LIBRARY REFERENCE USPS-LR-J-122
BEFORE-RATES FIXED-WEIGHT PRICE INDICES

Category Two Library Reference
(Tolley, USPS-T-7)

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I. Introduction

This documentation describes the spreadsheets used in the development of fixed-weight price indices (FWIs) used in witness Thress's econometric investigations as well as in my mail-volume forecasts. The before-rates fixed-weight index spreadsheet, PRICES_BR.XLS, has been filed with this library reference.

II. General Overview

Fixed-weight price indices are conceptually simple, although the actual calculations are complicated due to the complexity of historical postal rates and billing determinants. The logic and layout is similar for all of the fixed-weight price indices constructed here.

The FWI spreadsheet consists of seven sheets: FirstClass, Per, Std, Parcel, Pckg, SpcSvc, and Summary. The first six of these calculate and present fixed-weight price indices for First-Class, Periodical, Standard, parcel post, other package services, and special services, respectively. The last of these sheets presents summary results.

Each of the first six sheets of PRICES_BR.XLS can be divided into four tables (designated I through IV for ease of exposition) as shown in Figure 1.
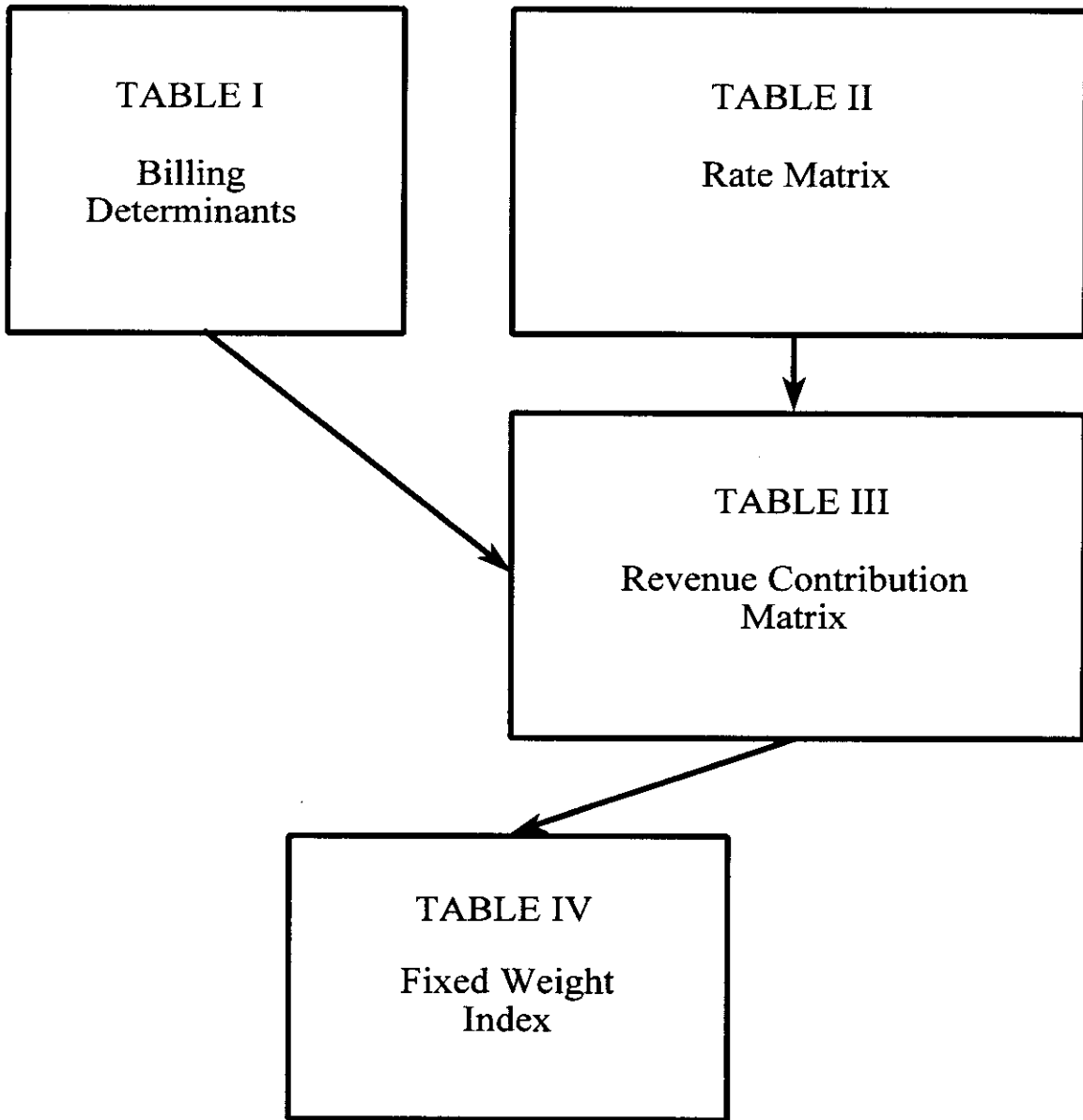
Each of the four Tables in Figure 1 represents a fundamental component of the calculations to derive the FWIs for each category of mail.

Table I contains the presentation of Billing Determinant volumes. Wherever possible, billing determinants for Government Fiscal Year 2000 (GFY 2000) are used in the construction of the before-rates fixed-weight price indices. In some cases, however,

earlier billing determinants are needed. For example, FWIs for First-Class and Standard mail prior to classification reform (MC95-1 and MC96-2) are calculated using billing determinants from the first three quarters of 1996, prior to the implementation of classification reform. For those rate elements which did not exist in GFY 2000, either because they were introduced in 2001 or because they are being proposed as new in this case, billing determinant data consistent with the GFY 2000 billing determinants was included. This data was provided to me by the appropriate pricing witnesses as needed.

Table II contains the Rate Matrix which includes a comprehensive history of rates. Each column or vector of this matrix contains a set of rates that were in effect for a period of time. Each element of the Rate Matrix corresponds to a Fixed-Weight Billing Determinant volume developed in Table I. The first row of data in Table II contains the milestones (YY.Q) corresponding to the Postal Quarter at which a rate change occurred. For example, 66.1 implies that in the Postal Quarter No. 1 of 1966 a rate change occurred.

FIGURE 1
LAYOUT OF FWI SPREADSHEETS

TABLE I	TABLE II
Billing Determinants	Rate Matrix

TABLE III

Revenue Contribution Matrix

TABLE IV

Fixed Weight Index

The second row in Table II is the Proportion of the Quarter at the Old Rate, which indicates the proportion of the Postal Quarter for which the previous set of rates was in effect. The Proportion of the Quarter at the Old Rate is calculated by treating weekdays as whole days, Saturdays as half-days, and disregarding Sundays (so that each week has a total of 5.5 days). The number of days in the quarter, calculated in this way, for which old rates were in effect is then divided by the total number of such days in the Postal Quarter. For Postal Quarters one, two and three, the total number of days in the quarter is 66 (5.5 times 12 weeks). For Postal Quarter four, the total number of days is 88 (5.5 times 16 weeks).

The next section of the Rate Matrix are several rows which contain the cost to send a unit of mail of the specification of the rate element. These numbers are positive numbers, and add to Total Revenue. In some cases, elements of the Rate Matrix may be entered as negative numbers. These denote Postal Service discounts and detract from Total Revenue. The Rate elements are derived from the Rate History reports of the United States Postal Service.

Table III is the Revenue Contribution Matrix. This matrix is computed by taking the cross product of the Billing Determinant volume vector in Table I with the Rate Matrix in Table II. At the bottom of Table III the Total Revenue for each period is summed.

Table IV presents the calculation of the FWI, which is constructed as a Revenue Per Piece for each set of rates. Revenue Per Piece is calculated for each time period by dividing the Total Revenue by the total Billing Determinant volumes to arrive at the average cost per unit of mail. In some cases, a Revenue Adjustment Factor is

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multiplied by the calculated Revenue Per Piece to reconcile this revenue to the amount listed in the Postal Service's RPW report (Rates, Pieces and Weights, USPS).

A brief overview of each individual sheet of PRICES_BR.XLS is presented below.

III. FirstClass

Fixed-weight price indices for First-Class Mail are constructed on sheet FirstClass. First-Class FWIs are constructed using two sets of billing determinants. FWIs prior to classification reform (MC95-1, which was implemented on July 1, 1996) are constructed using billing determinants from the first three quarters of 1996. These are found in column B, rows 6 through 88. FWIs since classification reform are constructed using GFY 2000 billing determinants. These are found in column C, rows 6 through 88.

Rates (i.e., Table II in Figure 1 above) are found in columns E through X at rows 6 through 88. Table III in Figure 1 is in columns E through X at rows 93 through 175.

Fixed-weight price indices (FWIs) are calculated in columns E through X at rows 180 through 206. Worksharing discounts are calculated in columns E through X at rows 209 through 231.

IV. Per

Fixed-weight price indices for Periodical Mail are constructed on sheet Per. Periodical FWIs are constructed using two sets of billing determinants. FWIs prior to R97-1 (implemented on January 7, 1999) are constructed billing determinants from Government Fiscal Year 1998. These are found in column B, rows 7 through 301.

FWIs since R97-1 are constructed using GFY 2000 billing determinants. These are found in column C, rows 7 through 301.

Table II in Figure 1 above (Rates) are found in columns E through AU at rows 7 through 301. Table III in Figure 1 is in columns E through AU at rows 306 through 600.

Fixed-weight price indices (FWIs) are calculated in columns E through AU at rows 605 through 608.

V. Std

Fixed-weight price indices for Standard Mail are constructed on sheet Std. Standard FWIs are constructed using two sets of billing determinants. FWIs prior to classification reform (MC95-1 in the case of Regular and ECR, which was implemented on July 1, 1996; MC96-2 in the case of Nonprofit and Nonprofit ECR, which was implemented on October 1, 1996) are constructed using billing determinants from the first three quarters of 1996. These are found in column B, rows 10 through 330. FWIs since classification reform are constructed using GFY 2000 billing determinants. These are found in column C, rows 10 through 330.

Table II from Figure 1 is found in columns E through AY at rows 10 through 330. Table III in Figure 1 is in columns E through AY at rows 339 through 659.

Fixed-weight price indices (FWIs) are calculated in columns E through AY at rows 664 through 713.

VI. Parcel

Fixed-weight price indices for parcel post are constructed on sheet Parcel. Table 1 from Figure 1 is found in columns B and C, rows 7 - 579 (Inter-BMC), 582 - 1151 (intra-BMC), 1154 - 1866 (Destination Entry), 1869 - 2428 (total parcel post used to

construct the Priority Mail cross price), 2430 - 2996 (total parcel post used to construct the UPS cross price). Table II in Figure 1 is found in columns E through AM of these same rows. Because of the size of this sheet, Table III from Figure 1 is not explicitly presented here.

Fixed-weight price indices (FWIs) are calculated in columns E through AM at rows 3000 through 3013.

VII. Pckgs

Fixed-weight price indices for bound printed matter, Media Mail, and library rate mail are constructed on sheet Pckgs. The billing determinants (Table I from Figure 1) used to construct these FWIs are found in columns B and C, rows 8 through 222. For bound printed matter and library rate mail, GFY 1998 billing determinants are used prior to R97-1 and GFY 2000 billing determinants are used since R97-1. In the case of Media mail, GFY 2000 billing determinants are used throughout.

Rates (i.e., Table II in Figure 1 above) are found in columns E through AN at rows 8 through 212. Table III in Figure 1 is in columns E through AN at rows 227 through 431.

Fixed-weight price indices (FWIs) are calculated in columns E through AN at rows 435 through 443.

VIII. SpecSvc

Fixed-weight price indices for registered mail, insurance, certified mail, COD, return receipts, money orders, and delivery confirmation are constructed on sheet SpecSvc. The billing determinants (Table I from Figure 1) used to construct these FWIs are found in columns B through D, rows 9 through 207.

Rates (i.e., Table II in Figure 1 above) are found in columns E through T at rows 9 through 207. Table III in Figure 1 is in columns E through T at rows 215 through 404.

Fixed-weight price indices (FWIs) are calculated in columns E through T at rows 409 through 415.

IX. Summary

The results are summarized on sheet Summary. This sheet contains four sets of data. First, the price variables, as they are entered into my volume forecasting spreadsheet are presented, followed by the discounts, also as they are entered into my volume forecasting spreadsheet. Following this are the price variables used by witness Thress in his econometric work by Postal quarter. Finally, the discounts used by witness Thress in his econometric work are presented by Postal quarter.