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The Labour Cost Index

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Abstract

This paper is a response to the requests of Canadian policy makers and researchers to develop a comprehensive index of total labour costs for the Canadian economy. This Labour Cost Index (LCI), which measures both wage and non-wage costs, would be free from the influence of employment shifts in industries and occupations.

This paper provides a review of the U.S. Employment Cost Index (ECI).

The paper describes the LCI in general terms and compares this measure of labour cost with some other Canadian labour market indicators. The paper lists some of the uses and limitations of labour cost index based on the experiences of some other countries with such an index.

The paper outlines the proposed plans and micro data model to be tested to develop a Canadian LCI. The major milestones and development issues are summarized in the paper.

Keywords: Labour Cost Index (LCI), Non-wage benefits, Workplace Employee Survey (WES), Basket of Jobs, Employment Cost Index (ECI).

Introduction

In recent years policy makers, analysts, academics and decision-makers in Canada have expressed the need for a reliable and comprehensive measure of the rate of change, in labour costs in this country. A measure of change in the total labour cost would provide both a better understanding of how specific labour markets adjust to changes in the demand and supply of labour and a timely measure of wage pressures. A Labour Cost Index (LCI) would be invaluable in understanding the role of variable pay and benefits in overall compensation whether such forms of compensation are increasing wage flexibility. Labour and management in this country could use the measure in determining any escalation clauses of their collective agreements. A reliable and comprehensive measure of the rate of change in labour costs in Canada would be a valuable addition to the body of statistics available on the economic well being of the nation.

Although information on the changes in the level of compensation paid to Canadian workers does exist the currently available compensation data all have various shortcomings. Labour Statistics Division of Statistics Canada produces a set of ***fixed-weighted average hourly and weekly earnings indexes*** that measure change in the paid hours and employment mix between industries, provinces/territories and salaried and hourly employees. However, these indexes are based on wages and salaries only and are affected by the change in occupational mix in employment.

With these limitations in mind, and requests from many users including Bank of Canada and Federal Department of Finance, a project to investigate the construction of a pilot Canadian Labour Cost Index (LCI) was launched. The ideal indicator would be a measure of the rate of change in the *total*[1] cost of one unit of labour per hour that is unaffected by shifts in either the occupational or industrial mix in employment.

The rest of the paper is organized as follows. Section I defines the Labour Cost Index. Section describes the experience of some other countries with measures of labour cost. Section III describes the construction and components of the Employment Cost Index (ECI) produced by the U.S. Bureau of Labour Statistics. Section IV compares the Labour Cost Index to some other traditional measures of labour cost. Section V outlines the proposed plans for producing an LCI in Canada. Section VI outlines the microdata modeling. Section VII outlines the implementation plan and some of the developmental issues of the LCI in Canada.

I. What is a Labour Cost Index?

A Labour Cost Index (LCI) is a relatively new concept,[2] measuring the rate of change in the total cost of one unit of labour, per hour. It is a measure of the change in the total cost of labour including wage and non-wage benefits for time worked and time not worked. Furthermore, the LCI is a measure of change in the total labour cost that controls for the same quality and quantity of work.

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1 Both wage and non-wage benefits costs.

2 First LCI numbers were published in 1980 (i.e., including both wage and salary and non-wage benefits components) in the U.S.A., in 1991 in New Zealand and in 1998 1st quarter in EU member states and one separate index for Eurostat. Australia is planning to produce full LCI by 2003 and Canada is planning to do the same by fall 2003. The ECI in the U.S. is very similar concept to LCI in Canada. In the paper the two terms have been used interchangeably.

The LCI is a Laspeyres' type or fixed-weighted index[3] like the consumer price index (CPI). It compares the rate of change in the average price of one unit of labour per hour at one point in time with a base year for a ***fixed basket of occupations*** over time. A fixed basket of occupations prevents shifts in the occupational composition of the workforce from appearing as wage gains or losses, as they do in some other measures of labour cost, e.g. variable weight average hourly earnings (AHE). The LCI is constructed to measure ***the average price of labour*** (both wage costs and non-wage benefit costs) for a given basket of occupations and ***not the change in the average level of labour compensation***, just as the CPI measures the rate of change in the average price of a specified basket of goods and services, rather than average cost of living changes. This gives the LCI its Laspeyres index heritage, where the weights are the share of selected occupations in the total occupations.

Some of the countries where LCI is already being produced are:[4]

- U.S.A.
- New Zealand
- Sweden
- Australia
- EUROSTAT (EU member countries)

The Labour Cost Index does not have a universal definition as does unit labour cost. Generally, the LCI measures the total cost of one unit of labour for one hour. Of the two components of labour cost, wages and salaries are similar in concept everywhere. It is the second component, non-wage benefits costs, that is dissimilar across countries depending on the needs and dynamics of the economy. In that sense, the LCI is not exactly the same measure across different countries as is a unit labour cost or labour productivity. Appendix A compares the components and survey methodology of LCI in some selected countries.

[3] A Laspeyres index is one that holds weights constant at the point of initial collection, and measures change based on those fixed weights. In calculating an index of changes in employer cost for compensation, a Laspeyers index involves the selection of a fixed set of occupations at initial collection. These occupations are held constant and the price of their compensation is measured.

[4] The details about the experience of these countries with LCI may be provided upon request.

Box 1: Different Terms, Similar Measures:

The U.S. ECI is similar to an LCI. The ECI measures the rate of change in the employee compensation, which includes wages, salaries and employers' cost for employee benefits. The ECI measures the hourly compensation of a fixed basket of jobs.

The LCI is a term more frequently used in Canada, Australia and New Zealand.

"Labour Price Index" is the term used by the member countries of the European union.

It should be noted that all of these three terms are essentially the same. The basic philosophy behind these measures of labour costs is to obtain a comprehensive index of total labour costs that, measures both wage and non-wage benefit costs, and is free from occupational and industrial shifts in employment.

II. The Experience of Other Countries with Measure of Labour Costs

An Employment Cost Index (ECI) was developed in the U.S.A. in response to policy makers' need for a timely, accurate, and comprehensive indicator of rates of changes in employers' labour costs that was free from the influence of employment shifts among industries and occupations. The first ECI data were published for September-December 1975 in June 1976 in the U.S.A. and were limited to private industry wage and salary (changes) by major occupational and industry groups, regions, union status and area size. In 1980, measures of total compensation cost changes (employers' cost of employee benefits in addition to wages and salaries) were developed as the rapid growth of employee benefits made it inappropriate to measure labour costs in terms of wages and salaries alone. In June 1981, state and local governments were added, bringing ECI coverage to ninety four percent of all civilian wages and salaries. In 1989 the U.S.A. replaced its Hourly Earnings Index with the ECI. In 1991, New Zealand replaced its Prevailing Weekly Wage Rates Index (PWWRI) by a Labour Cost Index. Australia plans to replace its Award System Index by the full LCI in 2003[5]. The Eurostat started to release their LCI number for its member countries in the 1st quarter of 1998.

Those countries that have constructed and published a Labour Cost Index have "customized" the measure in various degrees according to their own needs and means. As a result, each country's index tends to carry a unique set of uses and limitations. The experiences of New Zealand and the U.S.A. can be instructive as we attempt to build a Canadian Labour Cost Index, since only these two countries have been producing similar measures long enough to give a true sense of the long run uses and limitations of the data.

Uses of the ECI in the U.S.A.:

1. It is the only measure of labour costs that treats wages and salaries and total compensation consistently, and provides consistent sub-series by occupation and industry.

[5] They have publishing the Wage Cost Index (WCI) which does not take into account the non-wage benefits.

2. The ECI is used by the Federal Reserve Board to monitor the effects of monetary and fiscal policies and in formulating those policies.

3. It enables economists and analysts to assess the impact of labour cost changes in the economy both in the aggregates and by sectors.

4. The ECI is particularly important in studies of the relationship between prices, productivity, labour costs and employment.

5. The ECI is also used as an escalator of labour costs.

Uses of the LCI in New Zealand:

1. The Index is used in wage negotiations.

2. The index is used in contract escalation clauses (also referred to as cost fluctuation adjustment clauses). The salary and the wage rate indexes or the aggregate labour cost index for the appropriate industry (or occupation) group is used together with the corresponding Producers' Price Index (which measures movements in the price of non-labour production costs) to determine an appropriate cost fluctuation adjustment.

3. This allows both parties in a contract to have an agreed procedure for adjusting the originally tendered price, therefore compensating the party providing the goods and services for ongoing changes in labour and non-labour input costs.

4. Economic forecasters and policy makers use the index to monitor and forecast wage movements. The Reserve Bank of New Zealand uses the LCI, in conjunction with quarterly employment data, to monitor and forecast changes in unit labour costs and nominal wage inflation, which feed into monetary policy.

5. The index is used within Statistics New Zealand, such as National Accounts, and the Producers' Price Index.

The Limitations of the ECI in the U.S.A.:

1. Not all labour costs (e.g., training expenses, retroactive pay etc.) fall within the ECI definition of compensation.

2. The ECI in the U.S.A. does not cover certain types of compensation such as signing bonuses, and stock options.

3. The ECI has large sampling errors because the Bureau of Labour Statistics in the U.S. (BLS) collects information only from a small percentage of all relevant employees due to the cost involved.

4. The ECI is subject to overstatement of a Laspeyres type of index.

5. Currently in the U.S.A., the ECI does not cover all employers and all employees, although it does cover nearly all workers in the civilian (non-Federal) non-farm economy.

The Limitations of the LCI in New Zealand:

1. The index excludes irregular salary and wage payments such as irregular bonuses, commissions and one-off payments in lieu of wage increases.

2. The index excludes performance-based increases in salaries and wages, promotion and service increments.

3. There is no regional or gender breakdown of the LCI in New Zealand.

4. There is no information available on the average dollar value of wages. This is because the sample is not randomly selected, is relatively small and is designed to measure change rather than level.

III. The Components and Construction of the U.S. ECI

The U.S. ECI, is a quarterly series which measures labour compensation per hour worked, including all wages, salaries and non-wage benefits provided by the employers. It is considered to be the best source for the evaluation of overall employment-based price pressure. The ECI has achieved this success by capturing both wage and non-wage benefit cost movements. In the U.S.A, the Office of Management and Budget has designated the ECI as a principal Federal economic indicator.

The ECI is highly regarded as a measure of U.S. labour costs. Abate (1998) referred to the ECI as "the best measure of compensation costs." Similarly, a report by Griggs and Santow Incorporated described the ECI as "the best measure of wage behaviour and benefits being paid, and of the pace at which such employment costs are rising."

The index is computed from data on compensation by occupation collected from a sample of establishments and occupations weighted to represent the universe of establishments and occupations in the economy. The ECI has two components.

1. The wage and salary component of the index is represented by average straight-time hourly earnings in an occupation. Straight-time earnings are defined as total earnings before deductions, ***excluding*** premium payments for over-time, weekend, and late-shift work. Earnings include production bonuses, commissions, and cost of living allowances.

2. The non-wage component includes different types of vacation holidays, paid leave, employer contributions to pension plans, costs of insurance, non-production bonuses (which are considered a benefit in the ECI), payments in kind, room and board and tips. There are twenty different types of benefits that are currently included in the calculation of the ECI. BLS is presently conducting studies and surveys on stock options, which might become the twenty-first benefit to be included in the ECI calculations.

The basic ***unit of data collection*** is a job as defined by the establishment (statistical unit). The ECI measures wage (change) for the same jobs in the same establishments and applies fixed

employment weight controls for shifts in employment among jobs and establishments. The unit of observation is standardized to a certain extent below the job level by measuring different types of labour within the job; e.g., full or part time, incentive or time rated depending on the predominant type.

All earnings are computed on an hourly basis, whether or not that is the actual basis of payment. Earnings of salaried employees and those paid under incentive systems are converted to an hourly basis. Benefits cost data are also converted to an hourly basis. Thus, occupational hourly earnings plus the employer's cost per hour worked for employee benefits constitute the price of labour in the ECI.

The nature of data collected varies somewhat depending on the particular benefit. For paid leave benefits, the data element is usually expressed in terms of average number of days, weeks or hours per year. For insurance benefits, the data element may consist of thousand dollars of life insurance coverage or of a rate per month for medical insurance coverage. In the case of legally required benefits, a tax rate and taxable earnings ceiling are usually collected. However, whatever the form of data element, the benefit costs are always converted to cents per hour worked. Box 2 shows an example of the computation of cents-per-hour cost of benefits.

BOX 2: An example of cents-per-hour worked

- Data element — 2.8 average weeks of vacation
- Scheduled weekly hours — 40
- Straight-time average hourly rate — $6.95
- Annual hours worked (computed by data processing systems) — 1,950

$$\text{cents-per hour worked} = \left(\frac{\text{Weeks/year*hours/week*wage/hour}}{\text{hours/week}}\right)$$

$$\text{cents-per hour worked} = \left(\frac{2.8*40*\$6.95}{1{,}950}\right), \quad \text{cents-per-hour worked} = \$0.3999.$$

(2.8 weeks/year) * (40 hours/week) = 112 average annual hours of vacation
(112 hours/year) * ($6.95/hour) = $778.40 (average annual cost of vacation)
($778.49/year) / (1,950 hours/year) = $0.399 (average cost/hour worked for vacation)

At the U.S. Bureau of Labor Statistics (BLS), the ECI is calculated in two distinct steps. The first step of calculating the ECI is to estimate the mean compensation for each category of labour, which is more complicated than the calculations in the second stage. The simplest way to estimate the mean change in compensation for a category of labour between period 0 and period t would be to compare the average compensation for that category in the reference period and in the base period. Because the ECI sample changes over time, this would involve comparing averages across jobs that may not be homogeneous. To correct for this, the ECI takes a different approach. To start, the mean change in an estimating cell's compensation between period 0 and period 1 is estimated as the ratio of the average compensation for that category's jobs in period 1

to that in period 0. To ensure that the estimate is not affected by the sample changes, only those in the sample in both periods are used in the calculation. A similar procedure is then used to calculate the mean change in the compensation between periods 1 and 2, 2 and 3 and so on. The proportionate change in mean compensation from 0 to t can then be calculated as the product of the individual per-period changes.

The second step is to aggregate the cell averages to obtain a final index. The ECI is designed to indicate how the average compensation paid out by employers would have changed over time if the industrial-occupational composition of employment had not changed from the base period. It is calculated as the weighted sum of the changes in compensation costs for all of the industry-occupation job cells, where the weighting factor for each cell is its share of total labour compensation in the base period. The employment numbers used in the construction of weights are obtained from the Census of Population.

The ECI is calculated from the following data.

1. ***Average straight-time hourly earnings*** for those occupations for which data are available for both current and prior survey periods.

2. ***Non-wage-benefit costs per hour*** incurred by the employer.

3. ***Employment*** of occupations in an industry.

4. ***Sample weights*** derived from an occupational employment survey or the initial employment reported on the survey schedule. These weights reflect both employment in each establishment/occupation surveyed and the probability of selection of that establishment/ occupation.

In the U.S.A. the ECI is published quarterly in the month after the survey period. The data are published in *Current Wage Developments* and the *Monthly Labour Review*, monthly BLS periodicals. The ECI is not a quarterly index in the sense that it is not an average of the quarter. The index is calculated from the data of the third month of the quarter and is published every quarter.

Perhaps the best way to illustrate the calculation of the ECI is to examine the basic computational framework used in the U.S.A. to calculate their Employment Cost Index (or ECI), via an index number formula with fixed weights.[6] The simplified formula for the calculation is given in box 3.

[6] The American ECI calculation formula differs from this procedure. The formula presented here has been simplified for the illustration purposes.

Box 3: Formula to Calculate the ECI

$$ECI_t = \left(\sum_{i}^{L} \left[\frac{E_{i0} W_{i0}}{\sum_{i} E_{i0} W_{i0}} \frac{W_{it}}{W_{i0}} \right] * 100 \right)$$

Where,
ECI_t = Employment cost index in period t,
W_{it} = mean compensation paid to category i workers in period t
E_{it} = number of category i workers employed in period t
0 = base period
t = current period

Stock options are a non-wage benefit, which are becoming very popular. The BLS is conducting studies on this issue to determine if stock options should be included as the twenty-first benefit in the ECI calculation.

IV. A Comparison of the LCI with Some Other Measures of Labour Cost

The LCI differs from other measures of labour costs, Average Hourly Earnings (AHE), Unit Labour Cost (ULC) and Compensation per Hour (CPH). The following section compares ECI with these other measures of labour cost.

1. The LCI and The Average Hourly Earnings (AHE):

The Average Hourly Earnings series (AHE) is published by the Labour Statistics Division (LSD) of Statistics Canada and is derived from the Survey of Employment, Payroll and Hours (SEPH) and reflects changes in hourly earnings including overtime and other variable payments. The AHE is the ratio of total payroll of employees to their total paid hours. Being a monthly series, the average hourly earnings series is more timely (a monthly series) than the LCI (the LCI is a quarterly series in most countries)[7]. But the LCI is a more complete measure of labour costs because it will include many important elements of labour compensation such as non-production bonuses, health insurance and payroll taxes paid by the employers that are not present in average hourly earnings.

2. Fixed weighted Average Hourly/Weekly Earnings:

The Labour Statistics Division of Statistics Canada also produces a set of fixed-weighted average hourly and weekly earnings indexes designed to deal with the impact of changes in the paid hours and employment mix between industries, provinces/territories and salaried and hourly employees. The data series adjusts for compositional changes in employment by re-aggregating the Survey of Employment, Payroll and Hours (SEPH), because it is an important source of

[7] In Canada first published LCI numbers will be an annual series, but the plans are to eventually publish them as a quarterly series.

compositional change in certain industries. The base year for the current index is 1986 = 100. However, since SEPH does not collect data by occupation, the fixed weighted earnings indexes do not account for shifts in occupation that affect underlying trends in wage rates. It also does not collect information on non-wage benefits

3. The LCI and the Unit Labour Cost (ULC):

The Unit Labour Cost (ULC) is defined as labour compensation per hour divided by output per hour, where output per hour measures labour productivity. Similar to the LCI the ULC includes non-wage benefit costs, such as social security taxes and health insurance costs paid by employers.

But the ULC also includes some compensation, such as proprietors' income, that is not included in the LCI.

A potential disadvantage of the ULC is that the compensation per hour measure used to calculate the ULC does not apply fixed industry and occupation weights, as will LCI. An important advantage of the ULC over the LCI is the adjustment for changes in labour productivity.

Table compares the LCI with AHE and ULC. Appendix B compares the data sources, frequencies, coverage and shortcomings of different Statistics Canada labour surveys. .

Table A

A Comparison of Different Labour Costs

ITEMS	LCI (Proposed)	AHE	ULC
DEFINITIONS	LCI = (Total wage and non-wage benefits in period t / Total wage and non-wage benefits in period 0)*100	AHE = Total payroll of employees / Their total paid hours	ULC = Total out put per hour/ Labour compensation per hour
Employment coverage	All production and non-production workers excluding farming, forestry, fishing, hunting and trapping industries, public administration and self employed workers	Excludes farming, forestry, fishing, hunting and trapping industries, public administration and self employed workers	Self employed workers included
Compensation coverage	Wages and salaries PLUS employers' cost of employee benefits	Includes wages and salaries, commission, overtime payments, piecework payments and paid leaves	Like LCI, it includes both wage and non-wage benefits
Wage change	Measures changes in wages and salaries and employee benefits ***excluding*** the effects of employment shifts occupations and industries	AHE does not include non-wage benefits and also does not discount for shifts in occupational employment	Does not apply fixed industry occupation weights, therefore a shift in the employment mix towards higher paying jobs could be misinterpreted as labour cost inflation
Overtime payments	Eliminates fluctuations due to changes in the number of hours worked	Includes overtime payments	
Detailed series	LCI may publish publishes series for industrial, occupational and geographical classifications	AHE does not produce data for very detailed classifications.	ULC does not produce data for such detailed classifications.

V. Proposed LCI for Canada: A Workplace Employee Survey (WES) Integrated Approach

The annual Workplace and Employee Survey (WES) conducted by Statistics Canada has been designed to provide information on a broad range of issues relating to employers and employees. The survey is unique in that ***employers*** and ***employees***, who will be followed over several years will also be linked at micro data level: employees are randomly selected from within sampled business locations. Thus information from both the supply and demand side of the labour market will be available to enrich studies focussed on either side of the market.

The WES will be used to produce the major micro data components for the Labour Cost Index[8]. The quantitative data for payrolls and the non-wage benefit component costs will be extracted from the WES ***employer*** survey. The numeric data for the wage rate and variable pay components, and of non-wage benefits by occupation will be obtained form the WES ***employee*** survey.

The LCI development team originally planned to cost non-wage benefits by collecting incidence data from employers through the Workplace Employee Survey (WES) and pricing the benefits through a small survey of the benefit provider industry. It was felt that this approach would both minimize the response burden on WES respondents and provide a low-cost method. The development team met with representatives of the insurance industry (benefit providers) and a major benefits consulting firm. Information gathered at these meetings led the project team to reject the insurance industry survey as the first choice to cost non-wage benefit costs for the LCI.

The major drawback to the initial proposed approach was that insurance providers would need far more detail than we currently collect in the WES to effectively cost the benefits. For example, the WES simply collects information on the availability of supplemental medical plans. To cost these plans, insurers would need to know which benefits are covered, which are excluded, the level of co-insurance, whether benefits are extended to family members, the industry and some idea of the demographics of the employees. This level of detail would be required across the range of benefits. To collect this level of detail, would require two very burdensome surveys:

1) the WES with vastly expanded content covering the particulars of non-wage benefits for various groups of employees, and

2) a benefit providers survey that would require that respondents cost out a number of detailed plans so that the full range of packages covered by WES could be costly.

A secondary concern is a trend among large employers (e.g. the federal government) to self-insure at least some of their benefits, with insurance companies simply providing administrative services. Thus, for many large firms, we would have to either collect the cost information from the employer (which we were trying to avoid with this approach) or find out who provides their administrative services and get the costs from them. Neither option seemed to be in the spirit of the original proposal. Nor would the benefit provider option have ensured quality information, since annual outlays from these plans can vary significantly from their actuarial costs.

[8] See chart-A.

Consequently, the development team decided to test an approach based on collecting basic non-wage benefit cost information from employers. We decided to ask respondents to provide average cost per employee data since it is based on the recall knowledge of our primarily Human Resources respondents. For example, most would know pension costs and disability premiums as a percentage of salary, the dollar cost per employee of supplemental and dental premiums, and so on. While adding to the burden of WES, it would be less burdensome than collecting the detailed information required by insurers to cost the benefits externally.

This approach was field tested with a subset of WES employer questions in January and February 2000 on a small, non-overlapping (i.e. not WES respondents) sample of about 200 locations. Following an assessment of the process as well as respondents' and interviewers' perception of the response burden, we have decided that testing the WES-integrated approach is feasible.

The WES-integrated pilot test of about 1000 non-overlapping WES employers will be conducted in the fall of 2000. This test will also be used to assess the response burden of the WES-integrated approach in preparation for the YEAR 3 production survey collection planned to be in the field in the spring of 2001. Thus the LCI becomes a product of the WES. Appendix C lists the non-wage benefits to be included in the Canadian LCI.

VI. The Proposed Canadian LCI Micro Data Model

The Canadian LCI has two components:[9]

1. Wages and salaries
2. Non-wage benefits

The information on wage and non-wage benefits as well as demographic data such as gender, education level, tenure, and ethnicity will be collected from both the employer and employee portions of WES.

The statutory benefits are a direct function of wages and salaries, hours of work and province of residence and will be modeled from the WES employee survey.

The pay, health, pension and paid leave non-wage benefits will be based on an algorithm that will convert hourly contributions based on the employee categories. Some of the components of the model are:

- Job weights and wage/salary for t_0 from WES as well as incidence of benefits
- Wage movements from LFS $t_0, t_1, \ldots\ldots, t_n$
- Benefits price from Employee Benefit Survey
- Model of statutory benefits $t_0, t_1, \ldots\ldots, t_n$

[9] See chart-B.

The micro data components of the LCI are listed in table B.

Table B

The Labour Cost Index Micro data Components

Labour Cost Component	**Point Estimate Source**	**Price Movement Source**	**Linkage Level**	**Modeling**
Hourly Wages *including* overtime	WES Employees	Labour Force Survey	Occupational (some industry and regional components)	
Statutory Benefits **(EI, CPP/QPP)**	Modeled function of wages, program parameters and province	Remittance data Project forward using the changes in the statutory benefits in the modeling	Algorithms at the province level, pushed down to the employee level.	Payroll Tax Model Check rollups with PD7
Provincial Health Taxes		Moves according to statutory and regulatory changes, as well as wage movements.		Health Tax Model (Four provinces)
Other Non-wage Benefits				
Health, Pension, Payroll, and Leave Related	Actual data from WES Employer Survey: Avg. Worker cost/hour by benefit plan for full-time and part-time employees by management and non-management categories	Forward Projection Collected annually	WES EMPLOYER SURVEY	
Leave Related	Actual employee incidence information on leaves from WES Employee Survey	Forward Projection Collected annually	WES Employer Survey	

VII. LCI Implementation Plan and Development Issues in Canada

LCI Implementation Plan:

It was agreed at the inaugural LCI Steering Committee meeting on January 31, 2000 that efforts be focussed initially on releasing an annual rather than a quarterly index. The target date is fall 2003. The plan is to use the wage and non-wage benefit cost benchmarks from the Workplace and Employee Surveys to be conducted in the spring 2001 and 2002. Appendix D contains the developmental milestones for the LCI.

The average monthly non-wage benefit costs by employee category for each benefit from the ***employer*** portion of WES will be applied to the incidence data for non-wage benefits from the ***employee*** portion of WES. These derived non-wage benefit costs per employee will be added to the respective wage costs from the ***employee*** survey. These components will be weighted at occupational, industrial and geographical levels to produce a Labour Cost Index.

In keeping with the goal of producing a quarterly LCI, work will continue on development issues such as using the wages and salaries data from Labour Force Survey (LFS) as a projector for the WES – based LCI benchmark. In order to deal with the issue of the LFS projector will lagging real change in the costs of compensation during the year,[10] it was recommended that the wage question be asked in the first and fourth month of each 6-month rotation panel whether or not an employee changed jobs. Another issue that remains to be resolved relates to the level differences between the LFS-projected quarterly wage cost and the WES-based annual wage cost benchmark.

LCI Annual Development Issues

Measurement and changes in remuneration:

Knowledge about the structure of labour compensation has received more attention in recent years due to increased pressures of international competition and corporate restructuring. The growing importance of variable pay both in terms of the employer cost levels per hour worked and as a percentage of total labour compensation is integral to analyzing changes in labour market conditions. In order to comprehensively measure and quantify the impact of variable pay in the LCI, the YEAR 2 production employee survey will test the respondent's ability to report detailed earnings for each of the following types of variable pay: overtime payments[11]; shift differentials, tips, commissions and piecework payments; productivity-related bonuses, profit

[10] In the Labour Force Survey (LFS) the sampled households remain in the sample for six months. However, to reduce the response burden the question on earnings is asked only in the first month and is carried through for next five months unless there is a change in either employer or occupation.

[11] Since the LCI includes overtime payments as a fixed increment to wages, short-term increases in overtime do not alter the index. Bureau of Labour Statistics (BLS) collects overtime hours at the initiation stage. Then the same hours are carried forward to the next ECI survey unless the samples are replaced. Any change in overtime hours of the employee after the initiation stage is not considered. This is done for practical reasons. However the change in the overtime rate will alter the compensation for the fixed (at the initiation stage) overtime hours.

sharing or profit related bonuses; and other bonuses. Conceptually speaking, tips should be excluded from the LCI, but included for WES. Information from the employee portion for variable pay will be cross-referenced by the incidence data reported by employers. The measurement of variable pay in the LCI is key since it will be the variable pay and not the base pay that is expected to have the biggest influence in movements in the LCI.

The fact that certain forms of variable pay such as overtime earnings, productivity related bonuses, profit sharing and profit related bonuses are not collected by the LFS is a limitation in the LFS as a quarterly projector of the changes in the wages and salaries component of the LCI. The drawback is somewhat mitigated by adding "bonuses" to the LFS questions on tips and commissions, while overtime earnings in the LFS will be derived by applying the WES-based premium rates to the LFS overtime hours.

Homogeneity in the basket of jobs:

There are three central issues related to the stabilization of the homogeneity of the basket of jobs using the employee portion of WES.

1) Classification of the employee job

The job is self-reported using the same questions as the Labour Force Survey (LFS). There are problems of response error and coding error especially at the detailed level. Self-enumeration yields occupational error. The occupational error for WES is somewhat reduced given that employees are selected from employee lists supplied by the employers, there is little to no proxy reporting.

The WES auxiliary information from the employee survey on such factors as training, education and technology use can be used to build up a skill level in the WES job description.

2) How to maintain occupational overlapping in the employee sample

Since the employee sample is redrawn in odd years, consideration is being given to following employees in even years for one additional year and administering only the LCI questions from the ***employee*** survey. Thus, for YEAR 3, as an example, we would follow an additional 15,000 employees from YEAR 2 and replenish the employee sample with another 25,000 workers. This enriched employee sample would allow for an assessment of the impact on attrition with the extra continuing wave of employees from YEAR 2 and could be used to compare the homogeneity of the baskets between YEARs 1, 2 and 3.

The impact of the first fixed basket of jobs, which would be initiated in YEAR 3, on successive production YEARS would arise from employees with different attributes such as tenure. We could tease out tenure effects by focussing on aggregate levels. One approach would be to model LCI using regressions to estimate returns to tenure by industry using YEAR1 WES data. But there is a problem in the even years, when there is a bias since we have continuing employees—with increasing tenure – but no new employees to dampen the tenure effect.

3) How to monitor and assess the impact of Standard Occupational Classification attrition on the Labour Cost Index

Given the extra wave of continuing employees in each odd year, attrition analysis between YEARs would be enhanced with this supplementary sample of workers. Also, comparisons between the occupation mix generated by the redrawn sample in each odd year and the continuing wave of employees administered only the LCI questions will be carried out to assess the homogeneity of the basket.

Chart A

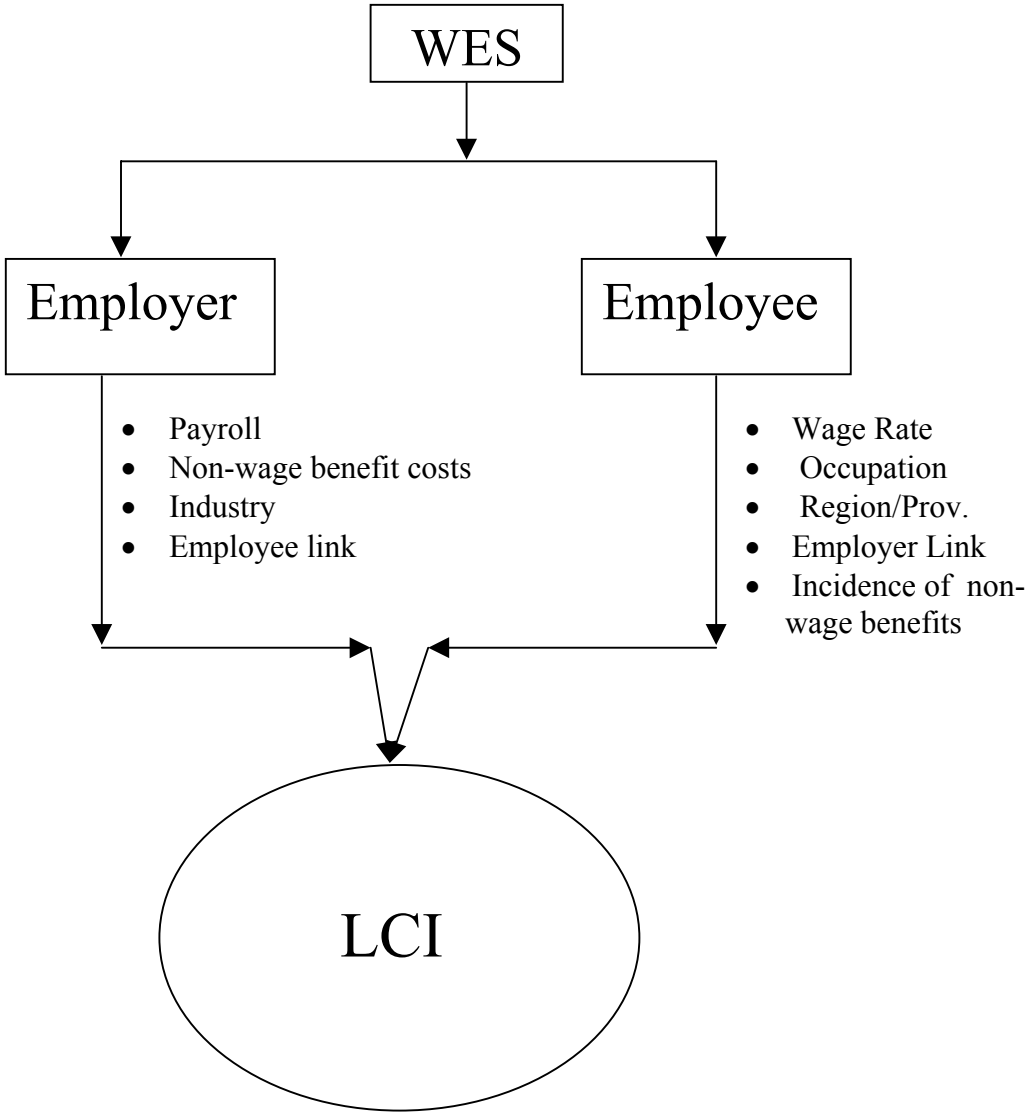
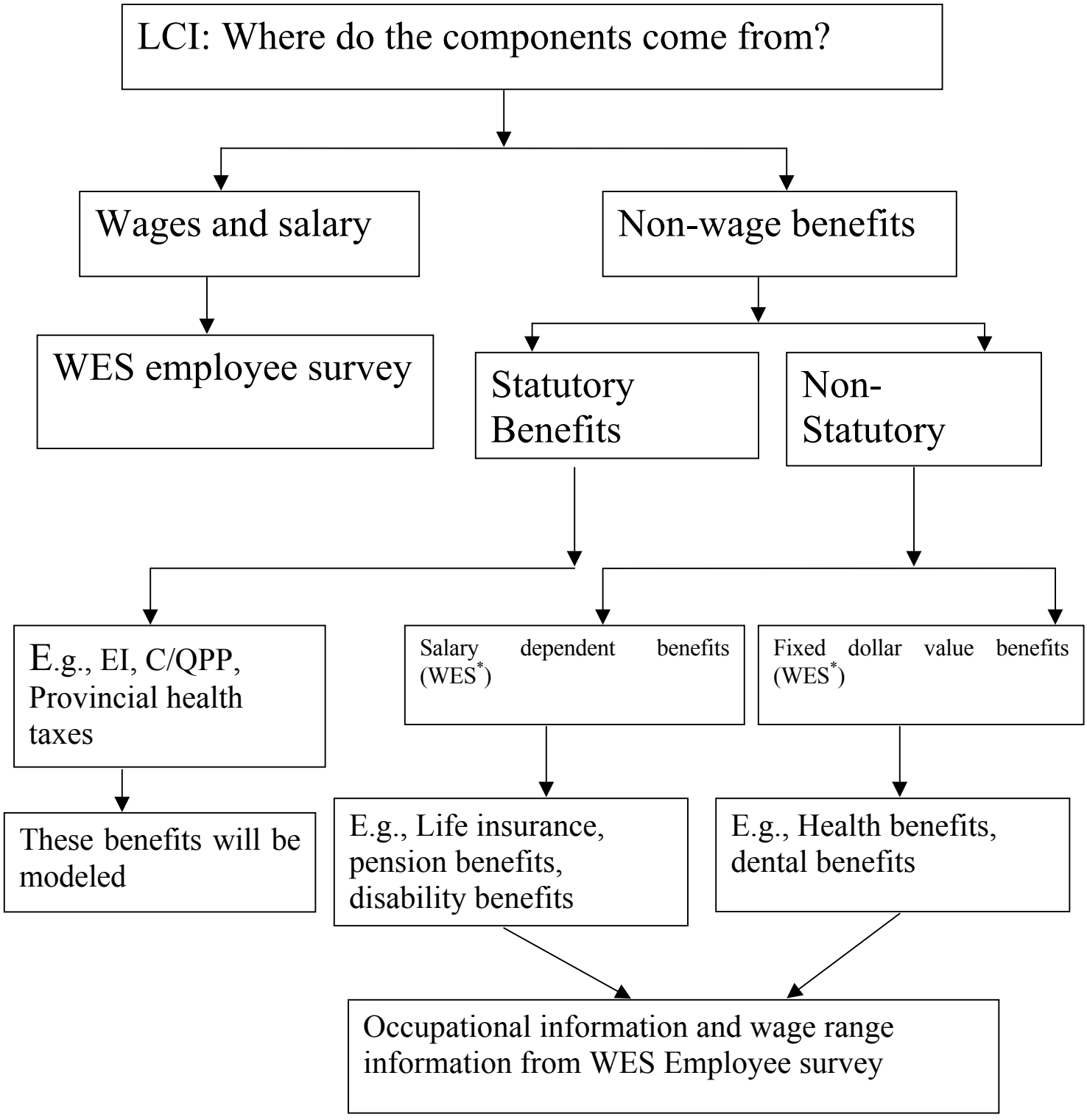

WES
Employer
Employee
Payroll
Non-wage benefit costs
Industry
Employee link
Wage Rate
Occupation
Region/Prov.
Employer Link
Incidence of non-wage benefits
LCI

Chart B



* Workplace Employee Survey (Employer Questionnaire)

Appendix A

LCI: Survey Methodology Tables

Items covered in LCI	The U.S.A.	New Zealand	Australia	Spain	Sweden	Canada (proposed)
Federal Government	No	Yes	Yes	Yes	Not Known	Only para-government services Public administration is excluded
State Government	Yes	Yes	Yes	Yes	Not Known	Only para-government services Public-administration is excluded
Local Government	Yes	Yes	Yes	Yes	Not Known	Only para-government services Public administration is excluded
All Industries	Yes	Yes	Yes	Yes	Not Known	Excludes public administration, agriculture, fishing, hunting and trapping, religious organizations, private households.
All occupations	Yes	Yes	Yes	Yes	Not Known	Yes
Sample size employees	4,900 (establishments)	2,600 employers	3,100 employers	Not Known	8,000 firms, 35,000 local units	Sample of employers (8,000 units),
Sample size employees	ZERO	ZERO	ZERO	ZERO	ZERO	approximately 35,000 employees from employer provided list
Full Time	All	All	All	All	All	All

Items covered in LCI	The U.S.A.	New Zealand	Australia	Spain	Sweden	Canada (proposed)
Part Time	All	Some	All	All	Some	All
Revision	No	**Yes**	No	Yes	Not Known	annual (with WES, weights will change biannually)
Sample Size (jobs)	17,500 occupations	5,100 job descriptions	19,000 job descriptions	Not Known	15% of population	**Not available**
Frequency of Index	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
Overtime	Yes	Yes	Yes	Yes	Yes	Yes
First LCI Published	1976	3Q1993	1998 WCI only, Full LCI in 2003	3Q1998	1998?	February 2002 (4th quarter 2001)
Replaced Existing Surveys	YES (Hourly Earnings Index in 1989)	YES (PWWRI in 1991)	YES (ARPI)	Not Known	Not Known	No
LCI by Gender	No	No	No	No	No	It is possible
LCI by Age	No	No	No	No	No	It is possible
LCI by Ethnicity	No	No	No	No	No	It is possible
LCI by Education Level	No	No	No	No	No	It is possible

Items covered in LCI	The U.S.A.	New Zealand	Australia	Spain	Sweden	Canada (proposed)
LCI by Tenure of Work	No	No	No	No	No	It is possible
LCI by Industry	Yes	No	No	No	No	It is possible
LCI by Occupation	Yes	Yes	Yes	Yes	Yes	It is possible
LCI by Geography	Yes	No	No	No	No	It is possible

Appendix B

Different Compensation Data Sources

GOVERNEMENT SOURCES				
SURVEY	**PUBLISHER**	**FREQUENCY**	**COVERAGE**	**SHORTCOMINGS**
Survey of Employment Payroll and Hours (SEPH) **(AHE)**	STC	Monthly since 1983	Use of Canada Customs and Revenue Agency ADMIN data, sample size 6,000 plan to increase to 10,000	• does not account for occupational shift in employment • no data by occupation or for non-wage benefits • measures employee and not jobs • still uses 1988 weights (too old)
Average Hourly Wages of employees from LFS (AHW)	STC	Monthly since January 1997	52,000 households across Canada	• No information about benefits, limited information about variable pay
Average compensation per Hour worked from IEAD (ACH)	STC	Quarterly	A compilation from different sources	• Affected by weight shifts • No detailed information
Survey of Labour Income Dynamics (SLID) **(LONGITUDINAL SURVEY)**	STC	Annual since 1993, overlapping six year panel	Initial sample drawn from LFS monthly survey	• High probability of recall error where hours and wages are not directly reported (55% of all cases) • Risk of attrition of original sample • Hourly wage rate for an individual not for a job category
WAGE SETTLEMENT DATA (WSD)	Workplace Information Directorate	Monthly	Units involving 500 or more employees across Canada (55% of unionized workforce and 20% of non-agriculture paid employment)	• Excludes non-unionized workers • Excludes bargaining units with fewer than 500 employees • Heavy weighting of public and goods sectors • No information about distribution of wages, benefits and variable pay
Work Place Employee Survey (WES) **(LONGITUDINAL SURVEY)**	BLMA and WES at STC	Annual , May 1998 (Pilot)	Sample of employers (8,000 units), employees to be selected from employer provided list of approximately 35,000 employees	• Measures employees and not jobs • Attrition strategy may reduce overlapping jobs between year 2 and 3 for continuing or surviving employees

Appendix C[12]

1. Pay Related Benefits:

    a) Severance allowances
    b) Supplementary allowances
    c) Other supplementary to employment insurance
    d) Other non wage benefits*

2. Health Related Benefits

    a) Dental care plan
    b) Life Insurance
    c) Supplementary medical Insurance**
    d) Workers' compensation premiums
    e) Short term disability
    f) Long term disability

3. Pension Related Benefits

    a) Defined contribution plan***
    b) Defined benefit plan****
    c) Group RRSP plan*****

4. Paid Leave Benefits

    a) Vacation leave
    b) Sick leave
    c) Maternity/Paternity leave
    d) Floating days

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[12] These are the non-wage benefits on which information is collected in the WES employer questionnaire.

*** Other non-wage benefits:** Moving and Storage Expenses, Low Cost or Interest Free Loans, Discount of Merchandise, Subsidised or Free Transportation, Automobile for Private Use, Subsidised or Rent Free Housing, Subsidised Meal and Drinks, Subsidised Holidays and Trip Plans, Travelling Expenses for Employee's Family Plan, Subsidised Training Benefits, Air Miles Program or any other frequent flyer plan, Bonus Family Holiday Trips. Include any other non-wage benefits your company provides to its employees.

**** Supplementary medical insurance:** drug co-payment plans, hospital stay co-payment plans, hearing-impaired benefit plan, vision care plan and other medical benefits not covered by provincial health plans.

***** Defined Contribution Plan:** Money Purchase and Profit Sharing.

****** Defined Benefit Plan:** Final/Average Best Earnings, Career Average Earnings, and Flat Benefit.

*******Group RRSP Plan.**

e) Other paid leave

5. Paid Holidays

a) New Year's Day
b) Good Friday
c) Easter Monday
d) Victoria Day
e) Canada Day
f) Saint Jean Baptist Day
g) Civic holiday
h) Labour Day
i) Thanksgiving Day
j) Remembrance Day
k) Christmas Day
l) Boxing Day

Appendix D

Development Milestones for the LCI

Milestone	Objectives	Dates
Background research	• Review of current literature. • Previous experience at STC and in other countries • Review of existing surveys on insurance industry and benefits	♦ April – May 1999
Conceptual framework	• Conceptual description of the four components of the Labour Cost program -(WES, statutory benefits model, Employee Benefits Survey (WES EMPLOYER SURVEY), LFS earnings as the LCI projector and the relationships between the components	♦ May – June 1999
User consultation	• Assess the needs and potential role of the Bank of Canada, the Department of Finance, the Canada Life and Health Insurance in the LCI development • Consultation with the Americans and the Australians	♦ June – July 1999 ♦ October 1999
Survey content determination	• Use the information collected in the background research, conceptual framework and user consultation	♦ July – August 1999
Pilot of the integrated WES-LCI Employer questionnaire	• Design materials to notify respondents of survey objectives • Preparation of collection tools/materials • Survey a sample of benefit sponsors in order to test the process appropriate to the collection methodology and sampling structure in an integrated fashion • Develop positive relationships with respondents	♦ April 2000 ♦ March – August 2000 ♦ October – November 2000 ♦ October 2000
Pilot Survey Assessment Report	• Produce clean file with survey weights • Achievement of Survey	♦ December 2000 – Jan. 2001 ♦ February 2001

Milestone	Objectives	Dates
	Objectives - Evaluate quality of data captured between LCI small test and WES-LCI pilot survey - design of sample - respondent relations • Cost Assessment - fixed costs - actual vs estimated costs - estimate costs under production environment • Integration of LCI content into WES wave 3	♦ February 2001 ♦ March 2001
Linking pilot information to the WES 1999 and 2000 data	• Establish benchmark using WES and WES-LCI pilot data • Preliminary analysis of Labour Cost data in terms of client needs and issues raised by advisory committee • Compare modeled average benefit cost data using WES YEARS 1 and 2 employer data with WES-LCI pilot data	♦ February – April 2001
Annual collection of WES –LCI Integrated Approach	• LCI fully integrated into WES wave 3 and 4 collection processes	♦ April – July 2001 (Wave 3) ♦ April – July 2002 (Wave 4)
Establish preliminary annual LCI index Assumption: Using benchmark data from YEAR 3.	• Development of the inaugural annual LCI • - integration and testing of modular components - analysis of the annual time series - fine-tuning of survey processes	♦ May 2001 – February 2002
First release of the Labour Cost Indices 2001 and 2002	• Program fully in place and able to support analytical and dissemination schedule.	♦ Fall 2003

References

A look at the Employment Cost Index; The Connecticut Economic Digest, October, 1996.

Abate, Joseph; U.S. Employee Benefits: Less of a Good Thing?" Global Weekly Monitor, 1998, Lehman Borthers, January 23, P.6.

Albert, E. Schwenk, "Employment Cost Index Rebased to June 1990", Monthly Labour Review, April 1990.

Anderson, Kay E., Philip M. Doyle and Albert E. Schwenk, "Measuring Union-Nonunion Earnings Differences", Monthly Labour Review, June 1990.

Braden, Bradley R. and Stephanie L. Hyland, " Cost of Employee Compensation in Public and Private Sectors" , Monthly Labour review May 1993.

Bureau of Labour Statistics; Employment Cost index in BLS Handbook of Methods, Chapter 8, U.S. Department of Labour, April 1988, Bulletin 2285.

Canadian Life and Health Insurance Facts, 1998 edition.

Employment Cost Trends, ftp://146.142/pub/news.release/history/eci.012798.new

Employment Cost Trends, http:/stats.bls.gov/ectexamp.html

Employment Cost Trends, http:/stats.bls.gov/ectoverv.html

Employment Cost Trends, http:/stats.bls.gov/news.release/eci.tn.html

Employment Cost Trends, http:/www.clev.frb.org/research/Et97/0297/labmkt2.html

Employment Cost Trends, http:/www.moneyminded.com/investor/start/88tlca11.html

Employment, Earnings and Hours, January 1999, Catalogue no. 72-002-XPB, Statistics Canada.

Garner, Alan C. ; A closer Look at the Employment Cost Index, BLS WEBSITE.

Griggs and Santow Incorporated; The Griggs and Santow Report, January 26, 1998, p1. Leham Brothers, January 23, p6.

Lettau, Michael K., Mark A. Loewenstein and Aaron Cushner, "Is the ECI sensitive to Method of Aggregation" Monthly Labour Review , July 1988.

Levin, Beth, "The Employment Cost Index: Recent Trends and Expansion", Monthly Labour Review , May 1982.

Nathan, Felicia, "Analyzing Employer's Costs for Wages, Salaries, and Benefits", Monthly Labour Review, October 1987.

O'Conor, Karen and William Wong, "Measuring the precision of the Employment Cost Index" Monthly Labour Review, March 1989.

Review of Federal Reserve Bank of Kansas City, Third Quarter 1998.

Ritter, Joseph A.; Opening Pandora's Box: The Measurement of Average Wages, the Method of Aggregation?", Federal Reserve Bank of St. Louis Review March-April 1996.

Statistical offices of different countries in Europe, ILO and EUROSTAT. Some papers were obtained directly with the officers in-charge of LCI in those countries and organizations.

Shiefer, Victor J., "Employment Cost Index: A Measure of Change in the 'Price of Labour', Monthly Labour Review , July 1975.

Shiefer, Victor J., "How Benefits will be Incorporated into the Employment Cost index", Monthly Labour Review, January 1978.

Smith, Patricia B., "The Employment Cost Index in 1980: A First Look at the Total Compensation", Monthly Labour Review, June 1981.

Wood, Donald G. "Employment Cost Index Series to Replace Hourly Earnings Index", Monthly Labour Review , May 1982.