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LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
ARPI	Award Rates of Pay Indexes
AWE	Average Weekly Earnings survey
EA	Elementary aggregate
LCI	Labour Cost Index
WCI	Wage Cost Index
. .	not applicable

INTRODUCTION

1 This Information Paper is being released in conjunction with the publication by the ABS of the first quarterly movements of a new statistical series, the Wage Cost Index (WCI). The December quarter 1997 issue of the publication *Wage Cost Index, Australia* (Cat. no. 6345.0) was released on 26 March 1998.

2 The paper describes the range of indexes produced, the reasons for developing the WCI, the intended uses of the indexes, and the methods used for data collection and index compilation. It also outlines the conceptual framework of the WCI, and ABS plans for further work in the area of labour cost indexes.

COMPONENT INDEXES OF THE WCI

3 The WCI is an integrated set of quarterly indexes measuring changes in wage and salary costs for employee jobs, unaffected by changes in the quality and quantity of work performed. Index numbers are compiled from hourly wage and salary costs for a representative sample of employee jobs within a sample of employing organisations. Individual indexes are compiled for various combinations of State/Territory, sector (private/public), broad industry group and broad occupation group.

4 There are four sets of quarterly Laspeyres (i.e. base-period weighted) indexes published in *Wage Cost Index, Australia* (6345.0):

- Ordinary time hourly rates of pay — excluding bonuses;
- Ordinary time hourly rates of pay — including bonuses;
- Total hourly rates of pay — excluding bonuses; and
- Total hourly rates of pay — including bonuses.

The four component sets of indexes together comprise the WCI.

5 The *ordinary time* indexes that exclude bonuses measure quarterly changes in ordinary time hourly wage and salary rates. These indexes are not affected by changes in penalty payments (which fluctuate depending on the number of hours paid at penalty rates) and allowances (which fluctuate according to how much work is performed under special work conditions e.g. height, dirt, heat allowances). Specifically, the following effects are excluded:

- changes in penalty rates for overtime, shifts, weekends and public holidays;
- changes in the amount of work undertaken at penalty rates (e.g. less night shift, or more overtime);
- changes in allowances paid; and
- rolling of penalty payments (other than overtime) and allowances into the ordinary time hourly rate.

COMPONENT INDEXES OF THE WCI *continued*

6 The *total hourly* indexes that exclude bonuses combine ordinary time and overtime hourly rates. They are similar to the ordinary time indexes, but include the effect of any changes in overtime penalty rates. Effects of changes in the *amount* of overtime are excluded. When overtime penalty payments are rolled into ordinary time hourly rates, the effect on the total hourly indexes will be minimal, since the increase in the ordinary time hourly rate will tend to be offset by the elimination of overtime penalty payments.

7 The indexes that *include bonuses* will tend to be more volatile than those that exclude bonuses, owing to quarterly changes in performance-based payments that are a feature of many collective and individual wage agreements. Bonus payments are converted to an hourly rate based on the relevant period of work. This hourly rate is then added to the respective hourly wage and salary rates (ordinary time and total) to give hourly rates *including bonuses*. These hourly rates are used to compile the indexes that include bonuses.

8 For all indexes, both the cash and non-cash components of flexible salary packages are included in the wage and salary cost. If only the cash component were collected as salary, then spurious movements would occur in wage and salary rates. This is because the proportion of a salary package taken in cash can vary over time even though there has been no change in cost to the employer.

9 There are no separate male and female indexes available from the WCI. The WCI is based on employee *jobs*, and since gender is not an attribute of a job, it is not possible to define male and female indexes within the conceptual framework of the WCI.

10 There are also no separate indexes for overtime alone, because there are too few jobs with overtime payments to enable reliable overtime indexes to be constructed.

REASONS FOR DEVELOPING THE WCI

11 Until the early 1990s, the wages and conditions of most Australian employees were regulated by the award system. Industrial awards prescribe employment conditions and rates of pay for occupational structures within industries, trades and, in some instances, individual large organisations. An employer is bound by law to pay at least the rates prescribed in an award (i.e. the award rates) to all its employees covered by the award. The award system is administered by federal and State industrial commissions and courts.

12 In more recent years, the method of wage determination has moved away from the award-based centralised wage fixing environment in favour of agreements at the enterprise, workplace and individual employee levels. Although these agreements are often underpinned by awards, the role of awards has been reduced principally to the status of a 'safety net' of minimum wages and conditions.

13 The decentralisation of wage fixing rendered the ABS's Award Rates of Pay Indexes (ARPI) inappropriate for measuring changes in wage rates. These indexes were designed to measure movements in award wage rates for those employees covered by awards. The ARPI were last

REASONS FOR DEVELOPING THE WCI
continued

rebased in 1985, at a time when approximately 90 per cent of employees had their remuneration determined by award rates. Since awards do not generally reflect wage outcomes from enterprise, workplace and individual agreements, the ARPI effectively ceased being useful measures of change in the 'price' of labour. The ABS ceased publishing ARPI after the release of the June 1997 issue of *Award Rates of Pay Indexes, Australia* (Cat. no. 6312.0).

14 The ABS's Average Weekly Earnings (AWE) survey currently provides quarterly measures of average weekly earnings of employees, based on information collected from a random sample of employing organisations. These are published in *Average Weekly Earnings, Australia* (Cat. no. 6301.0), which contains preliminary results each quarter, and *Average Weekly Earnings, States and Australia* (Cat. no. 6302.0), which contains the final results. The average weekly earnings estimates are computed by dividing estimates of total gross weekly earnings by estimates of the number of employees. The AWE survey was designed to provide reliable estimates of average weekly earnings of employees and the quarterly change in that average. Average weekly earnings estimates from the AWE survey are affected by compositional shifts in the employee workforce, by changes in average hours paid per employee, and by changes in the AWE survey sample selected each quarter from the ABS business register. The AWE survey can also give a distorted picture of movements in ordinary time earnings when, for example, overtime penalty payments or benefits such as leave loading are rolled into ordinary wages and salaries as part of an enterprise or workplace agreement. None of these effects should be present in the WCI, as it is intended to measure changes in the underlying price of labour.

15 The lack of a reliable indicator for the analysis of trends in the price of labour was identified as a significant statistical gap by a number of major users of ABS earnings data. The WCI is intended to fill a large part of that gap.

USES OF THE WCI

16 The WCI is an important addition to the range of economic indicators published regularly by the ABS. It will have widespread application in the analysis of monetary, fiscal and wage policies. The various indexes will enable analysts and policy makers to assess the impact of wage cost changes at the State, sector (private/public), broad industry and broad occupation levels.

17 The WCI will also be used:

- for rise and fall clauses in contracts to adjust the wage component of contract costs in line with movements in the cost of labour;
- by employers and employee representatives in the wage and salary negotiation process; and
- in the compilation of volume measures in the Australian National Accounts, for the construction of deflators for some industries.

WHAT THE WCI MEASURES

18 The component indexes of the WCI are 'pure' price indexes, i.e. they aim to measure changes in the wage and salary cost of a representative 'basket' of jobs over time, unaffected by changes in the quality or quantity of work performed. This is referred to as 'pricing to constant quality'. By following a 'basket' of jobs over time, and by maintaining a fixed weighting pattern at the level of elementary aggregates (see paragraph 50), these indexes will be unaffected by, for example, shifts in the distribution of employees by occupation and industry, and between full-time and part-time jobs. Thus, unlike other ABS earnings measures such as the quarterly Average Weekly Earnings series, the WCI will not measure changes in average (per employee) wage payments.

19 Genuine changes in rates of pay (i.e. changes in wage and salary costs which are not due to changes in the quality or quantity of work performed) arise from a range of sources including award variations, enterprise and workplace agreements, centralised wage fixing, individual contracts, and informal agreements. In the case of enterprise and workplace agreements, pay increases are generally specified as percentage increases to existing annual salaries or hourly rates to apply from certain effective dates, e.g. at six-monthly or annual intervals over the life of the agreement. These increases will be reflected in all component indexes after the payment of the increases to the employees (which is not necessarily the date they came into effect). Agreements often provide for bonus payments, with the size of the bonuses depending on certain performance related outcomes. Changes in these payments will be reflected in the two sets of indexes that include bonuses (see paragraph 7).

Pricing to constant quality

20 To price to constant quality, procedures need to be devised to enable quality differences to be identified and their effects removed in the calculation of price changes. 'Quality' in the WCI relates only to the inherent productivity of employees, and this is dependent on a range of personal attributes including age, experience, qualifications, skill level, motivation and fitness. Hence when pricing to constant quality in the WCI, no adjustment will be made for productivity changes arising from factors such as capital investment, technological change, more efficient organisational arrangements, and entrepreneurial activities.

21 Every effort is made to price to constant quality in the WCI, in spite of the difficulties in defining the quality of job performance in a measurable sense. Characteristics of the jobs being priced (e.g. title, grade, location, tasks) are specified in detail, and a range of quality adjustment procedures have been put in place which are designed to prevent any significant long-term bias in the indexes. For example, pay changes due to age increments, change in qualification level, change in apprenticeship year, successful completion of training, and completion of probationary periods do not affect the indexes. Likewise, the effects of salary increments due to length of service and work performance of individual employees are removed from the indexes, provided there is no change in the underlying salary range. These types of pay changes are treated as proxies for measurable quality change, whereas a change in the salary range for a selected employee job is treated as a genuine price change, and is included in the indexes.

22 The extent to which the quality of labour services associated with a particular job can be fully specified varies considerably across industry and occupation groups. For some classes of jobs, the existence of detailed job classification structures (e.g. level, grade, increment) enables correspondingly narrow and homogeneous quality bands to be defined. When there is a change in classification, the associated change in pay can easily be removed from the indexes. On the other hand, where no formal job classification structures exist, quality can only be differentiated into broad bands, leading to less precise quality adjustment of pay changes. In all cases, when further quality differentiation is not possible, it is assumed that the *average* quality of labour services provided by the available pool of potential employees is not changing significantly over time.

WCI SURVEY METHODOLOGY

Scope and coverage

23 The target population of employers for the WCI is all employing organisations in Australia (private and public sectors) except:

- enterprises primarily engaged in agriculture, forestry or fishing;
- private households employing staff; and
- overseas embassies, consulates etc.

24 The first group above is excluded primarily because a very high proportion of agricultural enterprises have no employees. It would be disproportionately costly to survey a sufficient number of these enterprises to obtain a sample of jobs which was large enough to adequately represent this industry. In addition, the highly seasonal nature of activities in this industry would make it difficult to track jobs over time. The other groups cannot be included because they are out of scope of the ABS Business Register from which the WCI sample of employers is selected.

25 All *employee* jobs in the target population of employers are in scope of the WCI, with the exception of the following:

- Australian permanent defence force jobs;
- 'non-maintainable' jobs (i.e. jobs that are expected to be occupied for less than 6 months of a year); and
- jobs for which wages and salaries are not determined by the Australian labour market: e.g. working proprietors of small incorporated enterprises; most employees of Community Development Employment Programs; jobs where the remuneration is set in a foreign country.

26 As such, full-time and part-time, permanent and casual, and managerial and non-managerial jobs are in scope of the WCI. Costs incurred by employers for work undertaken by *self-employed* persons such as consultants and subcontractors are out of scope of the WCI, as they do not relate to employee jobs. Workers paid commission without a retainer are also excluded, as a large number of such workers operate in a similar fashion to self-employed persons.

Sample design

27 A two-stage sampling procedure was used to generate a sample of employee jobs for the WCI: (i) a random sample of employers; (ii) a random sample of employee jobs within selected employers.

28 Probability sampling was used in the selection of both employers and jobs to ensure that the sample of jobs used in the compilation of the indexes was representative of all jobs. The use of probability sampling will also enable measures of statistical reliability to be derived, once a number of quarters of data have been collected.

29 In the first stage of sampling, 3,500 private and public sector employers were selected from the ABS Business Register. These employers were selected by stratifying the target population of employers by State/Territory, sector (private/public), industry group and employer size and selecting a random sample from each stratum. All large employers were included in the sample. For a small number of large and complex organisations, a subsample of locations was selected to simplify reporting arrangements.

30 In the second stage of sampling, employers (or locations) selected in the first stage were asked to randomly select up to 10 employee jobs from their payrolls. A total of approximately 19,000 jobs were selected, for which wage cost data are being collected quarterly, beginning with the September quarter 1997.

31 For effective ongoing index construction, it is important that a high proportion of the initial sample of employers is retained in subsequent quarters, and that the same sampled jobs within those employers stay in the sample where possible. However, it is also necessary to maintain representativeness of the index over time, as well as to limit the length of time that small businesses in particular are included in the sample. For these reasons, the employer sample will be reselected annually (for the September quarter) in a way that ensures a high proportion of continuing selections, while allowing new employers to be represented in the index sample.

32 When the sample is reselected each September quarter, the employers going out of the sample will still provide data for the September quarter to ensure the maximum number of jobs contribute to the index for that quarter. Employers selected to replace those going out will be "initialised" in the September quarter and contribute to the index for the first time in the December quarter.

33 Between annual reselections of the employer sample, a small number of employee jobs will be lost from the index sample because of the closure of some (mainly small) organisations. In addition, some jobs in continuing organisations will be replaced in the sample because of restructuring and other job changes.

Data collection

34 Information for the WCI is collected each quarter by mail questionnaires from employers included in the sample. In the first quarter that they participate in the survey, employers provide information for the sample of jobs they have selected, including job descriptions and wage and salary payments. In subsequent quarters they are asked to provide updated wage and salary information about the same jobs, using tailored forms containing the preprinted job descriptions previously provided. It is essential that the same *jobs* are compared in successive quarters, whether the individual employees occupying the designated jobs are the same or not.

35 For a variety of reasons, the tracking of jobs over time can be difficult. Jobs may cease to exist, or be substantially redefined, because of such things as restructuring of organisations or awards, downturns in the economy, or changes in the type of work undertaken by an organisation. Labour turnover and availability can also cause difficulties in tracking jobs.

Jobs contributing to the indexes

36 The job descriptions obtained initially from employers for each job include the main tasks (including specialisations if applicable), grade (e.g. award classification, increment), location, and other attributes which enable the employer to uniquely identify the job in future quarters. When the job descriptions are unchanged between adjacent quarters, then the job will 'match' and will contribute to the indexes.

37 In subsequent quarters, if there is a change in a job description, the job is either not matched (and another job is selected from the organisation with an identical job description to the job initially selected), or the associated non-genuine pay change is removed from the index calculations. When the non-genuine pay change has been removed, the job will match, and will contribute to the indexes.

38 There are other instances when non-genuine pay changes are removed from the indexes, even though the job descriptions match. The main ones are:

- the employee in the job changes location, and different rates of pay apply for the different locations;
- there is a new employee in a job who is paid at a higher level under 'salary maintenance';
- ordinary time penalty rates and allowances are rolled into base ordinary pay;
- bonuses (including leave loading) are rolled into base ordinary pay;
- there is a new employee in the job, and this employee is covered by a different remuneration arrangement;
- the employee in a job changes salary sacrifice arrangements;
- the employee in a job is on paid leave, and reduced payments for paid leave apply;
- there is a change in the quantity of tasks undertaken for a job.

INDEX CONSTRUCTION

Calculating hourly rates

39 Wage and salary payments to employees are computed on an hourly basis, whether or not this is the actual basis of payment. This obviates the need for any adjustment to be made to earnings data collected, which would be required if (for example) the WCI was based on weekly costs, and weekly paid hours were to change.

Ordinary time hourly rate

40 Each quarter, ordinary time earnings, its components, and ordinary time paid hours are collected for each sampled job for the reference pay period. Ordinary time penalty payments and allowances are excluded from total ordinary time gross earnings to produce a 'base' ordinary time earnings. This base ordinary time earnings figure is then divided by the number of ordinary time paid hours to produce an ordinary time hourly rate.

41 For salaried workers who are paid to perform a job regardless of the number of hours worked, the reported salary is converted to an equivalent hourly basis using information on usual weekly hours provided by the employer.

42 When jobs are paid by piece rates, an hourly rate is estimated in the first quarter after consultation with the employer. In subsequent quarters, the percentage change in the piece rate is collected and applied to the previous quarter's hourly rate.

Overtime hourly rate

43 A slightly different method is used to calculate an overtime hourly rate. The first time a job is surveyed in the WCI, overtime earnings, its components, and overtime paid hours are collected. An overtime 'base' earnings figure is then calculated by excluding overtime allowances. This is then divided by the number of overtime paid hours to create an overtime hourly rate.

44 In subsequent quarters, if there has been no change to overtime provisions for a job, an overtime hourly rate is calculated by pricing the same quantity of overtime at the same penalty rates as in the previous quarter. Overtime provisions specify the overtime penalty rates that apply to particular periods of overtime. For example, 1.5 times the ordinary rate might be paid for the first three hours of overtime worked Monday to Friday, and 2.0 times the ordinary rate for hours in excess of three hours. When overtime provisions change, the same overtime hours are re-priced using the new provisions. Overtime provisions may be altered when pay is reviewed for a job, for example when new individual contracts or collective agreements are struck.

45 Because overtime penalty rates are generally some multiple of the ordinary time rate, and because overtime provisions change rarely, the overtime hourly rate will tend to reflect the same movements as the ordinary time hourly rate.

Total hourly rate

46 The total hourly rate for a job is a weighted sum of its ordinary time and overtime hourly rates. The weights are based on standard weekly ordinary time hours and usual or average weekly overtime hours, respectively. This ensures that total hourly rates of pay indexes are not affected by quarterly fluctuations in the quantities of ordinary time and overtime hours paid for a job.

Hourly rates including bonuses

47 A number of the indexes compiled include bonuses. Bonuses are payments made to employees that are additional to regular wages or salary. They may relate to the employee's or organisation's performance, and may be paid on a regular basis i.e. weekly, fortnightly, monthly, quarterly, six monthly or annually, or on a one-off basis (e.g. staff suggestion bonuses).

48 Bonus payments are converted to an hourly rate based on the relevant period of work. For bonuses paid less frequently than quarterly, e.g. annual bonuses, the hourly rate is carried forward to subsequent quarters until the next such payment is due. One-off bonuses are treated as annual payments unless a specific time period is applicable, such as a bonus paid at the conclusion of a project. In this case the bonus is linked to the length of the project.

49 The hourly rate calculated for bonuses is then added to the respective hourly wage and salary rates (ordinary time and total hours) to give the total hourly rates. These total hourly rates are used to compile the indexes that include bonuses.

Elementary aggregate indexes

50 Elementary aggregates (EAs) are the finest aggregations of jobs in terms of State, sector (private/public), industry and occupation for which base period expenditure weights are available (see paragraphs 54 to 56). An EA index estimates the change in average hourly cost between the base quarter and the current quarter for the EA. It is formed by multiplying together successive quarter-to-quarter ratios of average hourly cost to give an overall ratio (current/base) of average hourly cost. Each quarter-to-quarter cost ratio is based on sampled jobs common to the two (adjacent) quarters.

51 For an EA, the quarter-to-quarter average hourly cost ratio is calculated as follows:

- multiply each job's hourly rate by its usual weekly hours and its sampling weight to get an estimate of the weekly cost for the population represented by that job (for both current and previous quarter);
- sum the weighted weekly costs over all jobs in the EA to get an estimate of the total weekly cost for the population represented by the EA (for both current and previous quarter);
- similarly, estimate the total weekly hours for the EA population by summing the product of usual weekly hours and sampling weight over all jobs in the EA;
- calculate the average hourly cost for the EA by dividing its total weekly cost by its total weekly hours (for both current and previous quarter);
- divide the current quarter's average hourly cost by the previous quarter's average hourly cost to get the quarter-to-quarter average hourly cost ratio.

52 The average hourly cost ratio (current/previous) above compares the current quarter's estimated average hourly wage cost for an EA with the previous quarter. The *cumulative* ratio of average hourly cost for an EA from the base quarter to the current quarter (i.e. the EA index) is computed by multiplying the current quarter's cost ratio (current/previous) by the previous quarter's cumulative cost ratio.

Publication indexes

53 Each publication index (e.g. total Australia, or New South Wales private sector) represents the amalgamation of a number of component EAs. For example, a total Australia index has in excess of 250 EAs, each corresponding to a particular combination of State/Territory, sector, industry and occupation. Each publication index estimates the percentage change in average hourly cost between the base quarter and the current quarter for the index population. It is a weighted average of its component EA indexes, with the weight for each EA being its share of base period wage and salary expenditure within the index population. In practice, a publication index is computed by (i) revaluing the EA base period expenditures to the current quarter using the EA indexes; (ii) summing the revalued EA expenditures to the required level of aggregation; (iii) forming the ratio of the total revalued expenditure to the total base period expenditure, and expressing this as a percentage.

See *Appendix 1* for a numerical example of how an index is compiled.

Base period expenditure weights

54 The EA base period expenditure weights, which are used to combine EA indexes into publication indexes, are derived from independent estimates of total weekly wages and salaries relating to the base quarter (September 1997). *Appendix 2* shows the distribution of base period expenditure for sector by State/Territory, sector by broad occupation, and sector by broad industry.

55 The EA base period expenditures were derived as the product of EA average weekly earnings estimates and EA employee counts. The average weekly earnings estimates were derived from employment and earnings data at the State by sector by industry level from the September quarter 1997 Survey of Employment and Earnings (SEE), and employment and earnings data at the sector by industry by occupation level from the May 1996 Employee Earnings and Hours (EEH) survey. Employee counts came from the August 1996 Census of Population and Housing (CPH). In deriving the EA base period expenditure weights, the following assumptions were made:

- the distribution of employees across State/Territory, sector, industry and occupation group did not change significantly between August 1996 (the reference period for the CPH) and August 1997 (the reference period for the base quarter of the WCI);
- average earnings relativities across occupation groups within sector by industry were the same for all States and Territories; and
- these relativities did not change significantly between May 1996 (the reference period for the EEH survey) and August 1997.

56 The WCI will be reweighted approximately every 5 years to take account of changing wage and salary expenditure patterns among the elementary aggregates. These changes result from changes in the distribution of the number of employee jobs among occupation groups, industries, States and sectors, as well as changes in wage rate relativities. The timing of the reweighting will be linked to the availability of output from the Census of Population and Housing conducted every 5 years.

CHANGES IN INDEX NUMBERS

57 Movements in index numbers from one quarter to another can be expressed either as percentage changes in index numbers or as changes in index points. When the comparison is with the base quarter (September 1997), the percentage change gives the same value as the change in index points. However, when the comparison is with a quarter other than the base quarter, then the two methods yield different results.

58 Generally, most users will make comparisons without reference to the base quarter. For example, they may want to compare the current quarter with the previous quarter or with the same quarter of the previous year. Such comparisons are usually expressed as percentage changes rather than as changes in index points. The example in *Appendix 1* illustrates this difference.

UNPUBLISHED INDEXES

59 The ABS also compiles indexes at different levels of aggregation than those published. For example, indexes are compiled at State/Territory levels for broad industry and occupation groupings. These other indexes may be made available on request. Generally a charge is made for providing unpublished statistics. Inquiries should be made to Andrew Harvey on Perth (08) 9360 5170 or Information Services in the nearest ABS office.

60 A subscription to future issues of the quarterly publication *Wage Cost Index, Australia* (Cat. no. 6345.0) can be obtained by calling 1300 366 323.

FUTURE PLANS

Enhancements to the WCI

61 The ABS is currently investigating whether it is feasible to construct sub-indexes of the WCI relating to individual sources of pay changes. For example, it might be possible to compile separate indexes for pay changes arising from Award variations or from enterprise and workplace agreements. These indexes, if feasible, will provide information on the impact of such things as safety net adjustments.

Labour Cost Index

62 Although changes in labour costs are primarily determined by wage rate movements, both wage and non-wage costs need to be considered when assessing changes in total labour costs.

63 The WCI is the first stage in the development of the Labour Cost Index (LCI). The LCI will measure the combined effect of changes in wage costs and selected non-wage labour costs. The range of labour costs to be included in the LCI coincides with the National Accounts measure of 'compensation of employees', together with the costs of fringe benefits tax and payroll tax. As described in the 1993 System of National Accounts, compensation of employees comprises: (i) wages and salaries in cash (for time worked as well as for paid leave); (ii) wages and salaries in kind (i.e. fringe benefits); and (iii) the value of social contributions payable by employers (e.g. for sickness, accident, redundancy, retirement). Thus the LCI will build on the wage component, incorporating costs relating to employer funded superannuation, workers' compensation, payroll tax, fringe benefits tax and paid leave.

64 Research into the availability of non-wage labour cost data has begun. This will be followed by the development of collection strategies for the non-wage costs, and methods for the compilation of the extended range of indexes. The non-wage components of the LCI will be introduced progressively.

APPENDIX 1

EXAMPLE OF INDEX COMPILATION

The example below, using artificial data, illustrates the WCI index compilation method for an index comprising two EAs. In the example, the current quarter is assumed to be March quarter 1998. The method is described more comprehensively in paragraphs 39 to 55.

(i) Estimate the total weekly cost for each EA population, for the current and previous quarters. This involves firstly multiplying the hourly rate for each job by its usual weekly hours and its sampling weight to get a weekly cost for the population represented by the job, and then summing the weekly costs over all jobs in the EA.

		Hourly rate ($)		*Usual weekly hours*	*Sampling weight*	*Weighted weekly cost ($)*	
		Dec 97	*Mar 98*		*Mar 98*	*Dec 97*	*Mar 98*
Elementary Aggregate (EA)		*(1)*	*(2)*	*(3)*	*(4)*	*(5)=(1)x(3)x(4)*	*(6)=(2)x(3)x(4)*
EA 1	Job 1	12.13	13.00	38	82	37 797.08	40 508.00
	Job 2	14.11	15.23	38	52	27 881.36	30 094.48
Total						65 678.44	70 602.48
EA 2	Job 3	18.00	19.80	35	60	37 800.00	41 580.00
	Job 4	12.00	12.00	25	20	6 000.00	6 000.00
	Job 5	13.80	14.50	40	60	33 120.00	34 800.00
Total						76 920.00	82 380.00

(ii) Derive an average hourly cost for each EA, for the current and previous quarters, by dividing each EA's total weekly cost by its total usual weekly hours. (Total usual weekly hours is estimated in a similar manner to the total weekly cost.)

	Total weekly cost ($)		*Total usual weekly hours*	*Average hourly cost ($)*	
	Dec 97	*Mar 98*		*Dec 97*	*Mar 98*
Elementary Aggregate (EA)	*(1)*	*(2)*	*(3)*	*(4)=(1)/(3)*	*(5)=(2)/(3)*
EA 1	65 678.44	70 602.48	5 092	12.898	13.865
EA 2	76 920.00	82 380.00	5 000	15.384	16.476

EXAMPLE OF INDEX COMPILATION *continued*

(iii) Calculate the latest quarterly ratio (current/previous) of average hourly cost for each EA.

	Average hourly cost ($)		*Quarterly ratio of average hourly cost (current/previous)*
	Dec 97	*Mar 98*	*Mar 98/Dec 97*
Elementary Aggregate (EA)	*(1)*	*(2)*	*(3)=(2)/(1)*
EA 1	12.898	13.865	1.075
EA 2	15.384	16.476	1.071

(iv) Calculate the cumulative ratio (current/base) of average hourly cost for each EA by multiplying the current quarterly cost ratio by the previous quarter's cumulative cost ratio.

	Cumulative cost ratio		*Quarterly cost ratio*	*Cumulative cost ratio*
	Sept 97 (base quarter)	*Dec 97/ Sept 97*	*Mar 98/ Dec 97*	*Mar 98/ Sept 97*
Elementary Aggregate (EA)		*(1)*	*(2)*	*(3)=(1)x(2)*
EA 1	1.000	1.020	1.075	1.097
EA 2	1.000	1.045	1.071	1.119

(v) For each EA, revalue the base period expenditure (see paragraphs 54 and 55) by the current quarter's cumulative cost ratio to give the current quarter's estimated expenditure. Sum the estimated expenditures over all EAs.

	Base period expenditure ($)	*Cumulative cost ratio*		*Estimated wage and salary expenditure ($)*	
		Dec 97	*Mar 98*	*Dec 97*	*Mar 98*
Elementary Aggregate (EA)	*(1)*	*(2)*	*(3)*	*(4)=(1)x(2)*	*(5)=(1)x(3)*
EA 1	62 000.00	1.020	1.097	63 240.00	68 014.00
EA 2	73 000.00	1.045	1.119	76 285.00	81 687.00
Total	135 000.00			139 525.00	149 701.00

EXAMPLE OF INDEX COMPILATION *continued*

(vi) Calculate the current quarter's index number by dividing the current quarter's total estimated wage and salary expenditure by the base period expenditure, and expressing as a percentage.

$$\text{Index number for Dec 97} = \frac{139\ 525.00}{135\ 000.00} \times 100.0 = 103.4$$

$$\text{Index number for Mar 98} = \frac{149\ 701.00}{135\ 000.00} \times 100.0 = 110.9$$

Index numbers are rounded to one decimal place before they are published.

Changes in index numbers

Changes in index numbers between quarters can be expressed either as changes in 'index points' or as 'percentage changes'. The following example illustrates these methods of expressing change between any two quarters.

Dec 97	103.4
Mar 98	110.9
Change in index points	7.5
Percentage change	$\frac{7.5}{103.4} \times 100 = 7.3\%$

APPENDIX 2

DISTRIBUTION OF BASE PERIOD EXPENDITURE

Elementary aggregate (EA) base period expenditures are used to weight EA indexes when they are combined into publication indexes. The base period expenditures are independent estimates of total weekly wages and salaries relating to the base quarter (September 1997). The following tables show the distribution of base period expenditure for sector by State/Territory; sector by broad occupation group; and sector by broad industry group.

1 SECTOR BY STATE/TERRITORY

	Private	*Public*	*Private and Public*
State/Territory	*%*	*%*	*%*
New South Wales	36.7	33.6	36.0
Victoria	26.9	20.1	25.2
Queensland	16.5	19.0	17.1
South Australia	6.7	7.9	7.0
Western Australia	9.4	8.9	9.3
Tasmania	1.8	2.7	2.0
Northern Territory	0.9	1.7	1.1
Australian Capital Territory	1.1	6.1	2.3
Australia	**100.0**	**100.0**	**100.0**

2 SECTOR BY BROAD OCCUPATION

	Private	*Public*	*Private and Public*
Occupation(a)	*%*	*%*	*%*
Managers and administrators	13.9	11.0	13.2
Professionals	18.0	39.1	23.1
Associate professionals	12.3	15.4	13.0
Tradespersons and related workers	15.3	6.9	13.3
Advanced clerical and service workers	4.4	2.0	3.8
Intermediate clerical, sales and service workers	13.3	14.0	13.5
Intermediate production and transport workers	10.8	4.0	9.2
Elementary clerical, sales and service workers	5.5	4.5	5.2
Labourers and related workers	6.5	3.1	5.7
All occupations	**100.0**	**100.0**	**100.0**

(a) Classified according to ASCO — *Australian Standard Classification of Occupations, Second Edition* (Cat. no. 1220.0)

3 SECTOR BY BROAD INDUSTRY

Industry(a)	*Private* %	*Public* %	*Private and Public* %
Mining	3.5	(b)	2.6
Manufacturing	21.1	(b)	16.0
Electricity, gas and water supply	0.7	(b)	1.3
Construction	8.0	(b)	6.3
Wholesale trade	9.0	(b)	6.9
Retail trade	11.9	(b)	9.0
Accommodation, cafes and restaurants	4.1	(b)	3.2
Transport and storage	5.9	(b)	5.8
Communication services	0.8	(b)	2.8
Finance and insurance	7.3	(b)	5.9
Property and business services	13.3	(b)	11.1
Government administration and defence	. .	26.1	6.3
Education	3.3	22.8	8.1
Health and community services	7.0	16.9	9.4
Cultural and recreational services	1.7	2.6	1.9
Personal and other services	2.4	6.0	3.4
All industries	**100.0**	**100.0**	**100.0**

(a) Classified according to the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*, 1993 (Cat. no. 1292.0).

(b) For the Public Sector these industries are combined and included in the 'All industries' total.

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