

Wage Indexation

- The purpose of indexing wages is to keep the purchasing power of a given dollar wage constant; this is what economists call the ***real wage***.
- The purchasing power of a dollar wage is affected by changes in the **price level** (average of all prices).
 - If the price level rises (inflation) then the real wage falls.
 - If the price level decreases (deflation) then the real wage rises.

- In the long run, the Federal Reserve (“FED”) controls changes in the price level but they have only partial control from month-to-month.
- The FED is unofficially committed to the price level **rising 2% per year**, although they have been below that target the last several years.

- As a practical matter it is very difficult to measure changes in all prices, especially in a timely manner. Therefore, economists rely on estimations or proxies for the price level. Some index proxies include:
 - 1) Consumer Price Index (CPI)
 - 2) Producer Price Index (PPI)
 - 3) GDP Price Deflator
- Because CPI focuses on expenditures of consumers, it is the index most appropriate for adjusting the nominal (dollar) wage to keep purchasing power constant.

- The two most commonly used CPI indexes

1) **CPI-U** All Urban Consumers

- Based on expenditures of all families in urban areas.
- Represents about 88% of the total US population

2) **CPI-W** Urban Wage Earners and Clerical Workers

- Families in urban areas where more than one-half of the family's income is earned from clerical or hourly-wage occupations
- Represents about 29% of the total US population

- CPI-W is used for escalation (wage indexation) primarily in blue-collar cost-of-living adjustments (COLA)
- CPI-U is used in most other escalation agreements
- There are subset indexes, measuring price level changes from smaller geographical areas. However, their sample sizes are much smaller and, as such, subject to substantial larger sampling errors (volatility).
- There are other indexes that make “seasonal adjustments” but due to time lag issues, these are seldom used for wage indexation.

Issues to Consider – *applying an average*

- Any index is an average. Therefore, individual price changes will be higher and lower than the average.
- The average change is a good approximation of the change in purchasing power of an employee. However, an employer's ability to pay is based on a specific price – which may bear no correlation to the average change.
- As long as the average index change is relatively small, this minimizes the probability that the difference between the two will be significant.

Issues to Consider – *Upward Bias in CPI*

- It is well known amongst economists that standard CPI indexes (both CPI-U and CPI-W) overestimate actual price level changes. The reason is well understood.
- For this reason the Bureau of Labor Statistics (BLS) computes another CPI index, call a “chained” index that corrects for the bias. The aforementioned indexes are called “unchained.”
- While this is the most “theoretically correct” CPI index its lag in estimation does not make it practical, as of now, for wage indexation

Issues to Consider – *Include Deflation*

- Proper indexing must make adjustments when the price index rises (inflation) **AND** when the price index falls (deflation).
- To ignore deflation is inconsistent with the purpose of indexing.
- While the event of significant deflation is unlikely, to ignore it has potential for serious economic instability.

Computation Issue

- A common method of computing the adjustment is to use the index number for one month (e.g. September) and compare it to the index number 12 months earlier.
- For example, for Sept 2014 CPI-W index was 234.170
for Sept 2013 CPI-W index was 230.537

Thus the adjustment is 1.576%.

This problem with this method is that it is *volatile*. If the adjustment month of December-to-December had been chosen, the change would have been only 0.32%.

In the table below, annual (month-to-month) changes are computed for the last 15 years. Notice the wide variation in adjustments depending on the month chosen. For example, in 2009 the variation went from 3.364% (Dec) to -2.671% (July), a difference of over 6%. Even when change in an index is small the variation can be significant.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	3.68357	3.54354	2.79929	3.27381	3.68609	3.19149	2.5974	2.658	2.58216	1.99297	1.63839	1.28881
2002	0.87362	0.75406	1.21669	1.32565	0.80275	0.74456	1.32336	1.61105	1.25858	1.89655	2.13011	2.37131
2003	2.59815	3.16638	3.2055	2.27531	2.04778	2.10347	1.98751	2.09513	2.25989	1.91765	1.57835	1.63842
2004	1.80079	1.5067	1.44204	2.05784	2.95429	3.17372	2.951	2.60677	2.43094	3.20974	3.6626	3.39077
2005	2.98507	2.96866	3.11646	3.65123	2.86952	2.59039	3.29908	3.83784	5.17799	4.66488	3.53319	3.49462
2006	4.13312	3.68393	3.55249	3.68034	4.31579	4.47133	4.29319	3.90422	1.74359	0.92213	1.75801	2.44156
2007	1.83454	2.23687	2.71992	2.5	2.7553	2.6717	2.25904	1.80311	2.76663	3.72487	4.61941	4.34939
2008	4.64924	4.38694	4.25448	4.23886	4.48147	5.55011	6.18753	5.92916	5.41765	3.83874	0.6824	-0.4685
2009	-0.505	-0.2634	-0.9223	-1.3161	-1.8864	-1.9752	-2.6712	-1.9006	-1.681	-0.2983	2.27067	3.36404
2010	3.33884	2.82331	3.04365	2.90153	2.56258	1.35895	1.6017	1.44396	1.41206	1.45309	1.29574	1.68113
2011	1.80272	2.34822	3.04367	3.63856	4.12378	4.06053	4.1085	4.25807	4.37785	3.92316	3.7546	3.20725
2012	3.14972	3.11766	2.85423	2.37617	1.63531	1.57917	1.2942	1.6702	2.00994	2.21078	1.69739	1.67577
2013	1.48018	1.94368	1.33405	0.85326	1.23522	1.75459	2.00206	1.45471	1.03119	0.77246	1.12006	1.45425
2014	1.55395	0.95943	1.41155	1.96288	2.09983	2.04346	1.93016	1.5936	1.57589	1.52088	1.05528	0.32072

- To minimize volatility, an alternative is to take the average over a year. In other words, compute the annual change for each month and then take the average for all the months (using 12 data points instead of 1). This significantly lowers the volatility.

Year	Ave Annual
2001	2.74463
2002	1.35902
2003	2.23946
2004	2.59893
2005	3.51574
2006	3.24164
2007	2.8534
2008	4.09568
2009	-0.6487
2010	2.07638
2011	3.55391
2012	2.10588
2013	1.36964
2014	1.5023

Examples -- Seattle

- The index used is CPI-W, the adjustment period used is September-to-September, and ignores deflation
- Uses a broad, less volatile measure
- Month-to-month is more volatile
- Ignoring deflation makes the impact of volatility worse

Examples – Tacoma Initiative

- Index is CPI-W for Seattle-Tacoma-Bremerton, the adjustment period used is September-to-September, and deflation is ignored.
- Small sub-sample used is volatile
- Adjustment method is volatile
- Ignoring deflation makes impact of volatility worse

Things to consider

- For the benefit of both the employees and employers, try to minimize the volatility
- Proper indexing must include deflation; while the probability of deflation is low, to ignore it when it happens is serious
- Consider putting in some type of “safety valve” if the change in the price level exceeds some number, say plus or minus 5%. When this happens the probability of a significant difference between specific prices and the averages increases and becomes problematic.