

Methodology **The Salary Assessor® & Survey**

ERI Economic Research Institute was founded over 30 years ago to provide compensation applications for private and public organizations. ERI's applications are available to management, analysts and consultants and are now widely used by client organizations. Subscribers include corporate compensation, relocation, human resources, and other professionals, as well as independent consultants and counselors, and US and Canadian public sector administrators (including military, law enforcement, city/county, state/provincial, and federal government pay administrators).

ERI compiles the most robust salary, cost-of-living, and executive compensation survey data available, with current market data for more than 1,000 industry sectors. The majority of the Fortune 500 and thousands of other small and medium sized organizations rely on ERI data and analytics for compensation and salary planning, relocations, disability determinations, board presentations, and setting branch office salary structures in the United States, Canada, and worldwide.

ERI is a leader in the collection, and analysis of compensation, occupation, and cost-of-living data. All data are employer-provided and come from a variety of sources. Survey data are collected through internally conducted salary surveys and the purchase of salary surveys from survey vendors. Additional data are gathered through the digitization of Proxy and 10-K data and Freedom of Information Requests in the US. Compensation data are compiled in terms of mean and median salaries for jobs of similar duties, responsibilities, skills, and functions through an extensive job matching process. ERI produces surveys and application analyses by which managers, advisors, and Boards of Directors may make recommendations and/or decisions. ERI does not provide fee-for-service consulting; our sole focus is providing valid and reliable information to our subscribers.

Overview

The methodology for the **Salary Assessor & Survey** application and databases, as found below is further defined in the help menus. All figures are reported in local currencies.

The **Salary Assessor (SA)** application and databases provide detailed pay analysis for the US, Canada, UK, Europe, and other areas around the globe. These data help users to market price jobs and assess an organization's wage/salary competitiveness and internal equity. The **Salary Assessor & Survey** application database assists with precise up-to-date evaluations of market pay.

ERI's data are primarily derived from in-house salary surveys. Data are also extracted from publicly filed tax returns leased from other survey vendors or gained from Freedom of Information Act (FOIA) requests. Data that are collected from third-party sources are then matched to ERI's internal job descriptions. First, multiple independent raters go through the job descriptions in the surveys and match the jobs in the surveys to ERI's internal job descriptions. Factors such as level, education, industry and 98 additional hard metrics are considered for each job.

Job data is matched and reported according to the position description. Data is adjusted for geographic area, industry (matched to SIC or NACE), organization size (revenue, assets, or number of employees), and salary planning date (data is trended forwards and backwards through time series analysis).

The **Salary Assessor & Survey** application and databases are designed to be as simple to access as taking a survey down from the shelf, and looking up survey data for a particular job. Unlike a book, however, this program will perform functions that must otherwise be calculated by hand. In contrast to the task of comparing many surveys' data against one another and determining what your organization should pay the job, the **Salary Assessor & Survey** application and databases have already performed this compensation analyst work for you, compiling and analyzing more surveys over a longer time period than you would likely be able to reproduce yourself.

The **Salary Assessor & Survey** application database does not reproduce data reported by any copyrighted, privately conducted survey. This would be copyright infringement and would undermine the sales of individual surveys. Many surveys are produced by small proprietors struggling to maintain quality control in an industry dominated by large consulting firms and federal government surveys. These survey publishers need both your and our support. **ERI** performs compilation and analysis of these data; that is, the examination, projection and refinement of combined survey data based upon **ERI's** research methods.

Jobs found within the **Salary Assessor & Survey** application database are those for which multiple salary survey sources are available and for which reported data has been condensed, modified, and compiled.

Survey Means and Medians

Mean

The salary calculations available from the **Salary Assessor & Survey** application and databases are the result of salary surveys collected and analyzed by **ERI**. **ERI** has over twenty-five years of experience in this field. National average data is carefully constructed. It is noted that individual salary surveys may or may not represent a true weighted average or mean. However, **ERI's** overall results drawn from multiple salary surveys should represent more accurately a true weighted average or mean. **ERI** defines mean as the weighted average salary resulting from **ERI's** analysis of all survey data available for the particular job, industry, company size, and geographic area. Since salary surveys have different effective dates, **ERI** selects a calendar year's quarter beginning date as a common benchmark and updates all salary survey data to that date, so that "apples are compared to apples."

Median

ERI defines the median as the value at which half of all incumbents earn more and half of all incumbents earn less than the calculated salary. Until 1997, **ERI** had chosen to collect, calculate, and report median salary levels (only) rather than weighted averages or other measures of central tendency. The median value tends to be less influenced by extremes than a survey mean. As wage and salary distributions are skewed for most jobs, the mean generally falls close to, but slightly higher than, the median. For this reason, some view a median value as a better target for market pricing and competitive pay. Based upon subscriber requests, **ERI** reports both survey mean and median wages/salaries and defaults initial analyses to the survey mean.

Salaries by Experience/Size Tables

The Salaries by Experience/Size table provides detailed pay range data for a single job, matched by Survey Description. Subscribers may view pay data by percentile, median, and mean. These jobs may be cross referenced by years of experience for jobs, non-executive jobs and by revenue/size for executive jobs. Pay may be further refined by subscriber specification of geographic area, industry, organization size, and salary planning date.

Base Salaries

The Base Salary Table and Graph illustrate how a salary continuously changes by organization size and years of experience.

Total Compensation

The Total Compensation Table and Graph illustrate how the total salary (base salary + incentive) continuously changes as the organization size and years of experience change. Please note: Incentive data represents an average of all employees in the job, including organization data where no incentive or cash bonus was paid.

Incentive

The Incentive Table and Graph illustrate average incentives paid according to organization size and years of experience. This average includes all survey data where no incentive or cash bonus is reported paid. It therefore represents an average of all employees in the job, rather than the norms for organizations that pay incentives.

Salaries by Level Table

While **ERI** has been gathering salary data since the 1980's, our original data was gathered by years of experience and all incumbent market values. In the late 1990's we also began to gather data by levels within a job, and the Salaries by Level tab was added to the **Salary Assessor** in 2003.

The data sources used for reporting by level differ from those sources used for salaries by years of experience. The **Salary Assessor's** Salaries by Level tab is based on matching **ERI** Survey Descriptions with job/survey descriptions of available salary survey sources. (Please also see the Definition of Levels topic. These definitions are printed at the bottom of the Salaries by Level report in the **Salary Assessor** Descriptions section.)

Benchmark List Table

To assist with planning or auditing pay for multiple jobs in one location, the Benchmark List table enables

users to enter and view the salaries for multiple jobs in one location. This allows users to view a list of benchmark or key jobs with ERI calculated salaries and compare current pay practices to local market pricing calculations. In addition, the Benchmark List allows users to view selected jobs within a selected industry. These are jobs that have been found to exist with each industry and may assist users in creating benchmark lists of jobs within the organization.

Geographic List Table

To assist with planning or auditing pay for one job in multiple (branch) locations, the multiple locations Geographic List table enables you to enter and view up to 99 areas' salaries for one job. On one table (or one printout report), you may view a listing of branch offices with **ERI** calculated salaries, and compare your current pay practice to local market pricing.

Calculation of Populations

ERI uses a Total Survey Population when stating the number of employees involved in ERI's time series analysis for a given job. In the **Salary Assessor**, this information is available below the job. The Survey Population window provides a range estimate of sample size for that occupation. ERI reports sample sizes as range estimates for two reasons:

1. Reporting sample sizes by range is necessary because we have many surveys which are used consistently over multiple years. Within these surveys, the same organization may participate over multiple years. This consistency is desirable as it gives us a cleaner look at salary growth; however, it makes reporting sample sizes more complicated. We could report unique observations with or without taking the organization into account, but neither value will be truly representative of the volume of data behind the salary figure.
2. ERI purchases or trades data with third-party salary surveys. These survey firms generally provide lists of participating organizations for the entire survey, not by job. Because of this, ERI does not have the granularity of data to provide one number for the employee population.

These complications in sample size reporting are why ERI provides ranges instead of a single number for sample sizes. We feel that this is the most accurate and transparent method for communicating the scope of our databases to customers.

For this reason, ERI's Total Survey Population for a given job in a given area is expressed as grouped data with the following groupings utilized:

<20	<20 surveyed employees, contiguous data included
>= 20 & <35	Between 20 and 34 surveyed employees
>= 35 & <60	Between 30 and 59 surveyed employees
>= 60 & <95	Between 60 and 94 surveyed employees
>= 95 & <140	Between 95 and 139 surveyed employees
>= 140 & <195	Between 140 and 194 surveyed employees
>= 195 & <260	Between 195 and 259 surveyed employees
>= 260 & <420	Between 260 and 419 surveyed employees
>= 420 & <515	Between 420 and 514 surveyed employees
>= 515 & <620	Between 515 and 619 surveyed employees
>= 620 & <735	Between 620 and 734 surveyed employees
>= 735 & <860	Between 735 and 859 surveyed employees
>= 860 & <995	Between 860 and 994 surveyed employees
>= 995 & <1140	Between 995 and 1139 surveyed employees
>= 1140 & <1295	Between 1140 and 1294 surveyed employees
>= 1295 & <1460	Between 1295 and 1459 surveyed employees
>= 1460 & <1635	Between 1460 and 1634 surveyed employees
>= 1635 & <1820	Between 1635 and 1819 surveyed employees
>= 1820 & <2015	Between 1820 and 2014 surveyed employees
>= 2015 & <2220	Between 2015 and 2219 surveyed employees
>= 2220 & <2435	Between 2220 and 2434 surveyed employees
>= 2435 & <2660	Between 2435 and 2659 surveyed employees
>= 2660 & <2895	Between 2660 and 2894 surveyed employees
>= 2895 & <3140	Between 2895 and 3139 surveyed employees
>= 3140 & <3395	Between 3140 and 3394 surveyed employees
>= 3395 & <3660	Between 3395 and 3659 surveyed employees

>= 3660 & <3935	Between 3660 and 3934 surveyed employees
>= 3935 & <4220	Between 3935 and 4219 surveyed employees
>= 4220 & <4515	Between 4220 and 4514 surveyed employees
>= 4515 & <4820	Between 4515 and 4819 surveyed employees
>= 4820 & <5135	Between 4820 and 5134 surveyed employees
>= 5135 & <5460	Between 5135 and 5459 surveyed employees
>= 5460 & <5795	Between 5460 and 5794 surveyed employees
>= 5795 & <6140	Between 5795 and 6139 surveyed employees
>= 6140 & <6495	Between 6140 and 6494 surveyed employees
>= 6495 & <6860	Between 6495 and 6859 surveyed employees
>= 6860 & <7235	Between 6860 and 7234 surveyed employees
>= 7235 & <7620	Between 7235 and 7619 surveyed employees
>= 7620 & <8015	Between 7620 and 8014 surveyed employees
>= 8015 & <8420	Between 8015 and 8419 surveyed employees
>= 8420 & <8835	Between 8420 and 8834 surveyed employees
>= 8835 & <9260	Between 8835 and 9259 surveyed employees

Statistical Methodology

The **Salary Assessor** and **Executive Compensation Assessor & Survey** utilize polynomial regression analyses techniques.

Geography and Industry

ERI's analysis of salary survey data for unique locations and industries is dependent on the occupation being analyzed. This is because industry and location have different amounts of influence over an occupation's salary depending on the occupation. These differences generally exist between executive and non-executive occupations.

Non-executive occupations are frequently influenced by geography more than industry. This is because organizations will frequently have to compete for labor across industries. An accountant may search for work in multiple industries as their skills are transferrable. ERI is able to provide local data for these occupations by expanding analyses to other industries that would be competing for the same labor. The analyses capture any differences that may exist between the industries by examining the differences between those industries within other local labor markets.

Executive occupations are frequently influenced by industry more than geography. This is because competition for executive labor frequently exists on a national level and also because industry knowledge is more frequently critical to success in these occupations. ERI accurately captures the market rate for these occupations by expanding the analysis to other comparable organizations within the same industry. Geographic differences are captured by examining relative value patterns within an industry to other, related industries.

These methods provide a clear picture of how an occupation exists within a labor market, while accounting for differences which may exist between the industries. Over the years, the accuracy of these methods has been found to be quite accurate. The accuracy has been demonstrated by later salary surveys which have included the occupation, industry, and location in question and from company/customer feedback.

User Defined Averages

Suburbs and geographic areas may be grouped as *User Defined Averages* and reflect defined labor market pools or geographic zones. A labor market area by radius can also be defined.

Canada Average vs. United States Average

ERI profiles costs and salaries for Canadian job incumbents, using Canadian market prices for overall average spending patterns (home size, goods and services spending patterns), and using Canadian effective income tax estimates, which vary significantly from the US. The Canadian Benchmark earning and spending levels are not simply converted US dollars benchmarks. Because consumer inflation rates, currency exchange rates, and local pay rates are not statistically related, all Canadian costs and salaries are stored in **ERI** databases in Canadian dollars. The quarterly effective exchange rate will change each quarter and influence the appearance of international comparisons from quarter to quarter (in addition to the influence of the inclusion of new survey data, trending to a new quarterly effective date, and new United States Average to Canada Average relationships).

Because Canadian provinces and industries value jobs differently than their US counterparts, and because expenditure patterns and costs also vary from US patterns, **ERI** has added numerous Canadian sources for both wage/salary and cost-of-living calculations. The data for Canadian cities are those costs and wage/salary levels that an employee could assume to face either after moving within Canada or after moving from the United States (and becoming a temporary Canadian resident).

Populations - BLS Area (MSA)

A Metropolitan Statistical Area (MSA) may cross state lines. It is typically made up of a collection of counties (except for MA and CT). **ERI** has taken this construct and applied it to other countries (Canada's counties, UK's unitary aggregates, etc.).

BOS Area

A state defined, non-MSA "Balance of State" area with some states having multiple BOS areas. In August of 2006, the US Occupational Employment Statistics (OEWS) surveys were redefined in terms of areas (only the State of Delaware was unaffected). These reorganizations were reported in the 2007 **Assessor Series** releases.

Cell

Population and wage data provided by the US Government are defined by cells (Nationwide, Statewide, BLS area or BOS Area). BLS surveys 75` occupations in 515 (plus state) areas, for a total of 396,550 detail level cells. They then attempt to estimate various statistics for each cell. For the normal or official OEWS estimates found on the national Internet site, BLS looks only at data collected from the relevant area when calculating the cell estimates. In order to release the data, the value must meet statistical and confidentiality criteria. In the official results, if the statistical or confidentiality criteria are not met, the cell is left null. For example, an official BLS-OEWS report for the state of Iowa may include only 200-300 occupations in the rural area because the other cells are suppressed. It may include 500-600 for the MSA's and all 770 for the statewide estimates. Census data follows a similar grouping of cell path with 477 occupations and 1,430 census sectors.

Variance Statistics - A Note for Expert Witnesses

The variance statistics window is designed for use in court when expert witnesses may need a measure of error. To reach this end, ERI provides the variance information from the largest survey used in ERI's research efforts: the BLS survey. Please note: the BLS survey is not a central data source for the **Salary Assessor**, but it is still used as a quality control measure. The variance statistics from the BLS survey represent a conservative (and defensible) measure of error for the **Salary Assessor**. The sample size is larger because the occupation is defined by SOC as opposed to occupation in this particular window. In sum, this metric is tailored for reporting error rates in a courtroom. Please note: the BLS survey is used for the United States. Variance statistics for Canadian and international locations are derived from locally sourced surveys similar to the method used in the United States.

Variance Statistics Definitions

City

Populations of employees in a job group are defined across a wide geographic area. Reported populations are for areas from which workers may commute and, according to the OEWS, are typically much larger than a city metropolitan area. While a city name is shown, the population, salaries, and other statistics represent values for the Survey Area.

Area

These are as defined by OEWS in the US; **ERI** divides Canada geographically using the same methodology by which the BLS and Employment & Training Administration (ETA) define US areas. UK/Europe survey areas are defined by ERI. ERI has aggregated all geographic areas so that all workforce/commute areas are covered.

Survey

Data are derived from OEWS datasets and Canadian Census. UK differentials are calculated from data provided by the UK Office of National Statistics and gathered by ERI's interactive survey site. Other countries' data (Netherlands, Denmark, Austria, Belgium, Portugal, etc.) are created from data similarly leased from respective national statistic offices.

Standard Error

Early in the Year 2000, the OEWS began to report Relative Standard Error (RSE). To quote the OEWS Technical Notes:

Estimates derived from different samples would differ from each other. The variance of a survey estimate is a measure of the variation among the estimates from all possible samples. The standard error of a survey estimate is the square root of its variance; the relative standard error is the ratio of the standard error to the estimate itself. The sample estimate and its standard error allowed OES to construct an interval estimate with a prescribed level of confidence that the interval will include the mean value of the estimates from all possible samples.

To illustrate, if all possible samples were selected, and if each of these were surveyed under essentially the same conditions, and an estimate and its estimated sampling error were calculated from each sample, then approximately 90 percent of the intervals from 1.6 standard errors below to 1.6 standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 90-percent confidence interval.

Approximately 95 percent of the intervals from two standard errors below to two standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 95-percent confidence interval. For example, suppose that an estimated occupational employment total is 5,000 with an associated relative standard error of two percent. Based on this data, the standard error of the estimate is 100 ($= 5,000 \times 0.02$) and the 95-percent confidence interval for the estimate is (5,000 +/- 200X2) or (4,600 to 5,400). This confidence interval is one of many that could be constructed based on the same sample design. Approximately 95 percent of these confidence intervals would encompass the average value of the estimates from all possible samples.

The Relative Standard Errors shown are those reported by the OEWS for the job groups in each state or territory. Standard Errors shown are **ERI** estimates of the highest possible errors for the **Salary Assessor & Survey** application database, as we would expect the Standard Error to decrease as sample sizes increase. Default values illustrating that these calculations have not yet been finalized are indicated as 00.00, 22.00, and/or 33.00. Users should disregard these preliminary numbers when found.

UK Standard Errors are created from data provided by the Office of National Statistics as are other countries' data.

ERI Statement as to the Relevance and Reliability of Data

Relevance is totally determinable by the circumstances and situation presented. **ERI** enables subscribers to conduct analyses and create presentations of salary, executive compensation, benefit, and cost of living survey data. Reliability is described in a non-exclusive summary:

Theory/Technique Demonstrations

Methodologies accompany each **Assessor Series** application. These methodologies include definitions of terms, examples of calculations, and identifications of sources and data updates.

Subject to Publication and Peer Review

ERI's peers are its competitors, those firms that also provide data analyses to their clients. Unlike **ERI**, which solicits an annual subscription, most compensation and benefit consulting firms charge an hourly rate for their research services. Suffice it to say, all the major consulting firms have purchased subscriptions so that their consultants could utilize **ERI** analyses. **ERI** data are used by these firms in their consulting with their clients. **ERI** data and analyzes are under constant review and critique by its competitors. **ERI**, unlike these firms, provides no fee-for-service/time consulting.

Known or Potential Rate of Error

Each **Assessor Series** application database illustrates via a Variance Statistics link, the beginning of a statistical overview of **ERI** data. Statistics are reported as derived from just one survey source for all salary and compensation presentations (so that copyright restrictions are not violated). **ERI** accumulates many survey sources to compile its analyses. Hence the data illustrated may be, in **ERI's** estimate, considered to be the highest possible standard error that might exist with each analysis. **Assessor Series** application database results are, by logic, more robust than the standard error displayed and reported.

General Level of Acceptance within the Discipline's Community

Thousands of organizations subscribe each year to ERI's analyses. Special extracts of ERI databases are purchased annually by large organizations. ERI exhibits at major tradeshows (e.g., WaW and SHRM). ERI data is used as source data by major publications and job boards. WorldatWork, NASBA, SHRM, and HRCI accept ERI Distance Learning Center courses for professional maintenance and recertification continuing education credit. Major US employers rely upon ERI data as cited in corporate proxy filings (see <http://www.erieri.com/ExecutiveCompensationProxyData>).

Data Plots

Data plots are available under the **Salaries by Experience/Size** tab of the **Salary Assessor & Survey** application database. The plot of dots found in the **Salary Assessor & Survey** application database combines an estimated distribution and actual plots of publicly disclosed employer salaries. The estimated distributions use a random number generator to create a distribution representing the reported population and standard error from public sources. **ERI** expects that the displayed, estimated measures do not precisely match reality, but rather represent a model of what most likely exists. (It is created and shown because of subscriber requests for a visual presentation.) Actual data points with interactive, pop-up content details, adjusted for the location and industry, may be supplied as well, as available, showing the effective date and publication location of pay information voluntarily disclosed by the survey source.

Industry Codes

ERI utilizes an **enhanced Standard Industrial Classification (eSIC)** code based on the replaced 1987 US SIC versus the now used North American Industry Classification System (NAICS). Several reasons for ERI's use of its own industry code **eSIC** exist: 1) The North American Classification System (NAICS), was under dispute between Canada and the United States until agreements were settled in 2007. Statistics Canada, the Economic Classification Policy Committee (ECPC) of the United States, and Mexico's Instituto Nacional de Estadística, Geografía e Informática (INEGI) agreed upon the limited industry revisions for NAICS 2007. The revision went into effect for the reference year 2007 in Canada and the United States and for 2009 in Mexico. 2) Agreements took place in 2007 for the International Standard Industrial Classification (ISIC) of all Economic Activities of the United Nations and the Statistical Classification of Economic Activities in the European Community (NACE, Nomenclature statistique des activités économiques dans la communauté européenne). The revised ISIC (Rev. 4) was adopted by the UN Statistical Commission in March 2006 for world-wide statistical classification of activities and products. NACE is the European-level statistical classification of economic activities, with the first reference year for NACE Rev. 2 being 2008. **ERI** maintains a crosswalk for these files, with Mexico, Canada, and the US having their own unique NAICS. 3) Many countries copyright their postal codes and unique industrial code variations; and whereas **ERI** leases these rights from Geocoder.ca and the UK National Statistics Office, it is uneconomical to do so with 25 different country variations to the above systems. 4) Disputes exist within Europe, as the UK SIC is now an extended/evolved version of NACE. 5) "On April 9, 1997, the Office of Management and Budget (OMB) announced its decision to adopt the NAICS as the industry classification system used by the statistical agencies of the United States and in doing so NAICS replaced the 1987 Standard Industrial Classification." (See www.bls.gov). Note the term, "statistical agency," as disagreements are not necessarily limited to between countries. 6) "Statistical agency" does not include the US Securities and Exchange Commission that utilizes its own unique 445 industry set of SIC-like codes. **ERI** utilizes the SEC 10-Ks, 8-Ks, and proxies as a key data source in the creation of the **Executive Compensation Assessor & Survey**. 7) The US IRS, although asking for an NAICS code on personal and corporate tax returns, uses an "Activity Code" for nonprofit organizations formed before 1998 or the National Tax Exempt Entities code (NTEE) code for those formed thereafter. (Form 990s report neither; this code is taken from the IRS Masterfile of nonprofits, and yes, there is a gap in years when two other code types were used.) **ERI** collects and analyzes all Form 990s (nonprofits include most health care services, such as hospitals). 8) ERI leases certain financial data from private providers under Distributor [License] Agreements. Other financial information within the Licensed Products, used with permission, may be proprietary to other entities. These sources have their own unique SIC-like codes that require concordance. 9) For historical purposes and cross-industry and country comparisons, **ERI's** research requires a common industrial classification code -- including use with ERI archive data where Principal Business Activity codes (PBAs), although discontinued, are the norm. Over 30 major and minor industry code series exist in ERI's datasets.

ERI Economic Research Institute is a licensed user of postal code and latitude and longitude data from the United States Postal Service (USPS). Canadian Postal Codes are based on crowdsourced data licensed from Geocoder.ca. Contains data adapted from Statistics Canada, 2016 Census Program. This does not constitute an endorsement by Statistics Canada of this product. Contains Ordnance Survey data © Crown copyright and database right 2022. Contains Royal Mail data © Royal Mail copyright and database right 2022. Contains National Statistics data © Crown copyright and database right 2022.

ERI Economic Research Institute
111 Academy Drive, Suite 270, Irvine, CA, 92617 USA
Telephone (800) 627-3697
Email info.eri@erieri.com
<http://www.erieri.com>

Assessor Series application and database access by license agreement only.

**Copyright © 1989-2022 ERI Economic Research Institute, Inc.
Patent Nos. 6,862,596 and 7,647,322**