

## Constructing and updating a cost-of-living index for the purpose of ensuring purchasing power parity of the remuneration of expatriate officials

Dr. Yansaneh, Ibrahim S.

*International Civil Service Commission, United Nations*

*2 United Nations Plaza, 10<sup>th</sup> Floor*

*New York, NY 10017, USA*

*E-mail: yansaneh@un.org*

Mr. Pagan, Roberto

*International Civil Service Commission, United Nations*

*2 United Nations Plaza, 10<sup>th</sup> Floor*

*New York, NY 10017, USA*

*E-mail: pagan@un.org*

### Introduction

The post adjustment system (PAS) refers to the set of rules and procedures governing the remuneration of officials of the United Nations (UN) system. Its overall goal is to equalize the purchasing power of the remuneration of UN officials serving in various locations around the world with the salaries of their counterparts in New York, which is the base of the system. It is designed to reflect the international character of the UN staff population and to be robust enough to be applicable to 200-odd duty stations with widely varying levels of general economic development, stability of such economic indicators as inflation and exchange rates of local currencies relative to the US Dollar; as well as the number, composition, and turnover of staff.

Duty stations that are similar to the base of the system in terms of socio-economic development, typically in North America and Europe, are classified as Group I duty stations. Those in the rest of the world, are classified as Group II duty stations. (See the distribution of the UN staff below).

#### *Distribution of target staff population by region and type of duty station*

*As of 31 December 2009*

<b>Region</b>	<b>Type of duty station</b>		<b>Total</b>
	<b>Group I</b>	<b>Group II</b>	
Africa	-	7,193	7,193
Asia	112	3,682	3,794
Australia and Oceania	4	312	316
Europe	11,116	409	11,525
North America	5,580	83	5,663
South America and the Caribbean	-	1,344	1,344
<b>Total</b>	<b>16,812</b>	<b>13,023</b>	<b>29,835</b>

The International Civil Service Commission (ICSC), an independent expert body established by the General Assembly of the United Nations, is responsible for the operation of the PAS, with statistical/technical assistance provided by the Advisory Committee on Post Adjustment Questions (ACPAQ), an expert panel comprised of experienced price statisticians.

### The post adjustment index

The post adjustment index (PAI) for a duty station reflects a simultaneous spatial and a temporal comparison of cost of living between the duty station and New York. It consists of the following components:

- **In-area, excluding housing** - relates to living costs incurred locally. It is structured according to the Classification of Individual Consumption According to Purpose (COICOP) and the cost-of-living relativities of its 84 basic headings are calculated on the basis of price data for a basket of around 300 goods and services collected at the duty station and in New York;

- **Housing** - relates to rent and other housing-related costs, including costs for maintenance, utilities, and other housing costs. This information is obtained mostly via a housing questionnaire.

- **Pension Contribution** - relates to the amount of pension contribution paid by staff, obtained from administrative sources.

- **Medical Insurance** - relates to the amount of insurance premiums paid by staff, obtained from administrative sources; and

- **Out-of-Area** - relates to expenditures outside the country of the duty station. While the weight of this component is determined from out-of-area expenditures reported by survey respondents, the change in cost of living for this component is approximated by an out-of-area index, calculated as a weighted arithmetic average of US dollarized general CPIs from 26 selected countries.

At any point in time, the PAI is calculated as an adjusted, modified-Walsh index, given by the following formula:

$$PAI = A \cdot \prod_{i=1}^m RF_i \cdot P_i^{v_i} + RF \cdot \left( H \cdot \frac{h_i}{h_0} + PC \cdot \frac{C_i}{C_0} + MI \cdot \frac{I_i}{I_0} + OA \cdot \frac{O_i}{O_0} \right)$$

where

- A, H, PC, MI and OA denote the relative weights of the in-area (excluding housing), housing, pension contribution, medical insurance and out-of-area components;

- m denotes the number of basic headings in the in-area (excluding housing) component;

- $P_i$  and  $v_i$  denote, respectively, the price ratio and proportion of expenditures of the  $i$ -th basic heading in the in-area (excluding housing) component;

- RF is the general rebasing factor, which converts information about the cost-of-living index into information about salary required to maintain purchasing power parity with New York.  $RF_i$  is an adjustment of RF for basic headings containing electronic and high-technology items (a more cost-effective alternative to the hedonic techniques);

- $h_i$  and  $h_0$  denote, respectively, housing-related expenditures at the location and in New York;

- $C_i$  and  $C_0$  denote, respectively, staff members' average net contribution to the UN Joint Pension Fund at the duty station and in New York;
- $I_i$  and  $I_0$  denote, respectively, staff members' average net contribution to the medical plans available at the location and in New York; and
- $O_i$  and  $O_0$  denote, respectively, the out-of-area index at times  $i$  and  $0$ , when the cost-of-living surveys were conducted at a specific location and in New York respectively. The out-of-area index is common to all locations, including New York, as it measures the change over time of expenditures for purchasing a variable volume of US Dollars in a basket of 26 markets, with different currencies and inflation conditions, in countries around the world where most of the out-of-area expenditures of UN staff members are incurred.

The weights of each of the components (A, H, PC, MI and OA) are determined for a duty station at the time of a cost-of-living survey. They are expressed in US Dollar nominal expenditures for an average staff member at the duty station. Such expenditures are known in advance for PC, whereas for the other components it is determined at the time of the survey by using the results of the household and housing expenditure information collected from the staff. MI is calculated as the expenditure incurred by the average staff member at the duty station in terms of the net premiums applicable to the medical plans available at the duty station. For Group II duty stations, OA is derived from the central value of the band containing the actual percentage out-of-area expenditure, whereas for Group I duty stations, OA is an administratively specified value. H, the weight for housing, is computed from the average net expenditure for rent, maintenance, utilities and other housing expenses. A, the weight for the in-area (excluding housing) component, is obtained by subtracting all the other weights from the net salary of the average staff member. Although variable from duty station to duty station, the above components have the following approximate weights, as a system-wide average across all duty stations: Out-of-Area - 33%; In-area (excluding Housing) - 31%; Housing - 22%; Pension Contribution - 10%; and Medical Insurance - 4%.

A set of common expenditure weights is used for the aggregation of the basic headings belonging to the in-area (excluding housing) component according to a weighted geometric average. Common expenditure weights are the same for all duty stations, and were incorporated into the PAS methodology as a solution to the problems of instability over time and low reliability of expenditure weights when estimated for small duty stations, often subject to high turnover of staff and with very heterogeneous expenditure patterns. The in-area (excluding housing) index is similar to a typical CPI in terms of the aggregation process, the use of the same international classification and in practices of data collection. However, the most obvious difference is that, while a CPI measures change over different points in time in the level of prices of a common basket of goods and services, the in-area (excluding housing) index measures such change over different points in time and space simultaneously and, of course, does that with reference to a target population different from that of the CPI for a country.

The PAI is thus calculated in accordance with the methodology as broadly described above. Other agencies have more or less similar approaches in determining the indices for their own salary adjustment. For example, Eurostat (the statistical office of European Commission), uses correction coefficients as a basis for the remuneration of officials of the European Union. These coefficients are calculated according to a Fisher formula, which can decrease the reference base salary paid in Brussels, the base city for European Union comparisons. Statistics Canada calculates the Post Allowance to

adjust salaries of Canada's diplomatic and other staff serving around the world. In the United States a Cost-of-Living Allowance (COLA) is calculated for this purpose. In addition to governmental and inter-governmental agencies, private sector companies, such as Mercer, operate in the field of cost-of-living measurement for the purpose of salary adjustment of officials serving at different locations.

### **Ensuring purchasing power parity of remuneration**

Cost-of-living surveys are conducted regularly to establish the PAI for each of the duty stations. The surveys comprise:

- a price survey to collect data on prices of a basket of about 300 goods and services (in some cases, for example for the item "car", 19 possible different brands and car models are considered in the basket, bringing the number of surveyed items well over 300); and
- expenditure surveys via self-administered questionnaires, to collect information about household and housing expenditures directly from UN staff, used to determine the weights applied in the aggregation of the various components of the PAI. While most of the organizational and logistical aspects of the surveys are centrally managed by the ICSC, some aspects of the data collection and logistical administration of the surveys is delegated to local UN offices.

The result of a cost-of-living survey is an index, the PAI, used to establish a benchmark level of salary at the duty station, ensuring purchasing power parity with the level of salary in New York, at a given point in time. Since these surveys are conducted with varied frequencies, depending on the type and circumstances of each duty station, the PAI needs to be updated on a monthly basis between surveys so that purchasing power parity is maintained over time. Thus, each month, exchange rates of the local currency against the US Dollar, as well as updated local, disaggregated CPI series, are used to approximate changes in the relativities of the cost of living at the duty station with New York. Since both local inflation and currency exchange rates have an impact on the updating of the index, their movements may reinforce, but also offset, each other. However, since some index components, notably the pension contribution, the medical insurance and the out-of-area, do not depend on local conditions, changes for these components are less frequent and are accounted for by appropriate indicators derived from other non-local sources of information. The established updating mechanisms are so sensitive to evolving economic circumstances that very often new PAI benchmark results derived exclusively from the survey process are very close to the PAI resulting from the updating mechanisms.

Although the index is updated on a monthly basis, not all of its updates translate into monetary changes of the post adjustment. Derived from the PAI is the post adjustment multiplier, which represents a number of percentage points of the common base salary. The multiplier also called the post adjustment classification (PAC), changes according to operational rules that add administrative considerations and objectives, chiefly the stability of net remuneration, to the index. Only a pure measurement of an increase in the cost-of-living, either through a survey or established updating mechanisms, may trigger a change in remuneration. For Group I duty stations, the PAC is adjusted every month to account for exchange-rate movements in order to keep the amount of salary in local currency within a reference band. Furthermore, it is adjusted once a year to possibly increase salaries, and to reset the reference band, by compensating for local inflation and increases in cost-of-living accountable to other non-local components. Group II duty stations, generically referred to as field duty

stations, have their PACs updated every four months, to account for exchange-rate movements, local inflation, and other indicators referring to the non-local components. Another set of rules, designed to protect net salaries against abrupt and significant changes to local inflation and exchange rates, becomes applicable, whenever necessary, until the economic conditions permit the measurement of the cost of living by the appropriate indicators.

### **Concluding remarks**

The PAS and its methodology are subject to a continuous review and are subject to change in accordance with a 5-year cycle of survey rounds. In the most recent past, solutions were found to difficult problems, such as that of rapidly changing specifications and quality of electronic and high-technology items, which now are treated according to the real-time price-comparison approach. However, several other problems emerged in various areas, from data collection and processing. For example, the comparability of items and outlets, the detection and treatment of outlier prices in a situation where sometimes only too few price quotations are available.

As with the methodology underlying cost-of-living, the application of the PAI in the formulation of the salary-setting policy of the UN is subject to the normal trade-off between precision of the index and stability of remuneration. While the ICSC understands the implications of these two opposing factors, and provide statistical support and clarifications about them, the decision regarding the optimal balancing between the two is non-statistical in nature and ultimately rests with the UN General Assembly.

The ICSC engages in cooperative relationships with other agencies involved in cost-of-living measurement for remuneration of expatriate officials. For instance, Eurostat and the Inter-Organisations Study Section on Salaries and Prices of the OECD (IOS), operate similar systems for their officials. Differences in the overall compensation packages as well as target constituencies, dictate necessary differences in methodologies. However, there is certainly fertile and established ground for cooperation among these institutions, especially in the area of exchange of statistical information (statistical data and methodology, etc.). Under an ongoing memorandum of understanding with Eurostat and IOS, ICSC uses European Comparisons Programme price data for validation, whereas Eurostat uses ICSC price data for their Extra-EU duty stations. Furthermore, IOS produces the rent data used by the ICSC in the calculation of rent indices for Group I duty stations under preferential financial arrangements. All three agencies cooperate in methodological work and harmonization of survey instruments. The International Comparison Programme, managed by the World Bank, also shares several aspects of methodological similarity and might offer further possibilities for data exchange and positive cross-fertilization of ideas and methodologies in the future.

The work of ICSC in estimating differentials of cost of living for international officials is primarily addressed to the constituent organizations of the UN system. However, there is a plethora of other institutions, including the diplomatic services of several countries, that use ICSC indices for their own compensation purposes. In some cases, these institutions have adopted wholesale the UN salary structure and cost-of-living adjustment system. In other cases they have customized the PAS to their needs. It is especially for this second group that we advocate the use of our Retail Price Indices (RPIs), another mechanism for cost-of-living comparisons based on ICSC data. The RPIs are calculated on the

basis of the same raw data used to compute the PAIs, but in a slightly different fashion: while the PAI compares the duty stations to New York at a fixed point in time, the RPI compares the duty stations to New York at the same point in time. Moreover, RPIs may be customized in terms of components, weights and base city for cost-of-living comparisons. They are published bi-monthly by ICSC with an Excel tool that enables users to customize the system of weights used to aggregate the major components of the index according to their needs and circumstances. The dissemination of the PAIs and of the RPIs is public and for free through ICSC's web site <http://icsc.un.org/>. Of course, only aggregated data is disseminated by ICSC, while individual price and expenditure data collected from cost-of-living surveys are protected by confidentiality rules in accordance with the fundamental principles of official statistics.

While the PAS is regularly reviewed and its methodology adjusted in response to changes in the realities of the international community, thoughts must be addressed also to long-term strategic issues that have the potential of introducing radical changes in current operating procedures. One such issue is a wider application of web-based surveys. As a matter of fact, in its most recent cost-of-living surveys at headquarters duty stations (duty stations hosting headquarters of at least one UN organization), the use of well-designed web-based surveys boosted staff participation in its surveys, traditionally very low in large headquarters duty stations, to new record levels of response rates ranging from about 50% to 90%, yielding approximately ten times as much useable data as obtained from the last surveys five years ago. Another strategic issue is achieving a much higher integration with the methodologies for the adjustment of salaries of other international institutions. Work on this aspect is underway with Eurostat.

## REFERENCES

ILO/IMF/OECD/UNECE/Eurostat/The World Bank. *Consumer price index manual: Theory and practice*, Geneva, International Labour Office, 2004.

International Civil Service Commission. *The Post Adjustment System - What it is, how it works*. New York, ICSC, 2011. <http://icsc.un.org/resources/pdfs/pabooklet.pdf>

## ABSTRACT

*The paper presents an overview of the methodology and procedures for creating the post adjustment index, which is designed to equalize the purchasing power of the remuneration of officials of the United Nations system, serving around the world, in countries with widely varying economic conditions, target population sizes and compositions; and levels of development. The major components of the index, and procedures for measuring them, are described, including the use of surveys of expenditures administered to expatriate officials, and of prices of a representative basket of goods and services. Procedures for updating the index over time, taking into account inflation and exchange-rate fluctuations, are also presented. Problems encountered in constructing the index, and proposed solutions, are also discussed, including adjustments for changes in quality over time.*

**KEYWORDS:** cost-of-living index, consumer price index, expenditure surveys, price surveys