

**COMMISSION
APPROVED**

Comments of
The Bureau of Economics,
The Bureau of Consumer Protection,
and The Bureau of Competition of
The Federal Trade Commission

Submitted in PRC Docket No. SS 86-1
Preferred-Rate Mail Study

April 20, 1986

These comments represent the views of the Bureaus of Economics, Consumer Protection, and Competition and do not necessarily represent the views of the Federal Trade Commission or any individual Commissioner. The Commission has, however, authorized the staff to submit these comments. Inquiries regarding these comments should be directed to Richard Higgins, Bureau of Economics, Federal Trade Commission, Washington, DC, 20580

I. INTRODUCTION

The Bureau of Economics, Bureau of Consumer Protection, and Bureau of Competition of the Federal Trade Commission (FTC) offer comments in response to the Postal Rate Commission's (PRC) request of March 10, 1986.¹ The FTC's responsibility for the enforcement of the antitrust laws and its consumer protection mission give it expertise in matters relating to the competition and consumer welfare effects of governmental policies. Accordingly, the FTC has intervened in recent years in a number of matters before the PRC,² and FTC officials have commented on a number of postal issues.³ As in these earlier contributions, our present comments are limited to those areas in which FTC experience with competitive, consumer welfare, and economic issues in other markets offer a useful perspective for the Postal Rate Commission.

Congress will use the PRC study to determine policy regarding preferential rates. Ultimately, Congress must decide whether some mailers

¹ Based on the authority inherent in Section 6 of the Federal Trade Commission Act, the FTC is authorized to intervene in agency proceedings on matters within its expertise, A & B Freight Lines, Inc. v. FTC, 1980-1 Trade Cas. P63,127, (D.D.C., 1980), aff'd, No. 80-1264 (D.C. Cir. January 26, 1981), cert. denied, 452 U.S. 962 (1981).

² See, e.g., Comments of The Bureau of Economics, The Bureau of Consumer Protection, and The Bureau of Competition of The Federal Trade Commission Submitted in PRC Docket No. RM82-3, Rate and Classification Proposals; Test Period Rule, November 4, 1982.

³ Statement of James C. Miller, III, Chairman, Federal Trade Commission, On United States Postal Service, Before The Subcommittee on Economic Goals and Intergovernmental Policy of the Joint Economic Committee, June 21, 1982. Testimony of Timothy J. Muris, Director, Bureau of Consumer Protection, on "The Provision of Telecommunications and Information Services by the Federal Government in Competition with the Private Sector," before the Government Information and Individual Rights Subcommittee of the Committee on Government Operations, U.S. House of Representatives, February 25, 1982.

should receive preferential rates. If subsidies to preferred mailers are to be reduced, how should this be done? In particular, should subsidies be reduced across the board or should some preferences be eliminated entirely?

The comments presented here will discuss some of the factors bearing on the costs and benefits of the current preferential rate structure. Specifically, we will point out some of the hidden costs which result from the preferential treatment which is currently given to some mailers. While the final assessment of costs and benefits is of course for Congress to make, it is important that Congress be aware of all the costs that are actually involved.

Our analysis indicates that the current pricing policy for preferred mail leads to the inefficient allocation of resources. Because subsidized prices are below true economic costs, preferred mailers are encouraged to use subsidized mail services excessively. In particular, preferred mailers will use subsidized mail when other forms of message delivery would be more cost-effective. They will inefficiently shift to subsidized mail services from the unsubsidized mail services they otherwise would have used. They will stop performing some activities, such as maintaining accurate mailing lists, since access to subsidized rates reduces the private return to these activities. Finally, they will undertake activities which allow them to exploit their access to subsidized mail, even when they are less efficient at performing these activities than others who do not have access to preferred rates.

The remainder of our comments are organized as follows. First, we estimate the social losses which result from the excessive use of subsidized mail by preferred mailers. Second, we discuss particular examples of the

types of distortions which lead to the estimated social losses. We conclude with a summary of our findings and recommendations.

II. SOCIAL LOSSES DUE TO SUBSIDIZATION OF PREFERRED MAILERS

Efficient production and allocation of goods and services requires that the value of the last unit produced be equal to the social cost of producing it.⁴ As a result, economists often evaluate the efficiency of markets by determining whether prices are equal to marginal costs.⁵ Using this test, the subsidization of postal rates will clearly be inefficient if the prices charged preferred mailers are set below marginal costs.

The prices charged subsidized mailers appear to be below marginal costs. Currently, subsidized mailers pay a price which is set slightly above attributable costs.⁶ Studies of economies of scale suggest that almost all postal costs are variable, and thus should be attributed if prices are to equal

⁴ If marginal social benefits are less (greater) than marginal social costs, net social benefits would increase with less (greater) production. For a more detailed discussion of the conditions which are necessary for efficient allocation of resources see, Douglas F. Greer, Business, Government, and Society (New York: Macmillan, 1983), pages 14-37.

⁵ This argument assumes that the marginal social benefit of the good or service equals the benefit to the consumers who make the purchase. In the case of preferred mail, it could be argued that the marginal social value of the additional mail is greater than the marginal value to the individuals or organizations who pay for it. If Congressional assessment of the social value of providing preferred mail services is greater than is indicated by the private demand for preferred mail, then our estimates of social loss should be reduced.

⁶ Attributable costs are costs which, in the judgment of regulators, are "caused" by a particular type of mail. Other costs, which are common or joint costs, are referred to as institutional costs.

long-run marginal costs.⁷ However, only 70% of all costs are currently attributed, indicating that preferred prices are likely to be below marginal costs.⁸

When economies of scale are low, marginal cost pricing implies that almost all costs will be covered by the revenues earned from mailers. Currently, only regular mailers are charged prices which cover total costs. This suggests that regular second and third-class prices may be set close to marginal costs.⁹ In the following analysis we assume that this is true.¹⁰ By making this assumption, one can estimate the extent to which the prices

⁷ For example, see the discussion in James Miller and Roger Sherman, "Has the 1970 Act Been Fair to Mailers?" in Roger Sherman (ed.) Perspectives on Postal Service Issues (Washington, D.C.: American Enterprise Institute, 1980).

⁸ Some costs which are currently viewed as institutional costs appear to vary with volume, confirming the findings of the economies of scale studies. For example, increases in mail volume would increase the amount of equipment in use, and would thus require proportional increases in equipment maintenance, yet in the 1984 Recommended Decision the Postal Rate Commission classified only 6.1% of equipment maintenance as attributable costs. United States of America Postal Rate Commission, Appendices to Opinion and Recommended Decision, Docket No. R84-1, (Washington, D.C.: Postal Rate Commission, 1984). Similarly, only 48.6% of window service labor costs were viewed as attributable, but surely if mail volume were to double the Postal Service would find it necessary to nearly double the number of clerks to provide comparable service. Similarly, the rate-making process appears to attribute too little of supervisor, technician, and postmaster salaries.

Of course, the problem of calculating attributable costs arises because postal rates are regulated and entry is largely prohibited. If free entry were allowed and competition were to arise, prices would be set by the market to align with costs, avoiding the need to make the allocations discussed in the text.

⁹ The extent to which this is true will depend on how the costs which postal regulators currently classify as institutional are allocated in determining the prices of different classes of regular mail.

¹⁰ While this assumption appears to be sensible, given available information, additional work to measure marginal costs and economies of scale in postal markets test would be desirable.

charged preferred mailers are below marginal costs and estimate the social losses which result from this subsidization.

The social losses which result from the disparity between prices and marginal costs are estimated using standard economic analysis in the Appendix to this comment. The loss measure is based upon the following reasoning. When the amount of mail sent increases, the value of each additional unit declines. For example, the first and second solicitations sent to any individual in a given year are more likely to generate contributions than the third and fourth solicitations. The value of each unit of mail can be measured by how much the mailer is willing to pay to send it. When the mail is subsidized, preferred mailers are induced to send additional mail that they would not have been willing to pay for at the regular price. We assume that the price of unsubsidized mail is set at the marginal cost to the Postal Service of handling the mail. Hence the value of the additional preferred mail sent as a result of the subsidy is less than its cost, resulting in a social loss. By summing the losses which result from the sale of each of the additional units, one can obtain a measure of the social loss which results from the subsidy. It is the value obtained by performing this summation which we report as the social loss which results from the postal subsidy.

The subsidy payments which go to preferred mailers have historically been near \$1 billion.¹¹ These payments do not directly reflect social losses.

¹¹ Congress paid the Postal Service \$969.6 million in 1985 to compensate it for the delivery of preferred mail. Of this, \$140.5 million was payment for subsidized attributable costs which has been phased out. The 1986 subsidy was originally estimated to be near \$981 million. U.S. Government Accounting Office, Report to the Honorable William Dannemeyer, House of Representatives: Subsidized Postage, (May 22, 1985). (Hereinafter cited as Subsidized Postage.) Recent budget cuts have reduced the subsidy

They are simply a large transfer from taxpayers to people who use subsidized mail. As explained above, social losses result from the effect of the subsidy in stimulating excessive use of the mails by preferred mailers. In the Appendix we estimate, using measures of the elasticity of demand obtained from PRC rate hearings, that this increase in mail usage is currently over 1.5 billion pieces of second and third-class mail per year, which is slightly over 10% of current preferred second and third-class mail.

Under the assumptions detailed in the Appendix, we estimate the annual social loss at current prices to be approximately \$20 million dollars for third-class mail alone.¹² While the loss from subsidizing second-class mail appears to be smaller, largely due to the more inelastic demand and smaller volume of mail, it does increase the total estimated loss to about \$30 million, using the same set of assumptions.¹³

The social losses which we attribute to the current subsidy are sizeable. However, the annual rate of losses prior to the March 9, 1986 rate increase, which brought the prices charged preferred mailers closer to the Postal Service's costs of serving these customers, were substantially larger. We estimate that before the recent rate increase, the social loss due to

so that it is closer to \$700 million.

¹² The assumptions used in the calculation include: the assumption that demand is linear, the assumption that marginal costs are constant, the assumption that the price of regular mail is set at true marginal costs, the assumption that the demand for preferred mail reflects the social value of the mail, the assumption that there are no secondary effects as a result of the subsidy, and the assumption that prices equal marginal costs in other markets.

¹³ Fourth-class mail and free mail for the blind are also subsidized. We do not estimate the social losses which result from this subsidization, since the smaller volume of these types of mail suggests that the losses which will result are likely to be smaller than the loss which results from the subsidization of second-class mail.

excessive use of second and third-class preferred mail was just over \$50 million, of which \$35 million is attributed to the subsidization of third-class mail. Thus, we estimate that the recent rate adjustments have reduced social losses by over \$20 million.

The rate increase for preferred mail which took place in January is estimated to have had an even larger effect. The annual social loss due to subsidization before this rate increase is estimated to have exceeded \$105 million. Roughly seventy-five percent of this loss results from the third-class mail subsidy.

The Appendix identifies some important relationships which affect the size of the estimated social loss due to subsidization of mail services. First, it is clear that the size of the subsidy is crucial, since the social loss goes up more than proportionally with increases in the price-cost distortion resulting from the subsidy. Second, the elasticity of demand which is used is important. The more elastic the demand, the larger the social loss that will result from the subsidy. Third, the presence of distortions in related markets affects the size of the estimated social loss. For example, if the subsidization of preferred mail reduces demand for other types of mail for which the price exceeds marginal costs then, additional social losses will result from subsidization.

III. EXAMPLES OF DISTORTIONS WHICH RESULT FROM SUBSIDIZATION

The social losses which result from subsidization of preferred mailers are the result of several specific market distortions. One distortion that will contribute to the social wastes which we estimate occurs when preferred mailers substitute subsidized mail services for other more cost-effective

forms of message delivery. For example private carriers appear to be particularly effective competitors for heavier third-class single piece mail.¹⁴ To the extent that subsidized mail leads preferred mailers to switch from methods of delivery that are more efficient than the subsidized postal service, social losses will result.

Subsidies also provide preferred mailers with an incentive to shift from unsubsidized mail services to subsidized mail services, even when the social costs of the change in behavior exceed the associated benefits.¹⁵ Numerous

¹⁴ In R80-1 at page 400 the PRC recognizes that direct competition from private carriers is present. Others have also recognized the presence of direct competition. Sorkin reports examples of magazines and newspapers switching to private carriers to deliver sizeable portions of their circulation. Alan Sorkin, The Economics of the Postal System, (Lexington, Mass.: Lexington Books, 1980) And the presence of UPS, motor carriers, consolidated shipping associations, and express delivery firms offer direct competition in the fourth-class parcel post market.

¹⁵ For example, the in-county subsidy may have had this effect on national publishers before recent changes made them ineligible for the subsidy. Until recently, national publishers could designate a large county, such as Los Angeles, as their "county of publication" and receive a sizeable subsidy on all of the second-class mail they sent to residents of the county. This structure of the subsidy encourages them to ship their publications to the county for entry into the postal system in that county, even though this involves handling the mail twice. Assuming that the in-county subsidy does more than reflect the lower costs of handling mail which is destined for residents of the county in which it is mailed, this double handling implies that unnecessary social costs may be present.

A study done by the General Accounting Office identified six national publishers which designated Los Angeles as their office of publication. Originally, four of these six indicated that their office of publication was outside this area. The subsidy to the six national newspapers amounted to \$3.6 million. The total in-county subsidy from the federal government amounted to around \$72 million in 1985. Subsidized Postage.

By putting stricter eligibility requirements on the in-county subsidy, Congress reduced significantly the distortions that arise from this subsidy. Moreover, the recent changes cause the subsidy to be targeted better so that a lower percentage of the funds go to unintended parties. Nonetheless, the in-county subsidy is still worth more in large counties. As a result, the subsidy still may go primarily to large populous counties which are more likely to have adequate news/information networks than smaller rural areas.

possibilities for substitution among different types of mail exist. For example, both letters and post cards can be used to convey personal messages. Organizations that wish to contact the public may use first-class letters or post cards, third-class single piece mail, and third-class bulk mail. The extent to which inefficient shifting across types of mail occurs can be measured by the cross-elasticities of demand between different postal services.¹⁶ While these cross-elasticities are fairly low, they indicate that inefficient shifting across types of mail does take place.

Since subsidized mail users pay less for mail services, they have less incentive to undertake certain activities which will reduce Postal Service costs. For example, subsidized mailers will have less incentive to maintain accurate mailing lists, since the costs they incur for misdirected mail will be

¹⁶ Economists use the "cross-elasticity of demand" as a statistic which indicates the extent to which products are substitutes. This statistic is an estimate of the percentage change in the quantity demanded of one commodity which results from the percentage change in the price of another commodity at the prevailing prices. If the value of the cross-elasticity is greater than zero the products are substitutes. Larger values indicate greater degrees of substitutability of the products. The table shown below reports cross-elasticities which have been estimated:

Cross-Elasticity Estimates (percentage change in quantity of one type of mail/percentage change in price of second type mail)	by Tolley	by Sobin
letters/post cards	.01	.01
postcards/letters	.28	.12
letters/3rd class bulk regular	.03	.04
3rd class bulk regular/letters	.18	.25
post cards/3rd class bulk regular	---	.20
3rd class bulk regular/post cards	---	.03

Testimony of George Tolley in R80-1 USPS, vol. 21, appendix H.
 Testimony of Bernard Sobin in R77-1, Changes in Rates of Postage Fees, vol. IV, pp. 559-561.

lower.¹⁷ This possibility was recognized by the Postal Service when it noted: "Fund raisers seldom purge or crosscheck their mailing lists, causing households to receive the same solicitation three or four times, because it is cheaper for the mailer to send duplicates than to clean his lists."¹⁸

Subsidized mailers are also less likely to consider ways in which mailings can be combined, since the cost of sending an additional piece of mail is lower for them. In this case, as in the case of out-of-date mailing lists, the postal service incurs real costs because it must handle a larger volume of mail.

Mail subsidies also lead to social losses by encouraging subsidized mailers, such as non-profit organizations, to enter markets where they can exploit their access to lower postal rates even if they are inefficient producers of relevant product. Moreover, the sizeable artificial advantage granted to non-profit organizations will lead to non-profits replacing possibly more efficient for-profit firms.¹⁹ Specifically, the reduced postal rates granted to non-profit firms lowers their marginal cost of selling their products, and thereby induces them to expand their sales and encourages entry by more non-profit firms. The increased supply by non-profit firms

¹⁷ The General Accounting Office attempted to study this question by sampling preferred mail, but stopped when it discovered that it was a more sizeable task than had been envisioned at the outset. See Subsidized Postage.

¹⁸ U.S. Postal Service, The Necessity For Change, February 1976, page 38.

¹⁹ The entry of non-profit organizations in response to profits that are attributable to subsidies has been observed with respect to other types of subsidy. For example, Professor Henry Hansman observed that non-profit organizations represent a higher percentage of the organizations in the private nursing home, hospital, and primary, secondary, and vocational school industries in states with higher state and local taxes than in other states. "The Effect of Tax Exemption and Other Factors on Competition Between Nonprofit and For-Profit Enterprise" (preliminary draft, December 1982).

results in a decrease in the output of for-profit firms. The non-profit firms that enter in response to the subsidy will tend to be those firms that were too inefficient to compete without the subsidy, whereas the for-profit firms that are forced to exit are sufficiently efficient to compete in the market under equal conditions. Thus, the net effect of the differential pricing is that high cost producers replace low cost producers, increasing the total resources necessary to produce any given amount of output.

Current postal regulations allow non-profit firms to use their reduced rates even when the services they are offering are in direct competition with for-profit organizations or when they are working cooperatively with a for-profit firm. The only requirement is that the use to which the non-profit mail permit is put must directly benefit the non-profit organization.²⁰ When any of the more than 780,000 non-profit organizations use subsidies to compete in activities in which for-profit firms are more efficient, social losses will result since final output is not produced efficiently.²¹

While the postal subsidy is only a small part of the total subsidy which flows to non-profit organizations,²² it may nonetheless be large enough to

²⁰ There is some evidence that organizations do not use their mail permits as they were intended to be used. The General Accounting Office reports that of "180 authorizations (for use of nonprofit mail rates) selected for reverification, 93 of 146 reviewed to date were revoked because they no longer qualify for nonprofit mailing privileges." Subsidized Postage, Appendix I, p.5.

²¹ Over 300,000 non-profit organizations file IRS form 990s. However, smaller non-profit organizations do not have to file these forms. As a result, the total number of non-profit organizations is estimated to exceed 780,000.

²² The total income of non-profit organizations was \$314.4 billion, while the postal subsidy was less than one billion. As a result, the postal subsidy is less than .3% of the funding that goes to non-profits. Small Business Administration, "Statistical Profile of the Nonprofit Sector,"

give non-profit organizations an important edge when they compete with for-profit firms in some industries. Moreover, the use of the mails by non-profit organizations in selling products and services to raise funds appears to be on the rise. While available figures are not entirely satisfactory, they suggest that "sales" are becoming an increasingly important source of income for non-profit organizations. Indeed, they surpassed \$200 billion in 1980.²³

Case studies indicate that non-profit organizations use their mail subsidies to compete with for-profit organizations in some industries where mail is an important input.²⁴ Specifically, the travel, insurance, magazine, and seminar industries often rely on the mails to reach customers, which can advantage non-profit organizations relative to for-profit organizations. For example, Dominick Schrello points out in his study of the seminar industry that: "Presently. . . (the) significant postal rate discount gives nonprofit organizations a tremendous advantage compared to others in the public seminar market place."²⁵ Evidently, large seminar organizers send over 60

Advocacy Current Topics, April 1985.

²³ Sales figures not only include the sale of goods and services by the non-profit organization, but the sale of assets which may have been obtained through gifts or the investment of dues. Nonetheless, the change in sales levels relative to other flows of funds suggests that the provision of goods and services by non-profit organizations is on the rise. In 1975, sales accounted for 65% of all funds flowing into non-profit organizations. By 1983, this figure rose to 76%. Small Business Administration, Advocacy Current Topics.

²⁴ For a more detailed discussion of cases cited in the text, see Subsidized Postage.

²⁵ Cited in Subsidized Postage, page 5.

million pieces per year, which means that access to subsidized rates has been worth millions of dollars.²⁶

In another example, one association saved \$705,000 over the course of a year for an insurance company with which it was associated by mailing information about insurance policies to its members.²⁷ There also appears to be direct competition between for-profit and non-profit magazines.²⁸ Statements provided the PRC by officials representing for-profit travel agencies and other businesses as part of these hearings suggest that the value of the subsidies in the industry are similarly large.²⁹

In sum, the replacement of for-profit producers by subsidized mailers has the potential of generating large social losses. Our estimates of the social losses resulting from subsidization include these losses. Private losses which result as subsidized mailers edge out regular mailers are only reflected in these calculations to the extent that the private losses exceed private gains, which go primarily to subsidized mailers. This approach is appropriate since our purpose is to measure the net social welfare effects of

²⁶ The General Accounting Office estimated that in 1984 the subsidy was worth \$3.5 million if 60 million pieces were mailed. Subsidized Postage, page 6.

²⁷ The Postal Service initially felt that the association was formed as a sham and revoked its license. However, it reversed its decision when it appeared that a court would hold for the association. Subsidized Postage, page 8.

²⁸ Magazines such as National Geographic, Harpers, Ms., Smithsonian, and Science 86 are preferred mailers. In contrast, Atlantic, Working Woman, and Scientific American are not.

²⁹ See for example: Written statement provided by Howard Pollock, American Society of Travel Agents, Inc., March 10, 1986; Statement by Kenton Pattie, International Communication Industries Association, March 12, 1986; Statement of Joseph O'Neil, Business Coalition For Fair Competition, March 12, 1986.

the subsidy. Moreover, it correctly leaves the job of articulating the significance of private losses which result from subsidization to the affected parties and the problem of weighing the significance of these arguments to Congress.³⁰

IV. CONCLUSION

The use of postal subsidies has both benefits and costs. Some benefits and costs fall into areas of public policy that are beyond our expertise, so we leave their assessment to others. A number of costs resulting from the subsidies, however, involve the kinds of economic inefficiencies with which we have become familiar. We are taking this opportunity to review some of these costs and to urge that they be taken fully into consideration in any ultimate assessment of costs and benefits.

The subsidization of preferred classes of mail leads preferred mailers to use subsidized mail excessively. This inefficient increase in mail use results from a number of distortions. Users of the U.S. Postal Service are led to substitute inefficiently one form of mail service for another. They are encouraged to use the mail to convey messages that would be more efficiently conveyed in alternative ways. They are prompted to rely on the Postal Service to perform tasks which would have been avoided if the subsidy had not been present. And they are encouraged to participate in businesses that allow them to exploit their access to subsidized postal rates even when they are not efficient producers. Each of these effects reduce social welfare.

³⁰ Similarly, we do not discuss here the private losses to competitors of the Postal Service who are disadvantaged by the subsidy given to the Postal Service for handling preferred mail.

While much of our analysis points to general concerns, some specific conclusions and recommendations follow from this analysis:

--The inefficiencies which result from lowering the prices of subsidized mail below marginal costs are not trivial. Estimates provided in the Appendix suggest that annual losses are roughly \$30 million dollars and may have exceeded \$50 million dollars before the recent rate increase.

--Substantial portions of the non-profit subsidy seem particularly inefficient and Congress should consider reducing them. For example, non-profit organizations appear to be using their subsidy to enter into competition with for-profit firms. To the extent non-profit organizations are better suited for providing other services, this behavior will lead to inefficiencies.

--Rate structures should be reviewed and amended where necessary to give preferred rate mailers incentives to use the postal system efficiently.

--The current means of measuring "attributable" costs deserves more attention, since it appears to lead to an understatement of the subsidies received by preferred mailers.

Accurate assessment of the magnitude of all of the losses that result from the inefficiencies discussed above is not possible with the data we have at our disposal. However, there is reason to believe that there are sizeable losses. Clearly, additional analysis of the Postal Service's cost structure and its implications is needed. While this is beyond the scope of the current PRC project, we believe that this project does highlight the importance of allowing the PRC and interested outside parties to have access to costs, prices, and related data which is required to evaluate the efficiency of the U.S. Postal Service.

Appendix: Deadweight Loss Calculation

The subsidization of a particular type of mail can affect the welfare of individuals in two ways. First, there will be a transfer between the people who fund the subsidy and the users of the subsidized mail services. Currently, the transfer is almost \$1 billion. Second, there may be a social loss, often termed a "deadweight loss," which results because society's limited resources are incorrectly used to produce the subsidized service. This loss results when the social cost of the resources used in producing the subsidized service exceeds the social value of the service. It is equal to the difference in the value of the output which is produced by the misdirected resources and the value of the output which would have been produced if the resources had been employed correctly.

Here we estimate one component of the deadweight loss attributable to the preferred rates granted to certain types of second and third class mail. Specifically, we focus on the distortion caused in the second and third class mail markets because subsidized prices are depressed below the costs of delivering postal services. We ignore social costs that result because of expenditures by the government to oversee the subsidization effort and by private individuals who incur costs in their effort to qualify for subsidized rates. We also ignore the increase in social losses in other markets which may occur when prices already exceed social costs in these markets.

Our analysis employs a number of simplifying assumptions to make the analysis possible. For expositional simplicity these assumptions are phrased in terms of third-class mail only; the same assumptions are made for second-class mail as well. These assumptions are:

1. The current prices for non-preferred third-class mail are set at the marginal cost of providing these postal services.
2. The demand for third class-mail by preferred classes reflects the social value of their use of the mail.
3. The demand curve of preferred mailers for third-class mail is approximately linear in the region between the regular price and the price for preferred mailers.
4. The marginal cost curve for providing third-class mail to preferred mailers is approximately linear and flat in the region between the quantities demanded at the regular price and the price for preferred mailers.
5. There are no other distortions in the economy which cause the prices of other goods to diverge from their social costs.
6. There are no secondary effects due to the interaction of various types of mail.

Under the six assumptions, the deadweight loss due to the subsidization

of second or third class mail can be approximated using the following formula:¹

$$\text{Loss} = [(dP)(dQ)]/2$$

In this formula dP is the reduction in price granted to preferred classes of mailers and dQ is the increase in the quantity of second or third class postal services that results from the reduction in price.

Annual deadweight losses due to subsidization will be estimated for three different levels of subsidization which were present during the last twelve months. Before January 1986, preferred mail prices were set below attributable costs.² In January, these prices were raised so that revenues covered expected attributable costs.³ On March 9, 1986, preferred mail prices were raised above attributable cost levels, although preferred mail rates are still below regular mail rates.⁴

Deadweight Loss Due To Subsidization Of Third-Class Mail

To apply the loss formula to estimate the deadweight loss that results from the subsidization of certain types of third-class mail, we must know the change in price and change in quantity that will result when the price charged preferred third-class mailers is reduced from the "regular" price to the "preferred" price. Using estimates of the elasticity of demand for third-class preferred mail (e) and sales of third-class mail (q) at subsidized prices (p), it is possible to estimate sales (q^*) at the regular prices (p^*).⁵ This calculation relies on the definition of the elasticity of demand. Because the elasticity of demand (e) equals $(dQ/dP)(p/q)$, dQ equals $(q-q^*)$, and dP equals $(p-p^*)$, it is true that q^* equals $-(q)/\{(e)(dP/p)-1\}$. Once we know q^* , we can calculate the change in quantity (dQ) which is associated with the change in price (dP).

¹ This formula is derived in F.M. Scherer, Industrial Market Structure and Economic Performance, First Edition, (Chicago: Rand McNally, 1970):400-404.

² Prices were set at "Step 14" levels. The price, quantity, and elasticity of demand for this period will be given by p , q , and e .

³ These prices are known as Step 16 prices. The price, quantity, and elasticity for this period will be identified by p^{***} , q^{***} , and e^{***} .

⁴ Variables associated with regular rates are indicated by a single *. Current rates are indicated by two **s.

⁵ Along a linear demand curve, the elasticity will rise (become more elastic) as price increases from p to p^* . As a result, the elasticity e^* at p^* will not equal the elasticity e at p .

The values we input into this expression were obtained from the Postal Rate Commission. Specifically, the values for p^* , p and q were obtained from a PRC table which reports the revenues and volume of third-class mail during the first quarter of the current fiscal year.⁶ The value of e was derived from the testimony of George Tolley in PRC Docket No. R84-1.⁷

The data used in the analysis are given in the following table:

⁶ This table is entitled "Revenue, Pieces and Weight by Classes of Mail and Special Services for Postal Quarter I of Fiscal Year 1986 (September 28, 1985 - Dec 20, 1985) Compared with the Corresponding Quarter of Fiscal Year 1985" Subsequently, it will be referred to as the First Quarter Revenue Table.

Price per piece was assumed to equal revenue divided by the number of pieces. The resulting prices reflect the subsidized Step 14 rates which were charged before the movement to Step 16 rates in January, 1986.

⁷ Based on pre-1982 data, Tolley estimates that the elasticity of demand for non-profit bulk mail is $-.074$. We adjusted this value upward to $-.2$ when setting the value of e for two reasons: (1) If demand is linear, as is assumed in this analysis, demand will be more elastic at higher price levels. Since prices have increased since Tolley made his estimate, we would expect demand to be more elastic at current prices than it was at the lower prices which prevailed during Tolley's sample period. (2) We believe that Tolley's original estimate is biased downward, since his regression equation does not include a variable to control for the growth of non-profit organizations. Since non-profit organizations have been growing in number while third-class preferred mail prices have been increasing, one would expect that the reduction in non-profit mail volume resulting from the price increases will be offset to some extent by an increase in volume due to the presence of more potential customers. Since Tolley doesn't control for the effect that the growth in the number of non-profit organizations will have on volume, he understates the quantity depressing effect price increases will have, and thus underestimates the elasticity of demand.

We believe our upward adjustment in Tolley's estimate is conservative. Our approach is equivalent to assuming an elasticity of $-.58$ at p^* . Tolley's estimate of the elasticity of demand for nonpreferred mailers at p^* is $-.935$. Thus, our approach produces a much lower elasticity for preferred mailers than would the assumption that the elasticities for the two types of third-class mail are the same at this price. This makes the approach conservative, since the lower the assumed elasticity at p^* the smaller the deadweight loss estimate.

Data For Third-Class
Preferred Mail Loss Calculation

e	-.2
p	\$.05/piece
p*	\$.11/piece
q	11.00 billion pieces
q*	8.36 billion pieces
dP	-.06/piece
dQ	2.64 billion pieces

Substituting the estimates for dP and dQ into the expression for the deadweight loss gives an approximate loss of \$79.2 million for third-class mail. However, this is the deadweight loss that was occurring before both the January and March price increases for preferred mail.

Between January and March, when Step 16 prices were in effect, the subsidy was around \$.04. This caused output to be 1.76 million pieces higher than it would have been at unsubsidized levels.⁸ The associated estimate of the deadweight loss is \$35.2 million.

Currently, the subsidy is nearer \$.03.⁹ This reduction in the subsidy reduces dP to \$.03/piece and dQ to 1.32 billion pieces.¹⁰ The associated deadweight loss falls to \$19.8 million.

⁸ Volume figures given in the First Quarter Revenue Table were used to weight Step 16 prices (as reported in "Statement of Chairman John R. McKean on Preferred Rates of Postage," February 4, 1986--hereafter McKean Statement). The average price we obtained was \$.07. The quantity (q^{***}) and change in quantity ($q^{***}-q^*$) were obtained using the same procedure as was used to obtain q^* and ($q-q^*$).

⁹ The figure of \$.03 was obtained by comparing the weighted minimum prices for third-class non-profit mail given in Schedule 5 of McKean's Statement to the average prices charged regular third-class mailers which were calculated from the PRC First Quarter Revenue and Table using the 1986 figures in that table. The weights which were used in calculating the 1986 third-class preferred price were obtained from the third-class volume figures reported in PRC First Quarter Revenue Table.

¹⁰ The quantity q^{**} and the change in quantity (q^*-q^{**}) due to the current subsidy were derived using the same procedure as was used to obtain q^* and ($q-q^*$).

Deadweight Loss Due To Subsidization Of Some Second-Class Mail

Estimation of the deadweight loss which may result from the subsidization of second-class mail is more difficult, since the pricing of second-class mail is more complicated than third-class mail pricing¹¹ and weighted average prices for the relevant quantities were not available. Nonetheless, we derive an estimate by assuming that the "illustrative" examples of second-class mail suggested in McKean's Statement have the average characteristics of in-county and non-profit mail. Using these characteristics and rate schedules for the three different time periods, it was possible to obtain estimates of p , p^{**} , and p^{***} .¹² An estimate of the current average price for regular mail (p^*) was calculated from the PRC First Quarter Revenue Table.¹³ The prices we obtained in this way align with other PRC figures.¹⁴

The analysis also requires us to estimate the volume of second-class preferred mail (q) which was sent at the subsidized prices which prevailed before January 1986 and the elasticity of demand (e^*) at regular prices. The volume at p was assumed to be 3.5 million pieces a year, which is 35% of

¹¹ Unlike third-class mail, all second-class mail has both a per piece charge and a charge based on the weight of the item. As a result, the average price depends on the characteristics of the newspaper or magazine which is being mailed and will, as a result, vary significantly.

¹² The in-county and non-profit mail were averaged using weights derived from Table 1 in Tolley's testimony in PRC Docket No. R84-1. Specifically, in-county mail was assumed to be 40% of preferred second-class mail before March 9, 1986. Because of changes in eligibility requirements, which now prevent national publishers from using in-county mail, this figure was reduced to 20% after March 9, 1986.

¹³ This calculation assumed that p equaled \$.055, that 35% of second-class mail is preferred mail, and that the average price of mail during the first quarter of the current fiscal year was \$1.06. The \$.055 came, as is explained in the text, from the "illustrative" examples in McKean's Statement. The 35% figure was derived from Table 1 in Tolley's testimony in PRC Docket No. R84-1. And the average price of mail (\$.106) was derived from the PRC First Quarter Rate Table by dividing revenues by total pieces.

¹⁴ For example, using the description of the illustrative example which was used to calculate the non-profit mail rate which is given in the table "Description of Illustrative Preferred Rate Example" and the pricing formula given in Rate Schedule 301 in Appendix One, Opinion and Recommended Decision, Docket No. R84-1, we calculated that the price for similar regular non-profit mail would be \$.13. This suggests a level of subsidization of \$.06, as we initially assumed.

the roughly 10 million pieces of second-class mail which is sent each year.¹⁵ The elasticity e^* was assumed to be $-.40$ at p^* . This aligns roughly with Tolley's estimates used in PRC Docket No. R84-1.¹⁶

With this data, we were able to obtain all of the values we needed to calculate the deadweight loss.¹⁷ The data we used are summarized in the following table:

Data For Second-Class
Preferred Mail Loss Calculation

e^*	$-.40$
p	\$.055/piece
p^*	\$.133/piece
p^{**}	\$.085/piece
p^{***}	\$.074/piece
q	3.50 billion pieces
q^*	2.835 billion pieces

¹⁵ The PRC First Quarter Revenue Table indicates that 2.5 million pieces of second-class mail were sent in the first quarter of 1986, which would produce a yearly volume of 10 million pieces if subsequent quarters were the same. Data from earlier years indicate that preferred second-class mail is roughly 35% of all second-class mail. For example, see Table 1 in Tolley's testimony in PRC Docket No. R84-1.

¹⁶ Tolley estimated that the elasticity of demand for non-profit second-class mail was $-.29$ and the elasticity for in-county second-class mail was $-.395$. These estimates will understate the elasticity at p^* for the reasons discussed in footnote 7. As a result, we rounded off Tolley's higher estimate and used it.

¹⁷ In the calculation of deadweight loss for third-class mail we noted q^* equals $-(q)/\{(e)(dP/p)-1\}$. Since we know e^* and not e , we must derive a different equation to calculate q^* in the case of second-class mail. To do this one again starts with the definition of the elasticity of demand, but one uses the formula for the elasticity at p^* rather than at p . Specifically, one defines e^* as:

$$(dQ/dP)(p^*/q^*)$$

Using this definition, it can be shown that

$$q^* = (q)/\{(dP/p^*)(e^*)-1\}$$

From this equation, it is possible to calculate the value of q^* reported in the table. Given this value of q^* , it is possible to then calculate dQ .

Substituting the values for dP and dQ before the January 1986 price increase into the deadweight loss formula, we obtain an estimated annual deadweight loss of \$25.9 million due to the \$.078 subsidization of second-class mail and an increase in sales of .665 billion pieces. The January price increase which is estimated to have cut dP to \$.059 and dQ to .503 million appears to have reduced the annual deadweight loss to \$14.8 million. The recent March 9, 1986 price increase is estimated to have reduced the annual deadweight loss to \$9.8 million, by reducing dQ to .41 million and dP to \$.048.

Sensitivity Analysis

The results are particularly sensitive to the size of dP . As the empirical examples discussed above indicate, doubling dP leads to more than a doubling in the deadweight loss. Thus, it is important to understand what affects the size of dP .

The dP term reflects the difference between the marginal cost and the marginal benefit of mail services at the quantity demanded by preferred mailers in response to the preferred price. If the marginal cost of providing these services is higher (or lower) than the value given in assumption (1), then the deadweight loss will be higher (or lower). Similarly, if the marginal social value of mail for preferred classes is higher (or lower) than the amount preferred classes are willing to pay at the margin (namely the preferred price), then the deadweight loss will be lower (or higher). For example, if the output of non-profit organizations is considered to be a public good, one might argue that the social value of extra mailing by non-profit firms is greater than they are willing to pay. On the other hand, the willingness of non-profit firms to pay for mail is already increased by the sizeable subsidies granted to non-profit institutions through the tax system, so one might argue that the social value of additional mailings is actually less than their willingness to pay.

The estimate of the deadweight loss is also sensitive to the estimated elasticity of demand of preferred mailers at the unsubsidized price. A larger elasticity would lead to greater estimated losses and a lower elasticity would lead to lower estimated losses, for a given dP . The reason for this is that when demand is elastic (inelastic) the change in output which results from a change in price is larger (smaller), and it is this change in output which leads to the redistribution of resources.