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Positive and negative aspects result from linking postage rates to an index like the service component of the Consumer Price Index (CPI). Several situations were forecast for the price of a first-class stamp between 1977 and 1984, using projections of change in the CPI. Findings/Conclusions: Assuming declining mail volume, forecasts show that by 1984, if postage rates were tied to the CPI, the price of a first-class stamp would be 20 cents; the Postal Service operating deficit for that year would be \$4.7 billion and the cumulative operating deficit would be \$25 billion. Using the CPI service index, the stamp would be 22 cents, the operating deficit \$4.1 billion, and the cumulative deficit \$22.5 billion. Assuming increasing mail volume, the price of a first-class stamp would be 20 cents in 1984, but the cumulative deficit would be \$19.9 billion if linked to the CPI and \$17.9 if linked to the CPI service component. On the positive side, indexing would enhance public understanding of rate increases, allow businessmen to accurately forecast future postage expenses, and simplify the ratemaking process. On the negative side, indexing might increase the amount of the Federal subsidy to the Postal Service and reduce the desire to minimize unpopular rate increases. (RRS)



*STUDY BY THE STAFF
OF THE
U.S. GENERAL ACCOUNTING OFFICE*

Pros And Cons Of Linking
Postage Rates To The
Consumer Price Index

On March 31, 1976, we testified before the Subcommittee on Postal Service, House Committee on Post Office and Civil Service on the feasibility of linking postage rates to the Consumer Price Index (CPI). At that time, we stated that we were studying such a possibility and presented the preliminary details. This paper presents the results of the study.

Our study discusses the positive and negative aspects of linking postage rates to an index. Its greatest appeal is in making increases more understandable and therefore more acceptable to the public. However, the accumulation of large deficits which would have to be offset by appropriations would likely result.

The Postal Reorganization Act Amendments of 1976 established a Commission to study postal problems and recommend long-term solutions. One subject area specified for the Commission's consideration is a study of the desirability and feasibility of a system in which changes in postage rates shall not exceed changes in consumer prices. We believe our study will be useful to the Commission in its consideration of the matter.

We emphasize that the forecasts in our study are based on the assumptions discussed on page 7 and represent what might happen rather than what will happen.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Victor L. Lowe", written in a cursive style.

Victor L. Lowe
Director

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CHAPTER 1

SUMMARY

Indexing has been advanced as a reasonable method of establishing fair and equitable postage rates. Proponents of the concept see it as a way of evaluating Postal Service performance as well as determining that portion of the Postal Service's expenses which should be funded by general tax revenues (the so-called public service payment).

Conceptually, indexing works as follows. At certain intervals, postage rates would be increased to reflect increases in some selected price index. In those instances where revenues, even after adjustments for higher prices as shown by the price index, fell short of Postal Service needs, the Congress, faced with a postal deficit, would have tradeoffs between raising rates above the level indicated by the index, appropriating tax funds, or cutting some aspect of postal operations.

On the positive side, indexing might

- enhance public understanding of rate increases,
- allow businessmen to better forecast future postage expenses--an important matter to major mailers, and
- expedite and simplify the ratemaking process.

On the negative side, indexing might

- increase significantly the amount of the Federal subsidy;
- lighten the burden of the mail user at the expense of the taxpayer, in effect subsidizing the former; and
- remove one of postal management's major incentives to hold down costs--the desire to minimize the number and amount of unpopular rate increases.

We forecasted several situations for the price of a first-class stamp for the period 1977 through 1984 ^{1/} using projections of changes in the Consumer Price Index (CPI) and the CPI-service index. Because of the uncertainty of future mail volume, we made our forecasts assuming (1) declining mail volume and (2) rising mail volume. As shown in the following examples, the cumulative deficits resulting from indexed rates under either alternative would be substantial.

Assuming mail volume declines through 1984, our forecasts show that by 1984, if postage rates were tied to the CPI, the price of a first-class stamp would be 20 cents with an operating deficit for that year of \$4.7 billion and a cumulative operating deficit from 1977 through 1984 of \$25.0 billion. (See app. I.) Using the CPI-service index, the stamp would be 22 cents, the operating deficit \$4.1 billion, and the cumulative deficit \$22.6 billion. (See app. III.)

Assuming increasing mail volume, the price of a first-class stamp would remain the same as in the first example, but the cumulative deficit would be \$19.9 billion if linked with the CPI (see app. II) and \$17.9 billion if linked with the CPI-service index. (See app. IV.)

Tying postage rate increases to an index has its greatest appeal in making increases understandable and therefore more acceptable to the public. Indexing, on the other hand, does not appear to solve the problem of coping with the deficits which result if publicly acceptable rate increases do not allow the Service to recover its costs.

^{1/} Under the Postal Reorganization Act (39 U.S.C. 101), the Congress hoped that the Postal Service would become self-sustaining in 1984.

CHAPTER 2

PROBLEMS WITH SELECTING AND IMPLEMENTING AN INDEX

Indexing postal rates is simple in concept, somewhat complex in implementation. The major areas of concern are

- selecting a suitable index,
- selecting a base year, and
- forecasting index changes.

SELECTING AN INDEX

The major problem associated with selecting an index involves determining the goals or objectives that are to be achieved by introducing the index procedure. These objectives might be either to (1) pass most Postal Service cost increases through to customers while providing a measure of management efficiency or (2) make expected postal rate increases more understandable and therefore more acceptable to the general public.

Automatic pass-through of cost increases

An index that would meet the objectives of passing through most cost increases while providing an effective management evaluation tool would prove hard, if not impossible, to obtain. We believe such an index would have to be based on costs incurred by industries which

- provide a similar type service,
- have a similar distribution system,
- use about the same mixture of factors of production (land, labor, and capital), and
- have approximately the same opportunities for increasing productivity.

Our examination of existing indexes disclosed that none of the more popular or better known indexes met these criteria. While it might be feasible to construct an index that would be useful in passing cost increases through to customers or to reflect changes in the mix and costs of the factors of production used by the Postal Service, there are major reasons why such an index would be inappropriate for

evaluating management's performance. For example, to the extent that management was precluded by law or custom from actions other similar industries were taking to reduce costs, such as closing unprofitable locations or making changes in their distribution systems, it would appear that Postal Service management was not being effective. However, it might well be that management was very effective in the areas it could control but the costs of the other areas were greater; thus, the indexing system would not provide a method to identify the components of any cost differences it might identify.

Making rate increases more acceptable

Selecting an index to make postage rate increases more understandable and therefore more acceptable to the customer might be an easier task. For example, increases in postage rates might be considered acceptable by customers if they rose no faster than the

- general price level,
- prices of consumer goods and services, or
- prices of consumer services only.

The indexes which could be used to measure changes in these prices are discussed below. None of the indexes discussed accurately reflect either the nature of the postal service provided or the variety of consumers of this service.

Index for general price level increases

Increases in the general price level could be estimated using the gross national product implicit price deflator. This price deflator attempts to measure the overall rate of inflation for the U.S. economy and is based on measures of the gross national product (GNP). The GNP represents the total national output of goods and services at current market prices. National output is measured as the sum of expenditures for: (1) personal consumption expenditures, (2) gross private domestic investment, (3) net export of goods and services, and (4) government purchases of goods and services.

Index for prices of consumer goods and services

The usual measure of increases in the prices of consumer goods and services is the Consumer Price Index (CPI). The CPI attempts to measure the average change in prices of goods and services purchased by urban wage-earners and clerical workers.

The CPI is based on a series of samples. Items are included in the CPI on the basis of a survey of consumer expenditures; weights are assigned to represent the relative importance of the various items to the consumer. The CPI is currently based on consumer expenditure surveys made during the period 1960-61. A revised CPI based on surveys begun in 1972 will be published beginning in 1977.

Index for prices of consumer services

An index that could be used to measure price increases in the service sector of the economy is the service component of the CPI. The service component of the CPI is developed in the same manner as the overall CPI. The services for which price changes are obtained include home maintenance, housekeeping, apparel, transportation, health, personal care, and recreation.

DETERMINING A BASE YEAR

Determination of the base year to use in indexing postage rates presents a problem. The decision is to some degree dependent on the relationships that exist between the rates charged for various classes of mail. For example, if first-class rates in the base year were higher relative to other classes of mail, that is if first-class users were paying for a disproportionate share of costs, then this inequity would be incorporated, through the indexing process, into future postage rates.

A second, but related, problem in the base year selection involves its impact on the computed postage rate. For example, as shown in the Annual Report of the Postmaster General for 1973-74, using a base year of 1932, if postage rates had increased in line with the Consumer Price Index, the first-class rate in 1974 would have been about 11 cents rather than the 10 cents in effect at that time. However, an examination of the information presented in the report shows that most of the growth in postage rates occurred in a period that began in 1958. Since then, postage rates have increased faster than the CPI and this has remained true since the Postmaster General's report was published. The effect of base year selection can best be demonstrated by the following example.

<u>Base year</u>	<u>Base year postage rate</u>	<u>Index</u>	<u>Postage rate in 1984</u>
1971	\$.08	CPI	\$.177
1974	.10	CPI	.182
1976	.13	CPI	.203

As shown, even though the same basic index is used, a change in base year can mean a difference of as much as 2.6 cents by 1984. The difference is due to the fact that postage rates rose faster than the CPI between 1971 and 1976.

FORECASTING INDEX CHANGES

The nature of an indexed rate is that it tends to lag behind the costs incurred. For example, if the rates were changed at the end of each year, they would fail to recover the increases actually incurred during the year. As a result, revenues for a given year would not fully cover the costs incurred. Since it would be impractical to make frequent changes in the postage rates, say monthly, to bring them into line with cost increases, some method such as forecasting CPI changes might have to be used to equate the desired level of revenue with the costs of Postal Service operations. Adjustments would probably have to be made from time to time for prior miscalculations.

EFFECTS OF INDEXING

To illustrate the effects of indexing postage rates, we projected postal operating revenues, postal expense, and the price of a first-class stamp for the period 1977 through 1984 under each of the following circumstances

--postage rates tied to CPI starting in 1976 and

--postage rates tied to CPI-services starting in 1976.

We used the CPI in our estimates because it has been suggested in proposed legislation, is widely used as an indicator of the rate of inflation, and because it is used as an escalator for periodic cost-of-living adjustments in labor contracts including the one between the Postal Service and its employees.

The service component of the CPI was used to show the sensitivity of future postage rates to the selection of the index chosen to control them. The CPI will show the effects on the price of postal services when a relatively slowly increasing index is used, and the services component of the CPI will show the effects on postage rates of a faster moving index.

Our forecasts 1/ do not represent certainties, but possibilities. In view of the assumptions made, the forecasts set forth what the situation might be rather than what it will be.

The projections were developed using equations which predict postal expenses and operating income. These equations, along with an equation to predict postal volume, are based on historical data and were derived using regression analysis. (See app. V.)

The major assumptions we have made in forecasting rates are:

- No major changes in the level of services provided by the Postal Service.
- Postal productivity will increase by .7 percent per year, the average annual historical increase for 1960-70.
- Nonlabor postal expenses will increase at rates equal to the gross national product implicit price deflator.
- Future labor contract agreements will lead to increases in postal labor costs at rates equal to the Index of Hourly Earnings of Production Workers.
- Increases in the CPI will vary from about 7 percent in 1976 to 5 percent in 1984.
- There would be no major breakthrough in mail-processing technology.

Using this approach we made forecasts of volume and then using volume along with other factors, we made forecasts of expenses and revenues for the period of 1977 to 1984. We found that both postal expenses and operating revenues depend on postal mail volume. In turn, our research shows that mail volume is influenced by postage rates. The result is that as the real cost of postal services increases, the volume of mail decreases, other things remaining constant.

1/Because data used to develop our regression equations are based on a July-June fiscal year, our projections also assume a July-June fiscal year.

We projected volume increases from 93 billion pieces of mail in 1977 to over 100 billion in 1984. At the time of our study, January 1976, Postal Service estimates of mail volume were considerably below ours. The Postal Service projected mail volume to be about 87 billion pieces in FY 1977 and to remain in the mid to low 80's through FY 1981. The Postal Service subsequently revised their estimates for fiscal years 1977 and 1978 to show an increasing mail volume. Due to the impact of volume on revenue and expense estimates, and the magnitude of the differences between GAO and Postal Service volume figures at the time of our study, we made projections for the 1977-1984 period using both declining and increasing volume estimates. The declining estimates were more in line with those projected by the Postal Service while the increasing estimates were developed by GAO. (See apps. I through IV.)

POSTAGE RATES ESCALATED USING CONSUMER PRICE INDEXASSUMING DECLINING MAIL VOLUME1977 THROUGH 1984(CURRENT DOLLARS UNLESS OTHERWISE SPECIFIED)

<u>Year</u>	<u>Estimated price of 1st-class stamp 1/</u>	<u>Estimated pieces of mail all classes</u>	<u>Estimated operating revenues</u>	<u>Estimated expenses</u>	<u>Estimated operating deficit</u>
----- (billions) -----					
1977	\$0.14	86.9	\$11.7	\$13.2	\$1.5
1978	.15	87.2	12.5	14.3	1.8
1979	.16	85.9	13.0	15.6	2.6
1980	.16	84.3	13.5	16.5	3.0
1981	.17	84.5	14.3	17.7	3.4
1982	.18	84.7	15.2	19.0	3.8
1983	.19	84.9	16.1	20.3	4.2
1984	.20	85.1	16.9	21.6	<u>4.7</u>
Cumulative operating deficit \$					<u>25.0</u>

1/The estimated price of the first-class stamp is rounded

The statements on page 7 of this report are an integral part of this appendix.

POSTAGE RATES ESCALATED USING CONSUMER PRICE INDEXASSUMING INCREASING MAIL VOLUME1977 THROUGH 1984(CURRENT DOLLARS UNLESS OTHERWISE SPECIFIED)

<u>Year</u>	<u>Estimated price of 1st-class stamp 1/</u>	<u>Estimated pieces of mail all classes</u>	<u>Estimated operating revenues</u>	<u>Estimated expenses</u>	<u>Estimated operating deficit</u>
----- (billions) -----					
1977	\$0.14	93.0	\$12.4	\$13.7	\$1.3
1978	.15	93.7	13.4	14.9	1.5
1979	.16	95.3	14.4	16.4	2.0
1980	.16	97.6	15.4	17.8	2.4
1981	.17	99.1	16.6	19.3	2.7
1982	.18	99.5	17.7	20.7	3.0
1983	.19	100.7	18.9	22.2	3.3
1984	.20	102.4	20.1	23.8	<u>3.7</u>
Cumulative operating deficit					\$ <u>19.9</u> -----

1/The estimated price of the first-class stamp is rounded.

The statements on page 7 of this report are an integral part of this appendix.

POSTAGE RATES ESCALATED USING CONSUMER PRICE INDEX SERVICESASSUMING DECLINING MAIL VOLUME1977 THROUGH 1984(CURRENT DOLLARS UNLESS OTHERWISE SPECIFIED)

<u>Year</u>	<u>Estimated price of 1st-class stamp 1/</u>	<u>Estimated pieces of mail all classes</u>	<u>Estimated operating revenues</u>	<u>Estimated expenses</u>	<u>Estimated operating deficit</u>
----- (billions) -----					
1977	\$0.14	86.9	\$11.7	\$13.2	\$1.5
1978	.15	87.2	12.6	14.3	1.7
1979	.16	85.9	13.2	15.6	2.4
1980	.17	84.3	13.7	16.5	2.8
1981	.18	84.5	14.6	17.7	3.1
1982	.20	84.7	15.7	19.0	3.3
1983	.21	84.9	16.6	20.3	3.7
1984	.22	85.1	17.5	21.6	<u>4.1</u>
Cumulative operating deficit					<u>\$22.6</u>

1/The estimated price of the first-class stamp is rounded.

The statements on page 7 of this report are an integral part of this appendix.

POSTAGE RATES ESCALATED USING CONSUMER PRICE INDEX-SERVICESASSUMING INCREASING MAIL VOLUME1977 THROUGH 1984(CURRENT DOLLARS UNLESS OTHERWISE SPECIFIED)

<u>Year</u>	<u>Estimated price of first-class stamp 1/</u>	<u>Estimated pieces of mail all classes</u>	<u>Estimated operating revenues</u>	<u>Estimated expenses</u>	<u>Estimated operating deficit</u>
------(billions)-----					
1977	\$0.14	93.0	\$12.4	\$13.7	\$1.3
1978	.15	93.6	13.4	14.9	1.5
1979	.16	95.1	14.5	16.4	1.9
1980	.17	97.3	15.6	17.8	2.2
1981	.18	98.7	16.9	19.3	2.4
1982	.20	99.1	18.1	20.7	2.6
1983	.21	100.2	19.3	22.2	2.9
1984	.22	101.8	20.6	23.7	<u>3.1</u>
Cumulative operating deficit					<u>\$17.9</u> ----

1/The estimated price of the first-class stamp is rounded.

The statements on page 7 of this report are an integral part of this appendix.

METHODOLOGY USED IN PROJECTIONS

The projections made in this study are based on equations developed to predict postal expenses and postal operating income. These equations, along with an equation to predict mail volume, are based on historical data and were derived using regression analysis. Regression analysis is a method of determining the influences of independent variables (e.g., disposable personal income) on a dependent variable (e.g., mail volume). Using the regression technique, the forecaster seeks to discover those variables which have the greatest impact on the dependent variable. Hopefully, the independent variable can be more easily forecast than the dependent variable. Then given the known or forecast values of the independent variables, the forecaster uses the equation determined by the regression analysis to forecast the variable of interest. We developed equations to forecast volume and then, using volume along with other independent variables, we forecast cost and revenue. 1/

ESTIMATING VOLUME

$$\begin{aligned} \text{VOL} = & -138158.15 + 36.92519 \text{ DPI} + 5108.3461 \text{ FAMIND} - \\ & \quad \quad \quad 2 \\ & \quad \quad \quad 33.49868 \text{ FAMIND}^2 - 0.55980 \text{ P} \\ & \quad \quad \quad 2 \\ \text{R} = & .99839 \end{aligned}$$

WHERE:

VOL = Million of pieces of mail, all classes.

DPI = Disposable personal income of billions of 1975 constant dollars using the gross national product (GNP) implicit price deflator.

FAMIND = Number of families and unrelated individuals in millions.

P = Cost of a first-class stamp multiplied by 100,000 (in 1975 constant dollars using GNP price deflator) lagged one year.

1/ For further discussion of the variables selected for these equations, see our report "Forecast of Postal Service Self-Sufficiency Potential" (GGD-75-58, Feb. 20, 1975).

Projections of disposable personal income 1/ for 1977 through 1984 were obtained from Data Resources, Incorporated (DRI).

Projections of the number of families and individuals 2/ for 1980 and 1985 were obtained from the Bureau of the Census. We then interpolated the data for the interim years and substituted these values into the equation.

Projections of the price of a first-class stamp were computed as follows:

$$o \text{ Current \$ Price} = (\text{current \$ Price in 1976}) \times (\text{Escalating Index (1976 = 1.0)})$$

$$o \text{ 1975 Constant \$ Price} = \frac{\text{Current \$ Price}}{\frac{\text{GNP Implicit Price Deflator}}{\text{(1975 = 1.00)}}}$$

Estimates of the CPI, CPI-services component, and GNP price deflator for 1977-1984 were obtained from DRI.

The volume estimates resulting from the GAO volume equation are higher than those of the Postal Service. To show the sensitivity of postal operating revenue and expenses to mail volume, we also made projections based on volume estimates more in line with the lower Postal Service volume estimate through fiscal year 1981. Estimates for 1982-1984 were derived by assuming volume would change at the same rate as projected for the 1980-1981 period.

1/ Personal income less taxes on individuals, including income and other taxes not deductible as business expenses, and other general government revenues from individuals as individuals.

2/ The term "family" refers to a group of two or more persons related by blood, marriage, or adoption and residing together. The term "individuals" refers to persons 14 years old and over, other than inmates of institutions, who are not living with any relatives.

ESTIMATING EXPENSES

$$\text{Log EXP} = 7.1521 + .5326 \log \text{VOL} - 1.1213 \log \text{PROD} \\ + .02558 \text{ ECON}$$

$$R^2 = .82561$$

WHERE:

EXP = Postal Service expenses in millions of 1975 constant dollars using General Government (Federal) price deflator.

VOL = Millions of pieces of mail, all classes.

PROD = Productivity measured in pieces of mail per man-year.

ECON = Dummy variable inserted to correct for unusual economic conditions in 1974 and 1975.

Projections of the 1977-1984 values for the independent variables were obtained as described below:

- o Volume -- See page 13.
- o Productivity -- assumed to increase at .7 percent per year from 1976 to 1984, the average annual historical increase for 1960-70.
- o Economy -- assumed good economic conditions would prevail during the period (i.e., ECON = 0).

Substituting the appropriate values for the independent variables into the equation yields estimates of expenses in future years given the cost of resources remain at the 1975 level.

Actual (current dollar) expenses in future years were estimated by escalating the expense figures yielded by the equation based on estimate of increases in the cost of resources over the 1975 levels. Fifteen percent of the expenses were assumed to be non-labor expenses. Non-labor expenses were escalated using projections of the GNP implicit price deflator.

Labor expenses (85 percent of total expenses) were escalated based on estimates of the impact of the current labor contract. Because of the difficulties involved in estimating the impact of the cost-of-living provisions of

the current labor contract on future labor costs, we incorporated into our study, portions of a Postal Service estimate of these costs, based on an 8-percent increase in the CPI. As a result, our estimates of expenses are higher than they would have been if we could have factored in the lower CPI estimates developed by DRI. Future contracts were assumed to result in increases equal to increases in the Index of Hourly Earnings of Production Workers.

ESTIMATING REVENUES

$$\begin{aligned} \text{INC} &= -3691.89 + .3559P + .11204 \text{ VOL} \\ &\quad \quad \quad 2 \\ R &= .99214 \end{aligned}$$

WHERE:

INC = Postal Service operating income in millions of 1975 constant dollars using GNP implicit price deflator

P = Cost of a first-class stamp multiplied by 100,000 (in 1975 constant dollars using GNP implicit price deflator) lagged one year

VOL = Millions of pieces of mail, all classes

Estimates of 1977-1984 prices and volumes used to compute constant dollar operating income are explained in the section on estimating volume (see p. 13).

To obtain current dollar estimates of operating revenue constant dollar estimates were inflated based on DRI estimates of the GNP implicit price deflator 1977-1984.