject to the 45% luxury rate of WST only fall by about the same amount as prices of cars below the luxury car tax threshold. The LCT will be levied on retail sales of vehicles and will be equal to 25% of the GST inclusive value of the vehicle that is in excess of the car depreciation limit (currently \$55,134);
- excise rates on petrol and diesel fuel will be reduced by an amount intended to ensure that the pump price of these fuels need not rise with the introduction of the GST. In addition, a new fuel grant scheme will be introduced from 1 July 2000 to reduce the pump price of petrol and diesel in non-metropolitan and remote areas;

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<sup>1</sup> Some transitional arrangements pertaining to TNTS have already taken effect. On 29 July 1999, the first phase of the wholesale sales tax abolition occurred, with the taxes on most goods previously taxed at 32% (including tape recorders, televisions, cameras, clocks and watches) reduced to 22%. On 1 November 1999, a per stick rate of duty on tobacco products was introduced. The price effects of these changes have already been captured in the consumer price index (CPI).

A Brief Description of TNTS  
Aspects Relevant to Price  
Indexes *continued*

- there will be an extension of the Diesel Fuel Rebate Scheme to enable eligible business activities such as agriculture to claim a full rebate of the diesel excise paid while the introduction of the Diesel and Alternative Fuel Grant Scheme will lower the cost of diesel used in many transport vehicles;
- the excise duty on alcoholic beverages other than wine will be increased to offset the removal of the WST; and
- a wine equalisation tax (WET) will be set at 29% of the wholesale price, to replace the 41% WST on wine.

**1.7** A range of measures also come into effect on 1 July 2000 to compensate households for the price effects of indirect tax reform. These measures are as follows:

- there will be personal income tax cuts through an increase in the tax free threshold, a cut in all marginal rates except the top rate and adjustments to income tax thresholds;
- payment of the Aged Persons Savings Bonus and Self-funded Retirees Supplementary Bonus to eligible persons;
- an increase in social security and veterans pensions and allowances (by 4%), student income support payments and adjustment of income tests;
- an increase in the maximum rate of rent assistance by 7%;
- extension of the Family Tax Initiative, easing of the income test for family allowances, and increases in the maximum level of assistance for child care; and
- introduction of the First Home Owners Scheme (a lump sum of \$7,000 to first home buyers building or buying a new or established dwelling).

**1.8** A timeline for those elements of the TNTS relevant to ABS price indexes is at Attachment 1.

**1.9** It should be evident from the above that TNTS will result in changes in absolute and relative prices for goods and services. The extent to which these changes impact on ABS price indexes varies from index to index depending on the purpose of the index and hence the pricing basis adopted.

Structure of the information  
paper

**1.10** Part B discusses issues arising from TNTS for the range of producer price indexes compiled and published by the ABS. In the main, TNTS will have minimal implications for these indexes. Part C discusses the far more wide-ranging and complex issues for the consumer price index and associated indexes, including foreshadowing the introduction of the 14th Series Consumer Price Index in respect of September quarter 2000. Part D provides a glossary of terms. A range of technical attachments follow.

Further information and  
seminar program

**1.11** The ABS will conduct seminar programs in all capital cities to provide opportunities for interested persons to learn more about the issues discussed in this Information Paper and have their queries addressed. Further details of the seminar program are contained in the pamphlet included in this Information Paper.

Further information and  
seminar program  
*continued*

**1.12** If you will not be attending a seminar, but have queries or comments on the issues raised in this paper, please contact:

*In the case of the producer price indexes:*

Mr David Collins  
Director  
Producer Price Indexes  
Telephone: (02) 6252 6248  
Facsimile: (02) 6252 7060  
Email: david.collins@abs.gov.au

*In the case of the consumer price index:*

Mr Keith Woolford  
Director  
Prices Development  
Telephone: (02) 6252 6673  
Facsimile: (02) 6252 8555  
Email: keith.woolford@abs.gov.au

Both officers can also be contacted by mail at The Australian Bureau of Statistics, PO Box 10, Belconnen ACT 2616.

## PART B: PRODUCER PRICE INDEXES

### 2. IMPLICATIONS OF THE NEW TAX SYSTEM FOR PRODUCER PRICE INDEXES

The ABS PPI Program

**2.1** The implications of TNTS for the ABS producer price indexes (PPIs) relate to both conceptual and practical issues.

**2.2** Reform of the Australian taxation system consists of a number of components. Those of particular significance for the PPIs are the introduction of the GST, and the abolition of the WST. In addition, it is necessary to consider the implications of changes to fuel prices and input taxing of supplies of some services.

**2.3** The expected impacts of TNTS on each of the PPIs, both established and under development, are outlined below.

**2.4** The ABS currently produces a range of well-established, quarterly PPIs relating to manufacturing, building, mining and international trade.

**2.5** The established indexes are:

*Price Indexes of Articles Produced by Manufacturing Industry* (APMI) (Cat. no. 6412.0)

*Price Indexes of Materials Used in Manufacturing Industries* (MUMI) (Cat. no. 6411.0)

*Price Index of Materials Used in House Building* (HB) (Cat. no. 6408.0)

*Price Index of Materials Used in Building Other Than House Building* (OTHB) (Cat. no. 6407.0)

*Price Indexes of Copper Materials* (Copper) (Cat. no. 6410.0)

*Price Indexes of Materials Used in Coal Mining* (Coal) (Cat. no. 6415.0)

*Export Price Index* (EPI) (Cat. no. 6405.0)

*Import Price Index* (IPI) (Cat. no. 6414.0)

**2.6** In addition, a number of new indexes have either recently been developed or are currently under development, namely:

- service industry output indexes, which were first released on 18 April 2000 in a new quarterly publication entitled *Producer Price Indexes for Selected Service Industries* (Cat. no. 6423.0);
- indexes for the outputs of the construction industry; and
- a broad, economy-wide Stage of Production (SOP) producer price index. Experimental SOP indexes were published on 25 March 1999 in *Information Paper: Producer Price Index Developments* (Cat. no. 6422.0).

**2.7** The applicable valuation basis for the PPIs is *purchasers' prices* (PP) for the input indexes and *basic prices* (BP) for the output indexes (see Glossary of Terms for definitions of purchasers' prices and basic prices). It is important to note that input price indexes at purchasers' prices relate to a different pricing point to output indexes at basic prices, and thus cover different transactions in the economy. The applicable pricing basis for the international trade indexes (IPI and EPI) is free on board (f.o.b.), country of origin.

**2.8** The following table contains the short title (see paragraph 2.5 above), catalogue number, type of index and valuation basis for each of the PPIs.

1 PPI PUBLICATIONS

<i>Index Short Title</i>	<i>Catalogue Number</i>	<i>Input or Output Index</i>	<i>Valuation Basis</i>
APMI	6412.0	Output	BP
MUMI	6411.0	Input	PP
HB	6408.0	Input	PP
OTHB	6407.0	Input	PP
Copper	6410.0	Input	PP
Coal	6415.0	Input	PP
EPI	6405.0	n.a.	f.o.b.
IPI	6414.0	n.a.	f.o.b.
Services	6423.0	Output	BP
Construction		Output	BP
SOP		Output	BP

n.a. – not applicable

Conceptual treatment of the GST in the PPIs

**2.9** The GST will be levied at each stage in the production and distribution chain with the tax ultimately being paid (in the main) by the final consumer. This is because, in general, businesses can claim credits for the GST paid on inputs (both intermediate and capital), i.e. GST is a tax on consumption, not production or investment.

**2.10** The prices of the sales or purchases covered by the established PPIs do not represent final transactions. Therefore, the GST paid on purchases by businesses will generally be netted off the GST collected on sales and the balance paid to the Australian Taxation Office (ATO). Thus, for all the established PPIs, a 'net system' will be applied in recording the GST, i.e. GST will be excluded from producer prices.

**2.11** Conceptually, the scope of the new service industry output indexes includes any transactions with households (i.e. final transactions) as well as transactions with other businesses (i.e. intermediate consumption). In practice, the service industry indexes developed to date (in the transport and business services sectors) focus on business-to-business intermediate transactions. To the extent that any business-to-household (i.e. final) transactions are priced in future service industry output PPIs, the GST is out-of-scope and will be excluded because of the basic prices valuation basis.

**2.12** In the compilation of the Australian national accounts, the 'net system' will be applied in recording the GST, i.e. the GST will be recorded as being payable by purchasers, not sellers, and then only by those purchasers who are not able to deduct it. The conceptual treatment of the GST in the PPIs outlined above means that they will be compatible with the requirements for national accounts deflation of current price estimates to produce volume measures.

**2.13** The exclusion of the GST from prices used in compiling the PPIs is consistent with the treatment adopted by statistical agencies in other countries in which a value-added type of tax has been introduced.

Wholesale Sales Tax and PPIs

**2.14** For the PPIs, it is important to note the application of the current WST legislation for services, manufacturing, mining, and international trade. As the sales tax applies to goods only, services do not have the WST applied directly to their supply. Also, there are a number of industries which are currently exempt from sales tax on goods directly used in the production process. Exempt industries of relevance to the current PPIs are mining and manufacturing. Both intermediate and capital inputs directly used in the mining and manufacturing processes are exempt from WST and therefore its removal will not have a direct impact on the PPIs for these industries. However, see paragraph 2.21 below for comments on the possible *indirect* effects of the removal of the WST on the PPIs.

**2.15** For international trade, the Import Price Index adopts a free on board (f.o.b.), country of origin pricing basis and the pricing point is thus prior to the imposition of any WST. Exports are exempt from WST, as sales tax only applies to goods consumed in Australia.

**2.16** The only PPIs compiled with prices including WST are the building materials indexes. For the HB and OTHB price indexes, a number of items currently priced include WST at the applicable rates. It is planned to provide information which will enable users to remove the direct impacts of the abolition of the WST on the indexes released in the September quarter 2000 publications of these two measures (Cat. nos. 6408.0 and 6407.0 respectively).

Changes to fuel prices

**2.17** For businesses, fuel costs are expected to fall under TNTS, especially within the transport sector. For more details see paragraph 1.6.

**2.18** The only existing PPI which directly measures purchases of diesel is the *Price Indexes of Materials Used in Coal Mining* (Cat. no. 6410.0). Under the current diesel rebate scheme, the excise paid on diesel fuel used in off-road mining is *partially* rebated. Under TNTS, mining businesses will be able to claim a *full* rebate of the diesel excise paid. Therefore a direct downward impact is expected on diesel prices recorded in the coal mining index. The ABS will provide information which will enable users to remove the direct effects of the changes in the diesel rebate scheme from the September quarter 2000 index.

Direct impact of TNTS on the PPIs

**2.19** Below is a table which shows for each PPI (see paragraphs 2.5 and 2.6 above for summary titles), the expected direct (or first round) impact attributable to the implementation of TNTS. The assessment of the expected direct impact has been made on the basis that the WST is abolished on 1 July 2000 and that the GST is excluded from the prices used in the compilation of the PPIs.



## 2 DIRECT IMPACTS OF TNTS ON PRODUCER PRICE INDEXES

<i>Index</i>	<i>Expected Direct Impact</i>
APMI	None
MUMI	None
HB	Downward influence on some prices(a)
OTHB	Downward influence on some prices(a)
Copper	None
Coal	Downward influence on diesel prices(b)
EPI	None
IPI	None
Services	None
Construction	None
SOP	None

(a) See paragraph 2.16 above

(b) See paragraph 2.18 above

**2.20** To summarise Table 2, observable direct impacts from TNTS are expected to be reflected in the indexes of building materials (HB and OTHB), where a downward influence on some prices is expected due to the removal of WST from a range of commodities. Changes to the diesel fuel rebate scheme will exert a downward influence on diesel prices included in the coal index.

Indirect effects of TNTS

**2.21** There are a number of indirect (or second round) effects that may impact on prices measured in the PPIs, but have not been considered in this paper. Some examples of possible indirect impacts on business costs are:

- financial services supplies which are input taxed, i.e. supplies are not subject to GST and there are no entitlements to input tax credits;
- the abolition of WST on indirect inputs (e.g. office equipment); and
- reductions in the cost of diesel fuel impacting on the prices of transported goods.

**2.22** Overall, the indirect effects of TNTS are expected to have a downward influence on the PPIs. These indirect effects on the prices measured in the PPI's will not be able to be quantified, unlike the direct effects (see paragraphs 2.16 and 2.18 above).

Summary for PPIs

**2.23** From a user's perspective, the introduction of the GST, as such, will not directly impact on most of the PPIs published by the ABS. The anticipated **direct** impacts of TNTS are associated with the removal of the WST leading to a downward pressure on the prices of some of the commodities included in the two indexes of building materials (HB and OTHB), and changes to the diesel rebate scheme leading to a downward influence on diesel prices included in the coal index. Some **indirect** impacts of TNTS may be embedded in the prices that the ABS collects for PPI purposes, but it will not be possible for the ABS to quantify these effects.

Further Information on PPI  
Issues

**2.24** Readers seeking further information on the impact of TNTS on the PPIs should contact:

Mr David Collins  
Director  
Producer Price Indexes  
PO Box 10  
Belconnen ACT 2616  
Telephone: (02) 6252 6248  
Facsimile: (02) 6252 7060  
Email: david.collins@abs.gov.au

**2.25** Readers are also advised that the ABS will be conducting a series of seminars in all capital cities on the impacts of TNTS on ABS statistics, particularly on the ABS price indexes. Further details are set out in the pamphlet included with this publication, or can be obtained from the above ABS contact officer.

## PART C: THE CONSUMER PRICE INDEX

### 3. IMPLICATIONS OF THE NEW TAX SYSTEM FOR THE CONSUMER PRICE INDEX

**3.1** The consumer price index (CPI) is compiled quarterly and published in *Consumer Price Index, Australia* (Cat. no. 6401.0). It is a measure of price inflation faced by households. In practice this is achieved by measuring the change in the cost of a fixed 'basket' of goods and services from one period to another. As the prices of the items in the basket change, so does the total price of the basket. The basket of goods and services is constructed to represent all metropolitan households.

**3.2** The CPI measures prices or costs incurred by households for the acquisition of goods and services. By definition, these prices or charges are affected by taxes (or subsidies) on either inputs to the manufacture or supply of the item as well as costs and margins of manufacturers and suppliers. *The CPI will continue to measure final transaction prices inclusive of indirect taxes.* This measurement of prices is consistent with international practice in compiling consumer price indexes.

**3.3** Elements of TNTS have already affected some prices paid by households and have been captured in the CPI. These measures include:

- the GST on that component of insurance and other services where payment covers services to be provided beyond 1 July 2000;
- the reduction on 29 July 1999 in WST to 22% for most items previously taxed at 32%; and
- the move to a per stick rate of duty for tobacco products on 1 November 1999.

**3.4** While in concept the treatment of the impact of TNTS on prices collected for the CPI is relatively straight forward, in practice TNTS raises a number of important issues with respect to the CPI. The issues, as presently seen by the ABS, are as follows:

- Are the current weights for the CPI appropriate as we move into the major implementation phase of TNTS? When should CPI weights next be updated following implementation of TNTS? These matters are discussed in Chapter 4.
- Is the current CPI commodity classification sufficiently robust to adequately deal with consumer substitution that is likely to occur as households adjust their expenditure patterns to the new price regime following the introduction of TNTS? This matter is dealt with in Chapter 5.
- Should the item coverage of the CPI be expanded? Chapter 5 also addresses this matter.
- Can the ABS isolate the impact of TNTS on the headline CPI and, if so, how might it publish such measures? Chapter 6 addresses this complex matter.

### 3. IMPLICATIONS OF THE NEW TAX SYSTEM FOR THE CONSUMER PRICE INDEX

*continued*

**3.5** Chapter 7 provides contact information for those readers who wish to follow up on any of the CPI-related issues addressed in this Information Paper.

**3.6** In addition to the CPI, the ABS publishes two ancillary series:

- *Average Retail Prices of Selected Items, Eight Capital Cities* (Cat. no. 6403.0)
- *House Price Indexes, Eight Capital Cities* (Cat. no. 6416.0)

**3.7** The average retail prices publication provides average prices for selected items which are included in the CPI for the eight capital cities. As the prices are as recorded for the CPI, average retail prices published from the September quarter 2000 will include the net effect of the tax changes included in TNTS.

**3.8** The house price indexes publication provides estimates of changes in house prices for each of the eight capital cities of Australia. Indexes are published for both established houses and project homes. From the September quarter 2000 these indexes will reflect the net effect of TNTS. (The First Home Owners Scheme will not be taken into account in compiling these indexes for publication in Cat. no. 6416.0, but will be taken into account in compiling the house purchase expenditure class in the CPI.)

#### 4. THE NEW TAX SYSTEM AND CPI WEIGHTS

**4.1** If all prices in an economy move in the same direction and at the same rate, then weights do not matter in the construction of a consumer price index. Indeed, it would only be necessary to measure the price change of one commodity from one period to another in order to calculate the index. As one moves further away from this unrealistic proposition the issue of weighting in the construction of the CPI becomes increasingly important. Long-established ABS practice is to reweight the CPI following the conduct of each Household Expenditure Survey (HES), the results of which form the basis for calculating the weights.

**4.2** TNTS will result in changes in the relative prices of goods and services purchased by households. Some commodities will become relatively cheaper (and in some cases cheaper in absolute terms as well). In other cases, especially in the case of services, prices will be relatively (and absolutely) more expensive. This *price effect* could lead consumers to substitute between goods and services depending on changes in their relative prices.

**4.3** In addition, the income adjustment arrangements that have been provided to compensate households for the price effects of indirect tax reform could lead to an *income effect* which could likewise impact on consumer spending patterns.

**4.4** The ABS has given careful consideration to the issue of CPI weights in the context of TNTS. Two main issues arise:

- how up-to-date should the weights be prior to the implementation of TNTS?; and
- when should the weights next be updated after TNTS has been implemented?

#### CPI Weights at the Time of Introduction of TNTS

**4.5** The current (13th series) CPI weights are based mainly on expenditures reported in the 1993–94 HES. The most recent HES was undertaken in respect of 1998–99.

**4.6** The ABS has decided that the CPI weights should be as up-to-date as possible prior to the major impact of TNTS, which will occur during 2000–2001. The rationale for this decision follows from the comments in para 4.1 above. The greater the variation in price behaviour across commodities, the greater the role of weights in correctly measuring aggregate rates of price change. As TNTS will be a cause of significant variation in price behaviour over the next few years, it is important that the weights used to construct the index over this period are as representative as possible of contemporary household behaviour. Accordingly, processing of the 1998–99 HES has been expedited so that new weights can be introduced for what will be the 14th series CPI to be released in respect of the September quarter 2000. It is unlikely that 1998–99 expenditure patterns would have been affected by TNTS which makes them suitable as the basis for the update.

CPI Weights at the Time of  
Introduction of TNTS  
*continued*

**4.7** It must be stressed that the introduction of a new weighting pattern into the CPI in respect of September quarter 2000 will not in any way compromise the measurement of pure price change over that quarter, when the main first round effects of TNTS are expected to occur. The new weights are calculated as at June quarter 2000 and the observed price changes that occur between the June and September quarters will be aggregated using these weights.

**4.8** The ABS will issue an Information Paper in September 2000 which will set out, prior to the release of the September quarter 2000 *Consumer Price Index* (Cat. no. 6401.0) in late October, 2000, the new weighting pattern for the 14th Series CPI, together with other changes that might be made to the index at that time and which are discussed later in this Information Paper.

Subsequent Reweighting of  
the CPI

**4.9** As previously noted, TNTS will affect prices of most consumer goods and services and will also impact on household after-tax incomes. The removal of the narrowly based WST, reductions in various other indirect taxes and the introduction of a broadly based GST will not have a uniform effect on prices. Some prices will rise, some will show little change and others are expected to fall. Combined with the income compensation arrangements, household expenditure patterns can be expected to change.

**4.10** Potential changes in household expenditure patterns following implementation of TNTS raise questions as to the timing of further updating of CPI weights beyond the changes being introduced in the 14th Series CPI and, hence, the timing of the next HES. The key issues are as follows:

- a) Would a CPI based on post TNTS quantities produce a significantly different measure of aggregate price change compared to a CPI based on pre TNTS quantities?
- b) To what extent are the relative quantities likely to change as a result of TNTS?
- c) How long will it take for expenditures to settle into a 'normal' pattern following TNTS?
- d) What is the earliest possible time frame to run a HES capable of picking up these normalised expenditure patterns?

**4.11** Attachment 2 describes the essential characteristics of the Australian CPI and, in particular, illustrates the role played by weights. An understanding of Attachment 2 will be helpful in appreciating what follows.

What is the potential for error in the CPI due to out-of-date weights?

**4.12** This is not as simple a question to answer as may be imagined. The difficulty lies in the fact that the impact of any individual item on the aggregate CPI is a function of its weight and its rate of price change. If the prices of all items change at the same rate, then the weights would be irrelevant. The more dispersion in the rates of price change, the greater the role played by weights. Similarly, with some reasonable (but not extreme) dispersion in rates of price change, in general, tolerable percentage errors in weights are inversely proportional to the absolute value of the weight (i.e. the larger an item's weight, the lower the tolerable percentage error).

**4.13** Further, prediction of the tolerable error in the weight for any item depends on knowledge of future price change. Analysis based on past rates of price change can at best only provide an indication of potential future risk.

**4.14** To get a feel for how wrong the weights would have to be before impacting on the aggregate CPI, a sample of CPI expenditure classes has been analysed. Four expenditure classes were selected; Girls' clothing; Motor vehicles; Cigarettes and tobacco; and Audio, visual and computing equipment. The study makes use of the actual weights for these items in June quarter 1998 and, as a plausible set of price changes, the net price effects of TENTS as originally published by the Commonwealth Treasury.

**4.15** The study was undertaken as four pairwise comparisons (i.e. the selected expenditure class and all other items in the index). In each case, the price change for 'all other items' is taken as zero. Using the Treasury predicted price change for the selected item and its weight in the CPI, an aggregate result was calculated (which can be interpreted as the percentage change in the CPI that would result from the given change in the selected item, all other things being unchanged). Then, a new weight was calculated for each selected item sufficient to alter the aggregate result by plus 0.1 percentage point (and then by minus 0.1 percentage point). A change of 0.1 percentage point was chosen as representing a change in the published CPI outcome. The results are shown in the following table.

### 3 SELECTED EXAMPLES OF WEIGHT CHANGES REQUIRED TO ALTER AGGREGATE INDEX BY 0.1 PERCENTAGE POINT

<i>Selected expenditure class</i>	<i>Original weight (per cent)</i>	<i>Price movement (per cent)</i>	<i>Weight required to increase index by 0.1%</i>	<i>Weight required to reduce index by 0.1%</i>	<i>Per cent error required in weight (3)/(1)</i>	<i>Per cent error required in weight (4)/(1)</i>
(1)	(2)	(3)	(4)	(5)	(6)	
Girls' clothing	0.22	6.74	1.63	n.a.	641	n.a.
Motor vehicles	3.88	-8.35	2.63	5.03	-32	30
Cigarettes & tobacco	3.08	13.30	3.84	2.33	25	-24
Audio, visual & computing equipment	1.33	-5.50	n.a.	3.09	n.a.	132

n.a. – not applicable (To achieve the desired result would require a negative weight.)

What is the potential for error in the CPI due to out-of-date weights? *continued*

**4.16** The results are in line with expectations. Where items have small weights, high percentage errors in the weights can be tolerated. Even items with relatively large weights can tolerate errors of 20 to 30% in the weights. However, the tolerable error in the weights declines as the rate of price change increases.

How are relative quantities likely to change as a result of TNTS?

**4.17** Consumer theory tells us that households will alter their consumption patterns in response to changes in absolute prices of items; changes in relative prices of items; and changes in incomes. A thorough analysis of expected changes in relative quantities would require a general equilibrium model with a full set of demand equations (including own-price elasticities of demand, cross-price elasticities of demand and income elasticities).

**4.18** A number of modellers have produced estimates of own-price elasticities for a range of consumer items. Using these estimates for the same four CPI expenditure classes as above, together with the same estimates of TNTS-induced price change, weight changes have been estimated. As with the previous study, the changes have been calculated in a pairwise fashion (i.e. only quantities of selected items are allowed to change as result of changes in own-prices and weights are then re-normalised). The results are shown in table 4.

#### 4 ESTIMATED CHANGE IN SELECTED WEIGHTS DUE TO TNTS

Selected expenditure class	Original weight (per cent)	Price movement (per cent)	Own-price elasticity	New weight (per cent)	Percentage change in weights	Source of elasticity
	(1)	(2)	(3)	(4)	(5)	(6)
Girls' clothing	0.22	6.74	-0.291	0.22	0	(a)
Motor vehicles	3.88	-8.35	-1.200	4.25	10	(b)
Cigarettes & tobacco	3.08	13.30	-0.841	2.74	-11	(c)
Audio, visual & computing equipment	1.33	-5.50	-1.000	1.40	5	(c)

(a) Clements, K. and Smith, M., 1983. 'Extending the Consumption Side of the Orani Model', *Impact Project Papers*, Preliminary Working Paper No. OP38, University of Melbourne, February.

(b) Nicholson, W., 1989. *Microeconomic Theory: Basic Principles and Extensions*, Dryden Press, New York.

(c) Rimmer, M. and Powell, A., 1996. 'An Implicitly Additive Demand System', *Applied Economics*, 28(12): December; previously in *Impact Project Papers*, Preliminary Working Paper No. OP73, October 1992.

**4.19** It is clear that the expected percentage change in weights for all of these items lies below the threshold levels required to induce a 0.1 percentage point difference in the aggregate CPI. Although this study is deficient to the extent that it is limited to only own-price elasticities, it is difficult to argue that the other effects will be sufficiently large to alter the conclusion.

How long before expenditure patterns normalise?

**4.20** As the weights in the CPI are constructed to reflect a 'normal' level of expenditure likely to be representative of expenditure patterns expected throughout the life of a particular series, the length of the adjustment period following a major price shock is important.



How long before expenditure  
patterns normalise?  
*continued*

**4.21** This is unfortunately an area where little empirical work has been done, even in New Zealand and Canada where GSTs have been introduced in the last decade or so. However, most economists would probably be comfortable with the notion that the bulk of the adjustments to expenditure patterns following implementation of TNTS would work their way through the system within about three years.

**4.22** Complicating the issue somewhat in Australia is the phasing in of some of the TNTS changes. Although the vast majority of the changes will be in place from 1 July 2000, with some coming in earlier, some changes (such as the abolition of the State debits tax) are not scheduled until some time later.

**4.23** Although a firm answer to this question cannot be provided, it is reasonable to assume that observable expenditure patterns in the single years either side of July 2000 are those most likely to reflect transition expenditures, and that subsequent years will quickly trend to the 'normal' (or new) equilibrium pattern. Expenditures in 2003–04 should represent a sound base for establishing post TNTS equilibrium expenditure patterns for CPI purposes.

What is the earliest time frame  
for the next HES?

**4.24** In considering the issue of the timing of the next HES, it is important to take into account the use of respondent recall to capture expenditures on lumpy, irregular purchases such as consumer durables and housing. The recall periods extend up to two years. Therefore, given that expenditures are likely to be atypical in the year following July 2000, the earliest timeframe for running a HES that would only capture post TNTS expenditures is 2003–04.

**4.25** If there were to be a three year transition period before expenditures normalise, then a HES would need to be run in respect of 2004–05 to maximise the likelihood of aggregate recorded expenditures approximating the new equilibrium pattern. However, the risk of significant error from a HES run in respect of 2003–04 is judged as minimal.

*Conclusions*

**4.26** Household nominal expenditure patterns will definitely change as a consequence of TNTS. However, the changes in underlying relative quantities are unlikely to be of sufficient magnitude to alter CPI outcomes by as much as 0.1 percentage point per year. After considering a reasonable period for households to adjust to the new set of relative prices and the respondent recall methodology used in HES, there are no strong technical grounds for altering the proposed scheduling of the next HES in respect of 2003–04. Thus it is planned that weights be updated for the introduction of what would become the 15th Series CPI in September quarter 2005. This matter will be kept under review by the ABS over the next few years.

## 5. THE CPI COMMODITY CLASSIFICATION AND ITEM COVERAGE

### Commodity Classification and CPI Bias Issues

**5.1** The CPI commodity classification serves a number of important purposes:

- it assists in describing the CPI item coverage, weighting patterns and methodology to a broad range of users;
- it provides a framework for defining item coverage and identifying whether new items are within scope of the CPI and, if so, where price observations 'belong'; and
- it facilitates the production of indexes for components of the CPI for analytical and other purposes.

**5.2** Notions of consumer utility and substitutability underpin the design of the current classification. The general principle is to structure the classification such that the highest levels of the classification represent items between which substitutability is deemed low, with the degree of substitutability increasing at the finer levels (with the finest level of the formal classification (expenditure classes) representing the level at which underlying quantity weights are fixed between CPI reviews). This approach varies from the more common industry-based commodity classifications which are generally more concerned with grouping items with similar inputs (or manufacturing processes) together rather than grouping items with similar use (or utility) together<sup>1</sup>.

**5.3** As discussed in Chapter 4, TNTS will change the price relativities of consumer goods and services and may cause some substitution in consumption. The decision to introduce the 14th Series CPI in the September quarter 2000 (see para 4.6 above) provides the ABS with the opportunity to consider whether the current CPI structure is the most appropriate to accommodate such substitutions and help minimise bias in the CPI<sup>2</sup>. The importance of getting the commodity classification right from an index construction viewpoint was highlighted in the report of the (USA) *Advisory Commission to Study the Consumer Price Index* (Boskin Report: *Toward a More Accurate Measure of the Cost of Living, Final Report* (December 1996)) which stated (page 17, footnote 19) that in order to minimise item substitution and quality adjustment bias, “..... items which are the closest substitutes for each other in terms of how they are used, must be in ..... the lowest levels at which indexes are constructed .....”.

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1 To illustrate this point, consider how the alternative approaches might classify buckets. An industry-based commodity classification is likely to classify plastic, metal and wooden buckets in quite different regions of the classification based on their industry of origin, while a utility-based classification will group them very closely together, as they would be viewed as providing almost identical utility as, say, water-carrying devices.

2 For a detailed discussion of bias in consumer price indexes, and the steps that the ABS takes to minimise the potential for such biases in the Australian CPI see *Information Paper: Issues to be Considered During the 13th Series Australian Consumer Price Index Review* (Cat. no. 6451.0), Appendix 2. So-called substitution bias is an important matter that must be addressed in the technical design of a consumer price index.

Commodity Classification  
and CPI Bias Issues *continued*

**5.4** As well as assessing the suitability of the CPI commodity classification from a bias perspective, there is a further TENTS-related issue to consider. To assist analysis of TENTS impacts, it is highly desirable that the CPI structure remains unchanged from the start of the major changes occurring on 1 July 2000 until at least the timing of the subsequent reweighting of the CPI. In other words, the ABS has a strategic 'window of opportunity' to put in place an enhanced commodity classification in conjunction with the 14th Series CPI commencing in respect of the September quarter 2000.

A Commodity Classification  
for the 14th Series CPI

**5.5** While substantial changes were made to the CPI structure when introducing the 13th series, the ABS considers there are further changes that would better handle possible TENTS impacts.

**5.6** The ABS appreciates that changes to the CPI structure may inconvenience some users. However, there was little adverse reaction to structure changes when the 13th series CPI was introduced in September quarter 1998. Users who feel that they may be inconvenienced by the changes in the CPI commodity classification proposed below should contact the ABS; see the contact details set out in Chapter 7. It may be possible for the ABS to compile tailored indexes, based on the current classification, to assist users in the transition to the new classification. However, in accordance with past practice, the ABS will not compile an index that is equivalent to the current 13th series CPI.

**5.7** In reviewing the CPI commodity classification, the ABS has taken account of the recently promulgated international standard classification of Consumption of Individual Commodities by Purpose (COICOP). This commodity classification is based on the concept of household utility and is likely to be recommended by the International Labour Organisation for adoption by all countries in the construction of consumer price indexes. Adoption of a COICOP-based commodity classification in the Australian CPI has the incidental, but significant, advantage of aligning the CPI more closely with the dissection of household final consumption expenditure in the Australian system of national accounts, which is also based on COICOP.

**5.8** Table 5 below sets out the proposed changes to the 13th Series CPI classification at the group and subgroup levels. Attachment 3 sets out a comparison of the detailed structure of the proposed 14th Series CPI commodity classification and the 13th Series CPI classification.

## 5 PROPOSED CHANGES TO 13th SERIES GROUPS AND SUBGROUPS

<i>13th Series CPI Group, Subgroup</i>	<i>Proposed changes</i>
FOOD	n.c.
Dairy and related products	n.c.
Cereal products	n.c.
Meat and seafoods	n.c.
Fresh fruit and vegetables	part of new <b>Fruit and vegetables</b>
Processed fruit and vegetables	part of new <b>Fruit and vegetables</b>
Soft drinks, ice cream and confectionery	change name to <b>Non-alcoholic drinks, confectionery and snacks</b> ; include Fruit and vegetable juices
Meals out and take away foods	n.c.
Other food	n.c.
CLOTHING	change name to CLOTHING AND FOOTWEAR
Men's clothing	n.c.
Women's clothing	n.c.
Childrens and infants clothing	n.c.
Footwear	n.c.
Clothing accessories, supplies and services	n.c.
HOUSING	n.c.
Rents	n.c.
Utilities	n.c.
Other housing	move <i>House insurance</i> to <b>Insurance services</b> in new group INSURANCE AND FINANCIAL SERVICES
HOUSEHOLD EQUIPMENT AND OPERATION	split to form new groups COMMUNICATION and HOUSEHOLD FURNISHINGS, SUPPLIES AND SERVICES
Furniture and floor coverings	change name to <b>Furniture and furnishings</b>
Household textiles	include in <b>Furniture and furnishings</b>
Household appliances, utensils and tools	n.c.
Household supplies	move <i>Pet foods, pets and supplies</i> to renamed group RECREATION
Household services	move <i>Pet services</i> to RECREATION, <i>House contents insurance</i> to <b>Insurance services</b> , include <i>Repairs to household durables</i> with the item repaired
Postal and communication services	create new group COMMUNICATION
TRANSPORTATION	n.c.
Private motoring	move <i>Vehicle insurance</i> to <b>Insurance services</b> in new group INSURANCE AND FINANCIAL SERVICES
Urban transport fares	n.c.
ALCOHOL AND TOBACCO	n.c.
Alcoholic drinks	n.c.
Cigarettes and tobacco	rename <i>Tobacco</i>
HEALTH AND PERSONAL CARE	move <i>Toiletries and personal products</i> and <b>Hairdressing and personal care services</b> to new group MISCELLANEOUS, rename as HEALTH
Health services	n.c.
Personal care products	replace with <b>Pharmaceuticals</b>
Hairdressing and personal care services	move to new group MISCELLANEOUS
RECREATION AND EDUCATION	split to create new groups EDUCATION and RECREATION, move <i>Child care</i> to new group MISCELLANEOUS
Books, newspapers, magazines and stationery	rename as <b>Reading material</b> , include <i>Stationery</i> in <b>Audio, visual and computing media and services</b>
Recreation	split into <b>Audio, visual and computing</b> and <b>Sport and other recreation</b> , the latter to include <i>Pet foods, pets and supplies</i> and <i>Pet services including veterinary</i>
Holiday travel and accommodation	n.c.
Education and child care	<i>Education</i> to become a new group, move <i>Child care</i> to MISCELLANEOUS

n.c. – no or minor change

*continued*

**5.9** Examples of the proposed changes to the commodity classification, with the reason for the change, are:

- combining some expenditure classes where there are high levels of substitution (e.g. fresh and processed vegetables);
- including repair services with the purchase of the item (this breaks with the traditional practice of separating goods and services, because for many items the substitution is between repair or purchase);
- creating sub indexes that are more useful for analytical purposes, for example the removal of hairdressing and personal care services from the Health group to leave a 'pure' health index; and
- dropping expenditure classes that have a low weight, are difficult to price or have questionable analytical value, for example Other household fuel (include with Gas), Men's shirts (include with men's outerwear) and Government-owned dwelling rents (combine with privately-owned dwelling rents).

**5.10** The major changes to the CPI structure will result in:

- the creation of 4 new groups: Insurance and financial services, Communication, Education, and Miscellaneous. Existing groups Food, Alcohol and tobacco, Housing, and Transportation will be largely unaffected (apart from the removal of insurance services from the latter two); and
- the number of expenditure classes falling from 101 to about 91.

**5.11** It may be necessary to make some refinements to the proposed classification over the next few months as the ABS proceeds with its detailed implementation. The final classification, and the weights that will apply, will be set out in a further Information Paper scheduled for release in September 2000 (see also para 4.8 above).

**5.12** Readers will note that the proposed commodity classification for the 14th Series CPI includes a group titled 'Insurance and financial services'.

**5.13** The ABS undertook an extensive public consultation program leading up to the introduction of the 13th series CPI in the September quarter 1998. The most important outcome of that review was to change the principal objective of the CPI from the measurement of changes in the living costs of wage and salary earner households to the measurement of price inflation for the household sector as a whole. Consistent with this objective, the ABS proposed including measures for a range of financial services relating to borrowings, savings, maintenance of accounts with financial institutions, accessing investment advice and the purchase of shares. However, due to conceptual and methodological complexities, the introduction of these price measures was deferred.

Introduction of Financial  
Services into the CPI  
*continued*

**5.14** Since that time, considerable effort has been directed towards developing price measures and weights for various financial services. **While subject to further evaluation**, the items proposed for inclusion in the 14th Series CPI are direct and indirect fees charged to consumers by financial institutions on deposit and loan facilities, fees charged by agents and other service providers in the transaction of real estate and fees charged by brokers in the transaction of shares and other securities.

**5.15** Existing insurance items proposed to be reclassified to the Insurance and financial services group include house insurance, house contents insurance, motor vehicle insurance and compulsory third party insurance. Health insurance would not be included in the new group but would remain as a component of Hospital and medical services. In keeping with existing CPI practice, taxes and other government charges associated with these services would also be included with the relevant item.

**5.16** Other financial service items were considered for inclusion in the new group. These included life insurance and superannuation services, legal services, accounting services, funds management services and financial advisory services. However, data availability and quality issues and to a lesser extent conceptual and methodological complexities, have thwarted efforts to develop reliable price measures for these items so they cannot be considered for inclusion at this stage. For example, life insurance and superannuation services appears to be the largest of the financial type services in terms of value acquired by households. However the information available lacks consistency between data sources and the value directly attributable to households is not readily identifiable.

**5.17** Although total expenditure estimates for the proposed new group are not yet available, initial expectations are that it would make up at least 6% of the CPI by value.

**5.18** The structure for the Insurance and financial services group, as proposed, is as follows:

Insurance and financial services  
    Insurance services  
        Insurance services  
    Financial services  
        Financial services

**5.19** The insurance services expenditure class would be restricted to general insurance and would include house, contents, motor vehicle and compulsory third party insurances. The financial services expenditure class would include both direct and indirect charges levied by financial institutions on households in respect of deposit and loan facilities, the services of real estate agents and other service providers involved in the transaction of residential property and the services of stock brokers for facilitation of share transactions.

Introduction of Financial  
Services into the CPI  
*continued*

**5.20** As previously noted, final decisions on the inclusion of these items in the 14th Series CPI are subject to further evaluation. The Information Paper scheduled for release in September 2000 (see also para's 4.8 and 5.11) will set out the final decisions on whether these items will be included.

6. MEASURING THE IMPACT  
OF THE NEW TAX SYSTEM  
ON THE CPI

**6.1** As noted in para 3.2 above, the CPI will continue to measure final transaction prices inclusive of indirect taxes. The CPI will, in effect, include the net impact of the TNTS on prices paid by households. It is generally anticipated that, as a consequence of the implementation of TNTS, the CPI will increase in the September quarter 2000. In subsequent quarters, increases in the CPI are expected to be smaller than would otherwise have been the case, as the removal of the WST and lower fuel excise reduce embedded production and transportation costs and hence put downward pressure on retail prices. Nevertheless, once all the changes to indirect taxes work their way through the system, the CPI is expected to be at a level somewhat higher than it would have been in the absence of TNTS.

**6.2** The question the ABS believes most Australians would like answered is *What is the total impact of TNTS on the CPI?* Unfortunately this is not a question that can be answered precisely. Attachment 4 discusses those options that the ABS believes are feasible together with the conceptual and methodological issues involved.

**6.3** All of the generally accepted options available to statisticians are essentially accounting exercises in so far as they attempt, in one way or another, to decompose final transaction prices into an 'indirect tax' component and an 'other' component. The 'other' component will comprise the base price net of taxes and includes margins. While the 'indirect tax' component can be deducted, it is not possible to conclude that the 'other' component represents the price that would have been charged in the absence of indirect taxes. Changes in prices, net of the indirect taxes, will therefore include changes in margins. They will also include the flow on impact of TNTS changes working through the system.

**6.4** The ABS has focused on those options that would prove both feasible to construct and to release soon after the CPI. They also rely only on observable data on prices and published rates of indirect tax. These measures are, at best, limited to measuring the first round effects of changes in indirect taxes. None of the feasible options presented in Attachment 4 can measure the second round and subsequent (or flow-on) effects on final consumer prices of, for example, reductions in producer costs and transport margins arising from the removal of the WST and the extension of the fuel rebate scheme. The estimates of the price impact of TNTS calculated under these options is not comparable to the estimates of the price impact of the tax reform produced by the Commonwealth Treasury. The Treasury estimates go much further by incorporating estimates of the effects on final prices of second round effects: this requires extensive modelling of a type not undertaken by the ABS.

**6.5** Given the above, the ABS is unable to measure what CPI users and analysts really want—a measure of the full impact (covering first and subsequent round effects) of TNTS on consumer prices. This will be explicitly stated at the time of release of the September quarter 2000 CPI publication.



6. MEASURING THE IMPACT  
OF THE NEW TAX SYSTEM  
ON THE CPI *continued*

**6.6** On the other hand, CPI users and analysts have been almost universally supportive of the ABS 'doing something'. With the above important qualifications in mind, it has been decided to compile an *experimental constant tax rate measure* which will be published in *Australian Economic Indicators* (Cat. no. 1350.0) approximately one month after publication of the September quarter 2000 CPI, together with the qualifications that will attach to such a measure.

**6.7** More specifically:

- The experimental constant tax rate measure will take the form of providing an estimate of the proportion of the change in the published CPI attributable to tax rate changes, rather than an index number.
- The measure will only abstract from the *direct* or *first round* effects of tax changes on the prices of consumer goods and services. It will not, for example, account for the effects of changes in petroleum excise on the price of a jar of jam, but would account for the change in petrol excise on petrol purchased by households for use in their motor vehicles. Similarly, in the case of house purchase it will only account for the imposition of GST on the final price of the home (less the impact of the First Home Owners Scheme) and not for the abolition of WST on inputs to house construction.
- The constant tax rate measure will be constructed with reference to the scheduled rates of tax prevailing in June quarter 2000. This means that no allowance will be made for tax changes implemented before that quarter.

7. FURTHER INFORMATION  
ON CPI ISSUES

**7.1** Readers seeking further information on the impact of TENTS on the CPI should contact:

Mr Keith Woolford  
Director  
Prices Development  
PO Box 10  
Belconnen ACT 2616  
Telephone: (02) 6252 6673  
Facsimile: (02) 6252 8555  
Email: keith.woolford@abs.gov.au

**7.2** Readers are also advised that the ABS will be conducting a series of seminars in all capital cities on the impacts of TENTS on ABS statistics, particularly on the ABS price indexes. Further details are set out in the pamphlet included with this publication, or can be obtained from the above ABS contact officer.

## PART D: GLOSSARY OF TERMS

<b>Ad valorem tax</b>	A tax expressed in percentage terms, e.g. the rate of GST is 10%.
<b>Bank account debits tax</b>	A state tax imposed in all states and territories on taxable debits to bank accounts which can be operated by cheque or similar payment instruments. The rate varies by state/territory and amount of debit.
<b>Basic price</b>	The basic price is the amount received by the producer before the imposition of indirect taxes (less subsidies) on products and transport and trade margins. That is, it is the ex-plant price.
<b>Excise</b>	A tax expressed in specific terms (e.g. some dollar amount per unit of quantity).
<b>Financial institutions duty</b>	A State tax (applied in all states and territories except Queensland) charged on all taxable credits, including deposits, automatic credits, transfers from other accounts, interest credits and payments to loan accounts. The rate in most states/territories is 0.06% of each taxable credit amount. Also referred to as government credit tax.
<b>First Home Owners Scheme</b>	A lump sum payment to be paid to Australian citizens buying or building their first home to assist with the higher home prices resulting from the GST.
<b>Free on board (f.o.b.)</b>	A method of valuation of internationally traded goods where the goods are valued at the port of export. Any imports or customs duties that may be imposed in the country of destination are excluded as are any transport costs from the frontier of the exporting country.
<b>Goods and services tax (GST)</b>	A tax, in percentage (ad valorem) terms applied to supplies (goods and services produced or delivered) by registered suppliers engaged in taxable activity. In the main, the GST is effectively only paid by final consumers (individual persons). The legislated rate of GST is 10%.
<b>GST-free</b>	GST is not charged on the supply of an item that is GST-free, and the supplier is able to claim back the tax paid on inputs (this is sometimes referred to as zero rated). Goods and services that will be GST-free include basic food, most health services and products, education, eligible childcare, water and sewerage rates, hospital and nursing home services and local government rates.
<b>GST exempt</b>	See input taxed
<b>Indirect taxes</b>	Taxes assessed on producers and suppliers, on the production, sale, purchase or use of goods and services.
<b>Input tax credits</b>	For any item subject to GST, registered businesses are able to claim a tax credit for GST paid on purchases of business inputs.

<b>Input taxed</b>	GST does not apply on activities that are input taxed, but registered suppliers are unable to claim tax credits for GST paid on inputs (sometimes referred to as GST exempt). Residential rents and most financial supplies will be input taxed.
<b>Net tax indexes</b>	A price index that abstracts from the effects of changes in indirect taxes.
<b>Producer price indexes</b>	Producer price indexes measure the prices of goods or services moving between sectors of the domestic and international economy. Prices may be measured in either basic prices, purchasers' prices or free on board.
<b>Purchasers' price</b>	The purchasers' price is the amount paid by the purchaser inclusive of indirect taxes (less subsidies), trade margins (wholesale and retail) and transport costs. That is, it is the price for commodities or services as supplied to the purchaser.
<b>Specific tax</b>	A tax that is expressed in some dollar amount per unit of quantity, e.g. the excise on unleaded petrol at March 2000 was \$0.43485 per litre of petrol.
<b>The New Tax System (TNTS)</b>	Package of changes to the taxation and social welfare system including the introduction of a GST and the changes to business taxation announced in response to the review of business taxation (the Ralph review).
<b>Value added tax</b>	A value added type tax (VAT) is a tax on goods and services collected in stages by enterprises but which is ultimately charged in full to the final purchaser (i.e. householder).
<b>Wholesale sales tax (WST)</b>	An ad valorem tax that applies to various goods at the last point of wholesale supply. For items subject to WST, the retailer is charged a price inclusive of WST by wholesalers and thus the WST is passed on to consumers. Rates of WST are zero (e.g. basic food), 12% (e.g. most whitegoods), the general rate of 22% (e.g. TVs, musical instruments, computers), 32% (e.g. jewellery), 41% (wine) and 45% (luxury cars).
<b>Zero rated</b>	See GST-free

## ATTACHMENT 1: TIMELINE FOR THE NEW TAX SYSTEM RELEVANT TO ABS PRICE INDEXES

Date	Event
8 July 1999	Royal assent to the GST bill. Contracts for supplies extending beyond 1 July 2000 liable to GST for the period beyond 1 July 2000.
29 July 1999	First phase of WST abolition with the taxes on most goods previously taxed at 32% (including tape recorders, televisions, cameras, clocks and watches) reduced to 22%.
1 November 1999	Introduction of a per stick rate of duty on tobacco products.
1 July 2000	<p>Abolition of WST.</p> <p>Commencement of 10% GST.</p> <p>Introduction of luxury car tax (replaces the 45% WST).</p> <p>Excise rates on petrol and diesel reduced.</p> <p>Excise duty on alcoholic beverages other than wine will be increased to offset the removal of WST.</p> <p>Commencement of Wine Equalisation Tax of 29% (replaces 41% WST).</p> <p>Personal income tax cuts through a reduction in the tax free threshold, a cut in all marginal rates except the top rate and adjustments to income tax thresholds.</p> <p>Payment of the Aged Persons Savings Bonus and Self-Funded Retirees Supplementary bonus to eligible persons.</p> <p>Increases in social security and veterans pensions and allowances (by 4%), student income support payments and adjustment of income tests.</p> <p>Increase in the maximum rate of rent assistance by 7%.</p> <p>Extension of Family Tax Initiative, easing of the income test for family allowances and increases in the maximum level of assistance for child care.</p> <p>State bed taxes abolished.</p>
1 July 2001	<p>Financial institutions duty abolished.</p> <p>Stamp duties on quoted marketable securities abolished.</p>
before 1 July 2005	State debits tax abolished.

## ATTACHMENT 2: CALCULATING THE AUSTRALIAN CPI AND THE ROLE OF WEIGHTS

- 1.** The CPI comprises a series of short-term price indexes that are 'chain linked' together to form a continuous long-term series. This approach allows changes in expenditure patterns to be reflected in the CPI. The CPI now comprises 13 linked indexes with the 14th planned to be introduced in September quarter 2000.
- 2.** Each CPI series is constructed as a fixed, base weighted (or modified Laspeyres) index. Each series can be thought of as measuring the changing cost of a fixed basket of goods and services where the quantities of each item in the basket are fixed. If the items in the basket are priced each quarter, then, as prices change from one quarter to the next, so too will the total price of the basket. Each series is simply a measure of the changes in the price of a fixed basket as the prices of items in it change.
- 3.** These short-term series are linked together in such a way that the resulting continuous series reflects only pure price change and not differences in the baskets underlying each series.
- 4.** Although the weights that are fixed for the duration of a series are quantity weights, there is no meaningful way of directly presenting relative quantity weights (e.g. 2/3rds of a motor car and 3 dozen oranges). The only meaningful way of describing the relative importance of items in the CPI basket is in terms of relative values or expenditures (e.g. \$5,000 on motor vehicles and \$100 on oranges). Each time a new CPI series is introduced, the relative importance of items in the basket is published as a set of expenditure weights expressed in terms of the prices prevailing in the series base period (i.e. the period at which it is linked to the previous series). The relative importance of items expressed in value terms changes over the life of a series in response to variations in price movements, but the underlying quantities remain fixed.
- 5.** Failure to appropriately distinguish between quantity and value weights (i.e. using quantity when value should be used and vice versa) is arguably the single greatest source of error in price index construction. The following simplified mathematical notation is provided to illustrate:

  - the relationship between quantity and value weights;
  - the approach actually used to compile the CPI;
  - the linking process; and
  - the weight changes that are relevant for the CPI.

Basic formula **6.** Although the Australian CPI is constructed using the ‘modified’ Laspeyres formula, the ‘modifications’ are not germane to the first component of the issue being considered here, so the starting point is the version of the Laspeyres index number formula most commonly encountered in price index literature:

$$I_t = \frac{\sum_N Q_{0,N} \times P_{t,N}}{\sum_N Q_{0,N} \times P_{0,N}} \times 100 \quad (1)$$

where:

$I_t$  is the index number in period  $t$  with period 0 as the base;

$Q_{0,N}$  is the quantity of item  $N$  purchased in period 0;

$P_{0,N}$  is the price of item  $N$  in period 0;

$P_{t,N}$  is the price of item  $N$  in period  $t$ ; and

$\sum_N$  is the sum over the  $N$  items included in the index.

From this expression, it is clear that the denominator represents ‘total expenditure on (or value of) the basket in the base period’ (which can be designated  $E_{0,0}$ ) while the numerator can be interpreted as ‘the value of the identical basket in period  $t$ ’ (which can be designated  $E_{0,t}$ ).

Now, ignoring the item notation, equation (1) can be used to derive an index for the base period (i.e. where  $t=0$ ) as follows:

$$I_0 = \frac{\sum Q_0 \times P_0}{\sum Q_0 \times P_0} \times 100 = 100$$

The index number for period 1 can be derived as:

$$I_1 = I_0 \times \frac{\sum Q_0 \times P_1}{\sum Q_0 \times P_0}$$

Similarly, the index for period 2 is given by:

$$I_2 = I_1 \times \frac{\sum Q_0 \times P_2}{\sum Q_0 \times P_1}$$

Then, the generalised expression becomes:

$$I_t = I_{t-1} \times \frac{\sum Q_0 \times P_t}{\sum Q_0 \times P_{t-1}} \quad (2)$$

Thus, the index for time  $t$  can be calculated as the index for time  $t-1$  multiplied by the change in the total basket cost between period  $t-1$  and period  $t$ . Multiplying the numerator of the second expression in (2) by  $P_{t-1} / P_{t-1}$  and rearranging gives the following:

$$\sum Q_0 \times P_t = \sum Q_0 \times P_{t-1} \times \frac{P_t}{P_{t-1}} \quad (3)$$

Basic formula *continued* Inserting (3) into (2) gives:

$$I_t = I_{t-1} \times \frac{\sum Q_0 \times P_{t-1} \times \frac{P_t}{P_{t-1}}}{\sum Q_0 \times P_{t-1}} \quad (4)$$

which is a somewhat simplified version of the procedure used to calculate the Australian CPI. The current period value of the underlying base period quantities is estimated, item by item, by revaluing previous period expenditure by the ratio of the current price to the previous period price and then summing over all items.

Note also that the second expression in (4) can be rearranged to:

$$\sum \left( \frac{Q_0 \times P_{t-1}}{\sum Q_0 \times P_{t-1}} \right) \times \frac{P_t}{P_{t-1}}$$

Where the term in parentheses is the Nth item's expenditure weight in period t-1.

**7.** The key points from the above are:

- quantity weights are used to weight prices;
- value (or expenditure) weights are used to weight price relatives (indexes or movements); and
- while underlying quantity weights remain fixed for the life of a series, expenditure weights change in response to dispersions in price movements.

Linking **8.** When one series is linked to another, the index for the period immediately after the link period is calculated as follows:

$$I_{L+1} = I_L \times \frac{\sum Q_L \times P_L \times \frac{P_{L+1}}{P_L}}{\sum Q_L \times P_L} \quad (5)$$

or in terms of equation (1);

$$I_{L+1} = \frac{\sum Q_0 \times P_L}{\sum Q_0 \times P_0} \times \frac{\sum Q_L \times P_{L+1}}{\sum Q_L \times P_L} \times 100$$

Which can be rearranged and generalised as:

$$I_{L+t} = \frac{\sum Q_0 \times P_L}{\sum Q_L \times P_L} \times \frac{\sum Q_L \times P_{L+t}}{\sum Q_0 \times P_0} \times 100 \quad (6)$$

where the first term is a 'linking' factor which can be seen to be the ratio of the cost of the base period basket at link period prices to the cost of the new basket at link period prices — as these are two 'constant price' values, the link factor is a function of relative quantities only.



Linking *continued*

**9.** The key points from the above are:

- that linking involves using one set of weights to measure price change up to and including the link period, and another set to measure price change from the link period forward;
- where value weights are to be used to weight price movements, they must be calculated at prices prevailing in the period used as the denominator in the price change expression; and
- therefore, the effective change in value weights is computed by comparing the relative values of the old and new quantities at the prices prevailing in the link period.

Practical illustration

**10.** To illustrate the above consider the following data for a two commodity universe in three time periods.

Item	Period 0				Period 1					Period 2		
	Q <sub>0</sub>	P <sub>0</sub>	E <sub>0</sub>	W <sub>0</sub>	Q <sub>1</sub>	P <sub>1</sub>	E <sub>1</sub>	W <sub>1</sub>	P <sub>1</sub> /P <sub>0</sub>	P <sub>2</sub>	P <sub>2</sub> /P <sub>1</sub>	P <sub>2</sub> /P <sub>0</sub>
A	10	3	30	0.5	20	4	80	0.4	1.33	6	1.50	2.00
B	15	2	30	0.5	30	4	120	0.6	2.00	5	1.25	2.50
Total			60	1.0			200	1.0				

The index for period 1 can be computed using (1) as:

$$\begin{aligned}
 I_1 &= [(10 \times 4) + (15 \times 4)] / [(10 \times 3) + (15 \times 2)] \times 100 \\
 &= [40 + 60] / [30 + 30] \times 100 \\
 &= 100/60 \times 100 \\
 &= 166.7
 \end{aligned}$$

Or, using period 0 expenditure weights (W<sub>0</sub>), as:

$$\begin{aligned}
 I_1 &= 100 \times [(0.5 \times 1.33) + (0.5 \times 2.00)] \\
 &= 100 \times [0.665 + 1.00] \\
 &= 166.7 \quad (\text{allowing for rounding})
 \end{aligned}$$

The index for period 2, using updated expenditure weights for period 1, is given as:

$$\begin{aligned}
 I_2 &= 166.7 \times [(0.4 \times 1.5) + (0.6 \times 1.25)] \\
 &= 166.7 \times 1.35 \\
 &= 225.0
 \end{aligned}$$

The index for period 2, using period 0 weights is:

$$\begin{aligned}
 I_2 &= 100 \times [(0.5 \times 2.00) + (0.5 \times 2.50)] \\
 &= 100 \times 2.25 \\
 &= 225.0
 \end{aligned}$$

Although the nominal expenditure weights have changed (from 0.5 and 0.5 to 0.4 and 0.6), the relative underlying quantity shares are unaltered so the effective index weights are unchanged.

CPI weights in practice **11.** CPI weights are generally updated at approximately five yearly intervals with timing largely linked to the running of the HES and the degree of public consultation required. Historically, the new weights have been introduced to the CPI with a lag of approximately three years following the HES reference period (e.g. weights based on the 1988–89 HES were introduced in September quarter 1992). Contributing to the delay in updating weights has been the analysis undertaken to minimise item substitution bias and ensure the weights are as representative as possible of the expenditure patterns that will be in force during the life of the series rather than strictly mirroring a pattern that happened to exist in some prior period. In discussing the issue of bias in the CPI prior to the last CPI review (paragraph 23, Appendix 2 to *Information Paper: Issues to be Considered During the 13th Series Australian Consumer Price Index Review* (Cat. no. 6451.0), it was noted that:

“...the ABS employs a number of strategies to minimise item substitution bias. First, the results of the HES are not just taken at face value and input to the CPI. The results are subject to extensive analysis both to correct for any under reporting and to correct for any aberrations in expenditure during the HES survey year. These latter corrections are also targeted at identifying any emerging trends in consumption with a view to refining the HES estimates to reflect a ‘normal’ level of expenditure likely to be more representative of future rather than past expenditure patterns. While such adjustments clearly involve a degree of subjectivity, the ABS has long been of the view that the adjustments are warranted.”

**12.** The existence of the lag in introduction and the fact that the weights need not reflect an historical ‘truth’, explains why the formula used to construct the Australian CPI is referred to as ‘modified’ Laspeyres.

## ATTACHMENT 3: A COMPARISON OF THE 13TH SERIES AND PROPOSED 14TH SERIES CPI COMMODITY CLASSIFICATIONS

### CPI 13th series

Group, subgroup, expenditure class

<b>ALL GROUPS</b>	
<b>1</b>	<b>FOOD</b>
1.1	Dairy and related products
1.1.1	Milk and cream
1.1.2	Cheese
1.1.3	Other dairy products
1.2	Cereal products
1.2.1	Bread
1.2.2	Cakes and biscuits
1.2.3	Breakfast cereals
1.2.4	Other cereal products
1.3	Meat and seafoods
1.3.1	Beef and veal
1.3.2	Lamb and mutton
1.3.3	Pork
1.3.4	Poultry
1.3.5	Bacon and ham
1.3.6	Processed meat
1.3.7	Fish and other seafood
1.4	Fresh fruit and vegetables
1.4.1	Fresh fruit
1.4.2	Fresh vegetables
1.5	Processed fruit and vegetables
1.5.1	Processed fruit
1.5.2	Processed vegetables
1.5.3	Fruit and vegetable juices
1.6	Soft drinks, ice cream and confectionery
1.6.1	Soft drinks and cordials
1.6.2	Ice cream and ice confectionery
1.6.3	Sweet and savoury snacks
1.7	Meals out and take away foods
1.7.1	Restaurant meals
1.7.2	Take away and fast foods
1.8	Other food
1.8.1	Eggs
1.8.2	Jams, honey and sandwich spreads
1.8.3	Tea, coffee and food drinks
1.8.4	Food additives and condiments
1.8.5	Fats and oils
1.8.6	Food n.e.c.

### Proposed 14th Series

Group, subgroup, expenditure class

<b>ALL GROUPS</b>	
<b>1</b>	<b>FOOD</b>
1.1	<i>Dairy and related products</i>
1.1.1	<i>Milk</i>
1.1.2	Cheese
1.1.3	<i>Ice cream and other dairy products</i>
1.2	Cereal products
1.2.1	Bread
1.2.2	Cakes and biscuits
1.2.3	Breakfast cereals
1.2.4	Other cereal products
1.3	Meat and seafoods
1.3.1	Beef and veal
1.3.2	Lamb and mutton
1.3.3	Pork
1.3.4	Poultry
1.3.6	Bacon and ham
1.3.7	<i>Other fresh and processed meat</i>
1.3.8	Fish and other seafood
1.4	<i>Fruit and vegetables</i>
1.4.1	<i>Fruit</i>
1.4.2	<i>Vegetables</i>
1.5	<i>Non alcoholic drinks, confectionery and snacks</i>
1.5.1	<i>Soft drinks, waters and juices</i>
1.5.2	<i>Ice confectionery and sweet and savoury snacks</i>
1.6	Meals out and take away foods
1.6.1	Restaurant meals
1.6.2	Take away and fast foods
1.7	Other food
1.7.1	Eggs
1.7.2	Jams, honey and sandwich spreads
1.7.3	Tea, coffee and food drinks
1.7.4	Food additives and condiments
1.7.5	Fats and oils
1.7.6	Food n.e.c.
<b>2</b>	<b>ALCOHOL AND TOBACCO</b>
2.1	Alcoholic drinks
2.1.1	Beer
2.1.2	Wine
2.1.3	Spirits
2.2	<i>Tobacco</i>
2.2.1	<i>Tobacco</i>

**CPI 13th series**

Group, subgroup, expenditure class

<b>2</b>	<b>CLOTHING</b>
2.1	Men's clothing
2.1.1	Men's outerwear
2.1.2	Men's shirts
2.1.3	Men's underwear, nightwear and socks
2.2	Women's clothing
2.2.1	Women's outerwear
2.2.2	Women's underwear, nightwear and hosiery
2.3	Children's and infants' clothing
2.3.1	Boys' clothing
2.3.2	Girls' clothing
2.4	Footwear
2.4.1	Men's footwear
2.4.2	Women's footwear
2.4.3	Children's footwear
2.5	Clothing accessories, supplies and services
2.5.1	Accessories
2.5.2	Fabrics and knitting wool
2.5.3	Clothing services and shoe repair

**3 HOUSING**

3.1	Rents
3.1.1	Privately-owned dwelling rents
3.1.2	Government-owned dwelling rents
3.2	Utilities
3.2.1	Electricity
3.2.2	Gas
3.2.3	Other household fuel
3.2.4	Water and sewerage
3.3	Other housing
3.3.1	House purchase
3.3.2	Property rates and charges
3.3.3	House repairs and maintenance
3.3.4	House insurance

**4 HOUSEHOLD EQUIPMENT AND OPERATION**

4.1	Furniture and floor coverings
4.1.1	Furniture
4.1.2	Floor coverings
4.2	Household textiles
4.2.1	Bedding
4.2.2	Towels, linen and curtains
4.3	Household appliances, utensils and tools
4.3.1	Appliances
4.3.2	Tableware, glassware and cutlery
4.3.3	Household utensils

**Proposed 14th Series**

Group, subgroup, expenditure class

<b>3</b>	<b>CLOTHING AND FOOTWEAR</b>
3.1	Men's clothing
3.1.1	<i>Men's outerwear</i>
3.1.2	Men's underwear, nightwear and socks
3.2	Women's clothing
3.2.1	Women's outerwear
3.2.2	Women's underwear, nightwear and hosiery
3.3	Children's and infants' clothing
3.3.1	<i>Children's and infants' clothing</i>
3.4	Footwear
3.4.1	Men's footwear
3.4.2	Women's footwear
3.4.3	Children's footwear
3.5	Clothing accessories, supplies and services
3.5.1	<i>Clothing accessories and jewellery</i>
3.5.2	Fabrics and knitting wool
3.5.3	Clothing services and shoe repair

**4 HOUSING**

4.1	Rents
4.1.1	<i>Rents</i>
4.2	Utilities
4.2.1	Electricity
4.2.2	<i>Gas and other household fuels</i>
4.2.3	Water and sewerage
4.3	<i>Other housing</i>
4.3.1	House purchase
4.3.2	Property rates and charges
4.3.3	House repairs and maintenance

**5 HOUSEHOLD FURNISHINGS, SUPPLIES AND SERVICES**

5.1	<i>Furniture and furnishings</i>
5.1.1	Furniture
5.1.2	<i>Floor and window coverings</i>
5.1.3	<i>Towels and linen</i>
5.2	Household appliances, utensils and tools
5.2.1	<i>Major household appliances</i>
5.2.2	<i>Small electric household appliances</i>
5.2.3	<i>Glassware, tableware and household utensils</i>

**CPI 13th series**

Group, subgroup, expenditure class

- 4.3.4 Tools
- 4.4 Household supplies
  - 4.4.1 Household cleaning agents
  - 4.4.2 Pet foods, pets and supplies
  - 4.4.3 Other household supplies
- 4.5 Household services
  - 4.5.1 Pet services including veterinary
  - 4.5.2 House contents insurance
  - 4.5.3 Repairs to household durables
  - 4.5.4 Domestic services
- 4.6 Postal and communication services
  - 4.6.1 Postal services
  - 4.6.2 Communication services

**5 TRANSPORTATION**

- 5.1 Private motoring
  - 5.1.1 Motor vehicles
  - 5.1.2 Automotive fuel
  - 5.1.3 Vehicle insurance
  - 5.1.4 Motor vehicle repair and servicing
  - 5.1.5 Motor vehicle parts and accessories
  - 5.1.6 Other motoring charges
- 5.2 Urban transport fares
  - 5.2.1 Urban transport fares

**6 ALCOHOL AND TOBACCO**

- 6.1 Alcoholic drinks
  - 6.1.1 Beer
  - 6.1.2 Wine
  - 6.1.3 Spirits
- 6.2 Cigarettes and tobacco
  - 6.2.1 Cigarettes and tobacco

**7 HEALTH AND PERSONAL CARE**

- 7.1 Health services
  - 7.1.1 Hospital and medical services
  - 7.1.2 Optical services
  - 7.1.3 Dental services
- 7.2 Personal care products
  - 7.2.1 Pharmaceuticals
  - 7.2.2 Toiletries and personal products
- 7.3 Hairdressing and personal care services
  - 7.3.1 Hairdressing and personal care services

**Proposed 14th Series**

Group, subgroup, expenditure class

- 5.2.4 Tools
- 5.3 Household supplies
  - 5.3.1 Household cleaning agents
  - 5.3.2 Other household supplies
- 5.4 *Household services*
  - 5.4.1 *Household services*

**6 HEALTH**

- 6.1 Health services
  - 6.1.1 Hospital and medical services
  - 6.1.2 Optical services
  - 6.1.3 Dental services
- 6.2 *Pharmaceuticals*
  - 6.2.1 Pharmaceuticals

**7 TRANSPORTATION**

- 7.1 *Private motoring*
  - 7.1.1 Motor vehicles
  - 7.1.2 Automotive fuel
  - 7.1.3 Motor vehicle repair and servicing
  - 7.1.4 Motor vehicle parts and accessories
  - 7.1.5 Other motoring charges
- 7.2 Urban transport fares
  - 7.2.1 Urban transport fares

**CPI 13th series**  
Group, subgroup, expenditure class

**8 RECREATION AND EDUCATION**

- 8.1 Books, newspapers, magazines and stationery
  - 8.1.1 Books
  - 8.1.2 Newspapers and magazines
  - 8.1.3 Stationery
- 8.2 Recreation
  - 8.2.1 Audio, visual and computing equipment
  - 8.2.2 Audio, visual and computing media and services
  - 8.2.3 Sports and recreational equipment
  - 8.2.4 Toys, games and hobbies
  - 8.2.5 Repairs to recreational goods
  - 8.2.6 Sports participation
- 8.2.7 Other recreational activities
- 8.3 Holiday travel and accommodation
  - 8.3.1 Domestic holiday travel and accommodation
  - 8.3.2 Overseas holiday travel and accommodation
- 8.4 Education and child care
  - 8.4.1 Education
  - 8.4.2 Child care

**Proposed 14th Series**  
Group, subgroup, expenditure class

**8 COMMUNICATION**

- 8.1 Communication
  - 8.1.1 *Postal and delivery*
  - 8.1.2 *Telecommunication*

**9 RECREATION**

- 9.1 *Audio, visual and computing*
  - 9.1.1 Audio, visual and computing equipment
  - 9.1.2 *Audio, visual and computing media and services*
- 9.2 *Reading material*
  - 9.2.1 Books
  - 9.2.2 Newspapers and magazines
- 9.3 *Sport and other recreation*
  - 9.3.1 Sports and recreational equipment
  - 9.3.2 Toys, games and hobbies
  - 9.3.3 Sports participation
  - 9.3.4 Pets, pet foods and supplies
  - 9.3.5 Pet services including veterinary
  - 9.3.7 Other recreational activities
- 9.4 Holiday travel and accommodation
  - 9.4.1 Domestic holiday travel and accommodation
  - 9.4.2 Overseas holiday travel and accommodation

**10 EDUCATION**

- 10.1 Education
  - 10.1.1 *Pre-primary and primary education*
  - 10.1.2 *Secondary education*
  - 10.1.3 *Tertiary education*

**11 INSURANCE AND FINANCIAL SERVICES**

- 11.1 *Insurance services*
  - 11.1.1 *Insurance services*
- 11.2 *Financial services*
  - 11.2.1 *Financial services*

**12 MISCELLANEOUS**

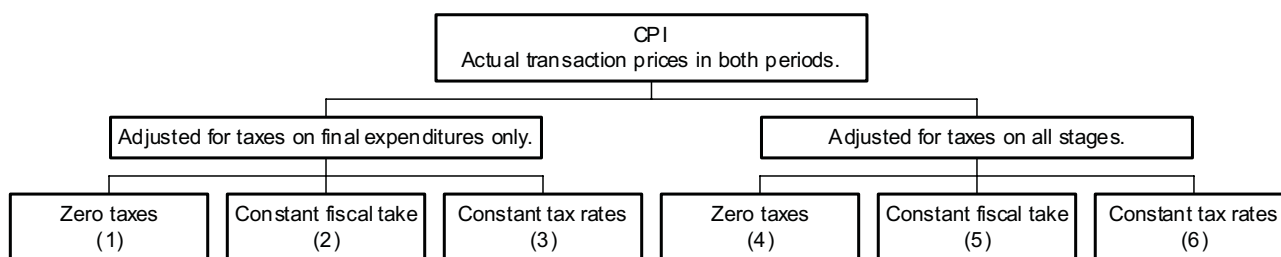
- 12.1 *Personal care*
  - 12.1.1 Hairdressing and personal care services
  - 12.1.2 Toiletries and personal care products
- 12.2 Child care
  - 12.2.1 Child care
- 12.3 *Other goods and services*
  - 12.3.3 *Other goods and services*

**Note:** Items shown in italics under the proposed 14th series commodity classification indicate changes from the 13th series. These mainly reflect changes in commodity coverage.

## ATTACHMENT 4: POSSIBLE OPTIONS FOR ASSESSING THE IMPACT OF THE NEW TAX SYSTEM ON THE CPI

- Summary
1. The CPI measures changes in the final transaction prices paid by households for goods and services. By definition, the final transaction prices include any indirect taxes levied on goods and services during production and distribution. Measures of changes in commodity prices that abstract in some way from the effects of changes in indirect taxes are referred to as 'net tax indexes'.
  2. The ABS first proposed producing this type of index in *Information Paper: An Analytical Framework for Price Indexes in Australia* (Cat. no. 6421.0) published in February 1997. The ability to abstract from changes in indirect taxes was presented as a key element of a proposed measure of underlying inflation for the household sector.
  3. There is no single net tax index. This attachment sets out the conceptual alternatives for constructing such a measure to assist in assessing the impact of TSTS on the CPI. The key objective is to produce a measure that assists in the decomposition of sources of price change to enable that element of price change attributable to indirect taxes to be separately identifiable. As a net tax index abstracts from changes in indirect taxes, what is of interest is the difference between the net tax index and the CPI.
  4. While this attachment touches on all possible conceptual options, the focus is on those options that would both prove feasible to construct and to release soon after the CPI. These options are characterised by their reliance only on observable or published data on prices and rates of indirect tax. As such, *these measures are, at best, limited to measuring the first round effects of changes in indirect taxes*. None of the feasible options presented can measure the second round and subsequent (or flow-on) effects on final consumer prices of, for example, reductions in producer costs and transport margins arising from removal of the WST and the extension of the diesel fuel rebate scheme. They should not therefore, be seen as comparable to the estimates of the price impact of the tax reform produced by the Commonwealth Treasury. The Treasury estimates go much further by incorporating estimates of the effects on final prices of changes in taxes on intermediate inputs.
  5. The structure of the existing indirect tax system (specifically the existence of ad valorem wholesale sales tax) limits what can be done in the period spanning introduction of reform to the 'constant tax rate' option. The preferred 'constant fiscal take' option could only be adopted after ad valorem wholesale sales taxes are abolished (or at least reduced to a negligible incidence).

The Options **6.** Donkers et al (1989)<sup>1</sup>, identified six major options for abstracting from indirect taxes in the context of a consumer price index. These options are set out below:



**7.** The first decision point is whether the measure should abstract only from taxes levied on those goods and services appearing in final expenditures or whether it should also abstract from taxes levied on intermediate inputs used in their production. The former would abstract from changes in say fuel taxes on the price of fuel while the latter would also account for the impact of changes in fuel taxes on the price of jam. The former is often referred to as a measure that removes first round effects only while the latter also accommodates second and subsequent round effects.

**8.** While a measure that abstracts from changes in all taxes would be of most value over a period involving substantial restructuring of the indirect tax system, measures of this type cannot be constructed by reference to readily available data on prices and tax rates alone. Extensive modelling is required to allocate taxes on intermediate inputs like office supplies to final expenditures.

**9.** The remainder of this attachment therefore focuses only on those options that abstract from taxes on final expenditures (options 1 to 3 above).

*Zero taxes* **10.** This option involves constructing a measure based on prices from which taxes have been removed in both the base period and the reference period.

**11.** If the measure removed all taxes (including those on intermediate inputs), it would represent a measure of price change at factor cost. By only removing taxes on final expenditures, this option provides a measure of changes in the prices of the remaining elements (in simple terms, production costs and margins).

<sup>1</sup> Donkers, H.W.J., Byerregoorol Jensen, J., Hyrkkö, J., Lehtinen, T., Murphy, D.C., Stolpe, G., and Turvey, R., "Adjusting the CPI for indirect taxes", in Consumer Price Indices: An ILO manual, ed. Ralph Turvey, International Labour Office, Geneva, 1989, pp139-145.



Zero taxes  
continued

**12.** A measure of this type best captures changes in production costs and margins alone. Ignoring the restriction to first round taxes, this measure can simplistically be said to answer the question<sup>2</sup> *By how much would the CPI have increased if there were no taxes on products in either the base period or the current period?* However, the removal of taxes from both the base and comparison periods results in the relative expenditure weights of items in the net index being different from those in the headline measure. This makes it difficult, if not impossible, to precisely interpret the difference between movements in the net tax index and the CPI. Thus a measure of this type is, by itself, not particularly useful in shedding light on the contribution of commodity taxes to aggregate price change.

**13.** A measure of this type is constructed in the United Kingdom.

Constant fiscal take

**14.** This option involves constructing a measure that keeps the amount of tax collected constant. No adjustment to base period prices is required. Comparison period prices are adjusted to reflect the amount of tax collected in the base period (i.e. the amount of tax collected in the comparison period is subtracted, and the amount of tax collected in the base period is added).

**15.** A measure of this type provides a consistent means of decomposing price change at the individual commodity and the aggregate index level. For example, if final prices comprise three elements; production costs, margins and taxes, then a measure that holds one of these elements constant can be compared with the headline measure to derive the relative contribution of the constant element to aggregate price change. A measure of this type can be said to answer the question *By how much would the CPI have increased if the amount of tax levied on products had not changed?* It therefore follows that the difference between this measure and the CPI equals the contribution of changing tax amounts to the overall movement in the CPI.

**16.** A measure of this type is constructed in Ireland.

Constant tax rate

**17.** This option involves constructing a measure that keeps the explicit (or published) tax rates constant. No adjustment to base period prices is required. Comparison period prices are adjusted to reflect the amount of tax that would have been collected in the comparison period had the base period tax rates been in force.

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<sup>2</sup> All the questions the various net tax indexes can be said to answer in this attachment are 'simplistic' in so far as in reality, the removal of one component (or holding constant one component) of final prices would result in different behaviour by economic agents (producers, distributors and consumers) such that the actual prices observed under such conditions would differ from those constructed by these methods. The degree of difference is of course a matter of conjecture.

Constant tax rate  
continued

**18.** While interpretation of this type of measure is consistent and straightforward, it is not as pure a price measure as the fiscal take option as it effectively treats 'rates' as prices. As such, this may be seen as being at best a proxy for the constant fiscal take option. Nevertheless, the measure can be said to specifically answer the question *By how much would the CPI have increased if the tax rates on products had not changed?* The difference between this measure and the CPI shows the contribution of changing tax rates to the overall movement in the CPI.

**19.** A measure of this type is constructed in the Netherlands.

Illustration of the differences  
between the three options

**20.** Commodity taxes may be either specific (levied at some dollar amount per unit) or ad valorem (levied at some rate on the transaction price). To illustrate the differences between the options, use is made of a two commodity index where one commodity is tax free and the other is subject either to a specific tax (first example) or to an ad valorem tax (second example). In the case of the ad valorem tax, the tax is assumed to apply to the final transaction price (i.e. on the retail rather than the wholesale price).

**21.** Table A provides a worked example showing options for estimating the impact of a specific tax change on prices.

TABLE A: OPTIONS FOR ESTIMATING THE IMPACT OF A SPECIFIC TAX CHANGE ON PRICES.

<b>Input data:</b>					
<i>Base period</i>					
Commodity	Price	Quantity	Tax rate (\$ per unit)		
A	20	500	0		
B	100	100	40		
<i>Comparison period</i>					
Commodity	Price	Tax rate (\$ per unit)			
A	22	0			
B	120	45			
<b>Derived data:</b>					
<i>Base period</i>					
Commodity	$E_0$ (exp)	$T_0$ (tax)	$E_0 - T_0$		
A	10 000	0	10 000		
B	10 000	4 000	6 000		
Total	20 000		16 000		
<i>Comparison Period</i>					
Commodity	$E_1$ (exp)	$T_1$ (tax)	$E_1 - T_1$	$E_1 - T_1 + T_0$	$E_1$ at $T_0$
A	11 000	0	11 000	11 000	11 000
B	12 000	4 500	7 500	11 500	11 500
Total	23 000		18 500	22 500	22 500
<b>Indexes:</b>					
Commodity	Headline	Zero tax	Constant fiscal take	Constant tax rate	
A	110.0	110.0	110.0	110.0	
B	120.0	125.0	115.0	115.0	
Total	115.0	115.6	112.5	112.5	

*Illustration of the differences  
between the three options  
continued*

**22.** In looking at the above example, the items of interest are the index numbers presented in the last two rows. How do we interpret these numbers?

**23.** First, for commodity B we can say that:

- the final transaction price increased by 20% (headline);
- production costs and margins (combined) increased by 25% (zero tax); and
- the change in tax between the two periods accounted for 25% of the total observed price change  $[(20-15)/20]$  (the difference between movements in the constant fiscal take and headline measures as a percentage of the movement in the headline measure), or conversely, changes in costs and margins accounted for 75% of the total change.

**24.** Similarly, at the aggregate level we can say that:

- final prices increased by 15% on average (headline);
- production costs and margins increased by 15.6% (zero tax); and
- tax change accounted for 16.7% of the total change  $[(15-12.5)/15]$  (the difference between constant fiscal take and headline), or conversely changes in costs and margins accounted for 83.3%.

**25.** The important points to note are:

- a) that if taxes are of the specific kind only, then a constant fiscal take measure delivers the same result as a constant tax rate measure; and
- b) that while each measure provides useful insights, only the latter two provide for a direct decomposition of the headline measure.

**26.** Table B provides a worked example showing options for estimating the impact of an *ad valorem* tax change on prices.

TABLE B: OPTIONS FOR ESTIMATING THE IMPACT OF AN AD VALOREM TAX CHANGE ON PRICES.

<b>Input data:</b>					
<i>Base period</i>					
Commodity	Price	Quantity	Tax rate		
A	20	500	0		
B	100	100	0.4		
<i>Comparison period</i>					
Commodity	Price	Tax rate			
A	22	0			
B	120	0.45			
<b>Derived data:</b>					
<i>Base period</i>					
Commodity	$E_0$ (exp)	$T_0$ (tax)	$E_0 - T_0$		
A	10 000	0	10 000		
B	10 000	2 857	7 143		
Total	20 000		17 143		
<i>Comparison Period</i>					
Commodity	$E_1$ (exp)	$T_1$ (tax)	$E_1 - T_1$	$E_1 - T_1 + T_0$	$E_1$ at $T_0$
A	11 000	0	11 000	11 000	11 000
B	12 000	3 724	8 276	11 133	11 586
Total	23 000		19 276	22 133	22 586
<b>Indexes:</b>					
Commodity	Headline	Zero tax	Constant fiscal take	Constant tax rate	
A	110.0	110.0	110.0	110.0	
B	120.0	115.9	111.3	115.9	
Total	115.0	112.4	110.7	112.9	

**27.** How do we interpret these results?

**28.** First, for commodity B we can say that:

- the final transaction price increased by 20% (headline);
- production costs and margins (combined) increased by 15.9% (zero tax);
- a change in the tax take accounted for 43.5% of the total change  $[(20-11.3)/20]$  (the difference between movements in the constant fiscal take and headline measure as a percentage of the movement in the headline measure), or conversely, changes in costs and margins accounted for 56.5% of the total change; and
- an explicit change in the tax rate accounted for 20.5% of the total change  $[(20-15.9)/20]$  (the difference between the movement in the constant tax rate and the headline measure as a percentage of the movement in the headline measure).

*Illustration of the differences  
between the three options  
continued*

**29.** Similarly, at the aggregate level we can say that:

- final prices increased by 15% on average (headline);
- production costs and margins (combined) increased by 12.4% (zero tax);
- changes in the tax take accounted for 28.7% of the total change [(15–10.7)/15], with changes in costs and margins accounting for 71.3%; and
- explicit changes in tax rates accounted for 14% of the total change [(15–12.9)/15].

**30.** The important points to note are:

- a) that if taxes are of the ad valorem kind only, then a constant tax rate measure delivers the same result as a zero tax measure at the individual commodity level (but not at the aggregate level);
- b) the constant fiscal take option delivers a different result to the constant tax rate option (the constant tax rate option fails to take account of the ‘fiscal drag’ effect); and
- c) that while each measure provides useful insights, only the latter two provide for a direct decomposition of the headline measure.

Which Option is Best?

**31.** At a conceptual level there is no doubt that a case could be made for the adoption of any one of these measures (as evidenced by the practices of national statistical agencies). As each option answers a different question, the ideal solution might be to construct three measures. However, as this would be expensive (and possibly confusing to CPI users), the selection of a preferred measure should be based on an assessment of the principal use expected to be made of the measure.

**32.** Two broad level uses of net tax indexes can be identified. One, to measure changes in the costs (exclusive of commodity taxes) and margins of producers and distributors of consumer goods and services. Two, to decompose rates of observed price change into a ‘tax’ and an ‘other’ component. The first use would be best met by a zero tax measure; the second by either a constant fiscal take measure or a constant tax rate measure.

**33.** ABS is of the view that most CPI users and analysts are interested in gaining an insight into the effect that changes in commodity taxes have on changes in observed prices. If this is indeed the case, then the choice set can be restricted to the constant fiscal take and constant tax rate options.

Which Option is Best?

*continued*

**34.** There is a conceptual objection to a constant rate measure in a price index context. By holding explicit tax rates constant, the measure suffers from an internal inconsistency in so far as specific taxes are treated differently to ad valorem taxes. While specific taxes are treated correctly as a 'price' (i.e. some dollar amount per unit of quantity), ad valorem taxes are treated as if a 'percentage rate' is a price.

A consequence of this is that the effects of taxes are limited to those occasions when there is an explicit change in published tax schedules. Although this is precisely what some index users require, it has the effect of distorting the proportion of total price change due to tax (see paragraphs 28 and 29 above).

**35.** The preferred option is the internally consistent constant fiscal take approach. This correctly apportions the final transactions price in both periods between that amount collected as tax and that amount retained by the supplier chain. As a result, any increase in the tax take resulting solely from an increase in the price before tax (i.e. with no change in published tax scales) is captured.

**36.** There is however, the practical issue of the treatment of the wholesale sales tax that must be considered.

**37.** In constructing a constant fiscal take index, final market prices ( $p$ ) are viewed as comprising some base price net of margins and tax ( $b$ ) plus margins ( $m$ ) plus product taxes ( $t$ ). That is  $p = b + m + t$  (where there may be several instances of  $m$  and or  $t$  depending on the number of points in the production/distribution chain). Calculation of the index requires estimation of the amount of tax collected in both the base and current periods (at the tax rates prevailing in the respective periods). Provided final transaction prices can be calculated on an equivalent unit of quantity to that to which specific taxes are applied (or vice versa), specific taxes present no particular problem. However, where taxes are of the ad valorem variety, calculation of the amount of tax collected requires both the tax rate (some percentage) and the item's price either immediately before or immediately after the application of the tax.

**38.** If an ad valorem tax is applied at the retail level then the amount of tax collected can be calculated from the tax rate and the observed final transaction price (including tax). If an ad valorem tax is applied at some other point in the distribution chain (e.g. on the wholesale price), then additional price information (or information on margins) is required.

Which Option is Best?

*continued*

**39.** A constant tax rate index overcomes this problem by taking a 'multiplicative' rather than 'additive' view of final market prices. That is  $p = b \times m^1 \times t^1 \dots \times m^n \times t^n$  where margins and taxes at each step in the chain are expressed in 'mark-up' form (i.e. a tax of 10% = 1.1)<sup>3</sup>. Conversion from tax rates of one period to those of another is accomplished by dividing by the tax rate of the comparison period and multiplying by the rates of the reference (or base) period and there is no need to know margins. The validity of this model can be challenged on a number of grounds - particularly in the longer term. In the case of a move from ad valorem taxes levied on the wholesale price to ad valorem taxes levied on the retail price, this measure would tend to understate the significance of tax change as it would regard a 10% WST as being equivalent to a 10% GST when, other things being equal, the latter would raise a greater dollar amount. However, it represents the only feasible option and at an aggregate level is unlikely to deliver significantly misleading results in the medium term (e.g. across periods of around a year).

Conclusion

**40.** The ABS is very conscious that we are unable to measure what CPI users and analysts really want - a measure of the full impact (covering first and subsequent round effects) of TNTS on consumer prices. All that can be measured, based on observable final prices and published tax rates, is an approximation of the first round effect. As such *whatever we might do can only provide an upper limit* of the impact of TNTS on the CPI, based on the generally accepted view that the second and subsequent round effects will have a downwards impact on final consumer prices.

**41.** Even with the limitation set out in the previous paragraph, it will be impossible in 2000–2001 to calculate the conceptually preferred constant fiscal take measure because ABS does not have information on either the before or after prices applying at the stage in the production and distribution chain where the current ad valorem WST is applied. The best that we are therefore able to do is compile a constant tax rate measure.

**42.** The ABS has some significant reservations about the constant tax rate measure, but CPI users and analysts have been almost universally supportive of the ABS 'doing something'. It has therefore been decided that an experimental constant tax rate measure will be compiled and published in *Australian Economic Indicators* (Cat. no. 1350.0) approximately one month after publication of the CPI for September quarter 2000, together with the qualifications that will attach to such a measure. Users will be strongly advised to treat the measure with appropriate caution.

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<sup>3</sup> The simplified example cited here covers only ad valorem taxes; specific taxes are treated as an additive term.

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