AN INVESTIGATION OF A NEGATIVE INCOME TAX PAYMENTS MECHANISM

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CHAPTER I

INTRODUCTION

In recent years income maintenance as a method of combating poverty has drawn a tremendous quantity of comment, discussion, and debate. One of the most active income maintenance suggestions is the negative income tax. Proponents of this method of transfer-by-taxation include a large number of prominent economists, business leaders and government officials.

A major point made in support of a negative income tax is the simplicity of such a program, chiefly the comparatively simple method of arriving at the amount of subsidy. While it is quite true that this first step can be made very simple it is not clear that certain subsequent steps will be as easy. The problem dealt with in this study concerns the timing of payments--whether or not there will be over- or underpayments, and how they might be handled. This step is often ignored or given only brief mention in the formulation of negative income tax plans.

Definition of the Problem

A payments mechanism must satisfy two mutually exclusive goals. One, the need-payment lag should ideally be reduced

to zero. The need-payment lag is defined as the period of time which elapses between proof of need by an individual or family and receipt of an income maintenance subsidy.

When is need exhibited? To understand this point assume that each day individuals go to a market place and hire out their services for that day. Assume also that the wage is fixed at the subsistence level, and that an income maintenance program exists. If one day an individual goes to the market and cannot sell his services he would be considered in need. That is, he would not expect to earn nor actually earn his subsistence for that day. The time which elapses until he receives an income maintenance subsidy would constitute the need-payment lag. Relaxing the assumptions, need will be considered proven on the day that the individual expects his future income to fall below the minimum income criteria.

Why should the need-payment lag be zero? The need-payment lag must be zero or close to zero in order to preserve the negative income tax program as an income maintenance program. To illustrate assume that the need-payment lag for the stringent example in the previous paragraph is one day. If the individual in question fails in his efforts to be hired on day one he receives no income, but will be entitled to an allowance. This allowance will be paid on day two. If he is not hired on day two the program will have maintained his income for that day. But what if he should work on day two? Can the program which allows him to collect an allowance and earn income equal to the criteria (subsistence) be

called an income maintenance program? As stated before this is a stringent example but it does illustrate the importance of a minimum need-payment lag.

The second goal of a payments mechanism is the elimination of over- and under-payments. Over- and under-payments occur when the amount of the allowance paid to a recipient is not equal to that which should be paid. For reasons analogous to those given above over- and under-payments should be zero. It is income for a given period that is to be maintained. Underpaying an individual prevents the system from accomplishing the objective of operating a proper income maintenance program. Overpayments interfere in the same manner and introduce the possibility of burdensome repayments.

Why was it stated that the two goals were mutually exclusive? To answer this question the cause of over- and under-payments needs to be analyzed. Income maintenance payments are based on income, or better still, the lack of income. If the period income is known with certainty the subsidy payment can be calculated with complete accuracy. This naturally eliminates the existence of over- or under-payments. Logically, as knowledge of the period income becomes less certain the probability and the occurrence of over- and under-payments increases. Certainty decreases when knowledge of income is based on expectations rather than historical data. The longer the length of time from expectation to realization the greater the uncertainty. Hence, when negative tax payments are based on expected future income

there exists the distinct possibility of over- and under-payments.

Earlier it was stated that the exhibition of need would occur on the day the individual felt that his future income would be insufficient. Therefore, reduction of the need-payment lag to zero would infer the incidence of over- and under-payments. On the other hand reducing the over- and under-payments to zero by basing the payment of subsidy on historical income data would preclude the elimination of the need-payment lag.

From the above analysis it becomes evident that a negative income tax timing mechanism cannot attain both of its goals simultaneously. It becomes necessary to find a balance between these two goals which will optimize the system. The purpose of this thesis is to study the matters related to a payments mechanism and to analyze a system which would attempt to present an optimal mix of the two goals.

The previous discussion concerning the need-payment lag in relation to its role in an income maintenance program is extremely important at this time. It would seem that if the negative income tax program is established for the primary goal of maintaining poverty level incomes the first concern should be with the reduction of the need-payment lag. Logic suggests that when income maintenance payments are needed some allowance, be it too small or too large, is better than none at all. And, on the other hand unnecessary payments to individuals and families who cease to qualify for allowances

should be eliminated quickly. Hence, this thesis will first strive to establish a minimum need-payment lag within restraints of economy and efficiency. Once established these lags will serve as constraints on the second phase of the study, the reduction of over- and under-payments.

Specifically it is hypothesized that there is some change in the current tax and transfer system which, under conditions of a minimum need-payment lag, would reduce the incidence and magnitude of over- and under-payments.

Limitations

The timing of payments is not the only problem faced by proponents of negative tax system. Problems concerning the definition of the family unit, the definition of income, the proper tax rate or rates, the necessary minimum incomes, the reduction of the occurrence of work disincentives and the problem of cost and financing all await final action. Most of these problems interact with the problems concerning this thesis. Hence, certain assumptions must be made about them.

The definitions of income and of the family unit are of critical importance to the negative income tax mechanism. Because they are beyond the scope of this thesis these definitions will be assumed to be established. For purposes of this study it is not necessary to define them explicitly. Where possible mention is made of the affect that different definitions would have on the timing problem.

Work incentives will be ignored as the topic is too broad to mention except in passing. Discussion of costs will be limited to using expense as a restraint to prevent the use of procedures which would produce unreasonable costs. Negative income tax rates and guaranteed incomes will be discussed in Chapter II.

Methodology

There is only one active negative income tax program. This program is an experiment operated by the Office for Economic Opportunity through the Council for Grants to Families in New Jersey (hereinafter abbreviated CGF). The program is very new and the timing mechanism is designed for experimental purposes. The main purpose of the experiment is to study work incentives and negative taxes as income maintenance plans and not to study payments mechanisms. Hence, at the present time there is no hard data available for study. Instead the present income support institutions must be drawn upon to supply examples and data. In addition examples of possible negative income tax cases will be studied.

The study related to the need-payment lag will generally be based on current operating procedures and methods of the Social Security Administration (hereinafter abbreviated SSA), the Public Assistance organizations and other income maintenance institutions.

The over- and under-payments situation is to a certain degree quantifiable. At least it is subject to definition in algebraic formulae. Hence, this method will be used to analyze the over- and under-payment problem. Evaluation of the results of the analysis will be conducted through the use of examples.

Specifically Chapter II will review negative tax plans. After certain helpful definitions are established some implications and ideas concerning administration will be discussed. Chapter III will establish the procedural and administrative framework for a proposed timing schema. Chapter IV will analyze the over- and under-payment problem. Chapter V will evaluate and discuss ideas fostered throughout the thesis. Chapter VI will summarize the results, make recommendations and suggest further research.

CHAPTER II

SOME THOUGHTS ON THE TIMING PROBLEM

Before initiating a detailed discussion of the type of payment mechanism that would most effectively optimize the timing goals several questions must be studied. First, because of the multitude of transfer-by-taxation proposals a review of the properties of the type of plan to be studied is in order. Secondly, some thoughts on organization concerning what type of information is needed from the recipient and who should administer the various functions of a negative tax system need to be analyzed. Finally, using the more specific plans as guides, the timing problem should be studied and some of the more obvious misunderstandings should be examined.

Negative Income Tax Proposals

In the relatively short history of negative income tax dialogue there have been numerous proposals brought forward. Witness the work by Professor George H. Hildebrand, Poverty, Income Maintenance, and the Negative Income Tax, which as early as April of 1967 listed nine separate transfer-by-taxation plans.[1] Since time has passed and the discussion of

[1]George H. Hildebrand, Poverty, Income Maintenance, and the Negative Income Tax (Ithaca, New York: Cornell University, 1967), pp. 65-68.

negative taxes has if anything increased there exists a multitude of plans ranging from extremely modest ideas to very large income redistribution schemes. Because of this wealth of literature it would be well to organize and outline the main existing plans and to specify the type of plan which will be considered in this paper.

Similarities

All transfer-by-taxation plans incorporate three basic variables. Professor Christopher Green aptly summarizes them in the following way:

> (1) a guaranteed minimum level of income that varies with family size or family composition or both; (2) a tax rate or rates applied against a tax base; and (3) a breakeven level of income where the tax liability equals the allowance guarantee. Any two of these variables determines the outcome of the third.[2]

Differences among the various plans occur in the choice of values for these variables. These choices can affect the timing problem. For instance, if the proponent of a plan wishes to establish a high minimum income and yet feels the need for a relatively low breakeven point in order to maximize the number of net taxpayers the resulting tax rate must be very high. Such a situation would lead logically to larger over- and under-payments. Conversely if there were a low rate and low breakeven point there would necessarily be a low guaranteed income. This would mean that over- and under-payments

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[2]Christopher Green, Negative Taxes and the Poverty Problem (Washington: The Brookings Institution, 1967), p. 62.

would tend to be absolutely smaller and the timing problem would become relatively less important. But the plan would be less adequate in dealing with the poverty problem.

There are other areas of similarity between various plans. Most plans call for the abolition of the stringent means tests employed by current welfare agencies. Proponents substitute instead income or the lack of it as the only criteria for receipt of payment. Also a marginal tax rate of less than 100% is included to encourage work incentive. In addition to differences in the choice of variables, the plans have other differences which will be dealt with in the next two sections. Discrepancies among the various types of plans will be delineated and in some cases reconciled.

EX-MSD and Poverty Gap Plans

The original negative income tax proposal was presented by Professor Milton Friedman in 1962. Programs similar to transfer-by-taxation plans, however, can be found as early as 1795 when the English used the Speenhamland system for a short time.[3] More recently Lady Juliette Evangeline Rhys-Williams developed the Social Dividend approach to income maintenance. This occurred in 1942.[4] In Friedman's plan the tax unit's exemptions and minimum standard deductions (hereinafter referred to as EX-MSD), as defined by internal revenue laws, are subtracted from gross income leaving adjusted

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[3] Ibid., p. 51.

[4] Ibid., p. 52.

income. If this amount is positive the unit will pay the normal positive tax for their income. If this amount is negative, however, a certain proportion is remitted to the family as a net transfer. The total EX-MSD owing an individual or family is then the breakeven level of income and the proportion of the negative adjusted income remitted is the negative tax rate or rates.[5] The EX-MSD could also be used as the income guarantee. This arrangement would call for a relatively high breakeven level of income.

The poverty gap proposals use as their criteria amounts similar but not identical to EX-MSD. These plans establish guidelines for income. Individuals or families falling short of these guidelines are considered poor. The poverty gap guidelines are then used as breakeven levels or guaranteed incomes.

The guidelines vary depending upon what data are used. A widely accepted authority is the Social Security Administration. Recent statistics published by Mollie Orshansky for the SSA indicate that the guidelines for a non-farm family should be approximately $1650 for an individual or head of household and $550 for each additional family member.[6] When

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[5]Milton Friedman, Capitalism and Freedom (Chicago: Chicago University Press, 1962), pp. 191-195.

[6]These estimates are this writer's own approximations of those published by Mrs. Orshansky. Her estimates are detailed down to the dollar and additional amounts vary with each family member. Such detail was deemed unnecessary for present purposes. Exact estimates can be found in Mollie Orshansky, "The Shape of Poverty in 1966," Social Security Bulletin, 31 (March, 1968), Table 1, p. 4.

comparing these figures with EX-MSD which total $900 for an individual or head of household and $700 for each additional family member the specific differences between the plans become apparent. Except for relatively large families, six or more members, the EX-MSD approach falls short of the poverty criterion. The differences are extremely critical for very small units of one or two members.

It is logical to assume that an initial attempt at transfer-by-taxation would be relatively modest. A fractional plan using EX-MSD or poverty guidelines as breakeven levels is the most likely candidate for an introductory plan. Which plan will be used, if any, depends on Congress. Good arguments can be advanced for both proposals. For analytical purposes, however, a strong case can be made for the use of EX-MSD in this paper. As stated earlier poverty guidelines are not well defined and in fact depend upon what data are used and what individual or group uses the data to arrive at poverty estimates. The EX-MSD on the other hand are defined precisely. Secondly, if a poverty gap plan were used some individuals or small families could simultaneously be subject to income taxes while receiving a subsidy for the lack of income. This phenomenon is caused by the differences between poverty guidelines and EX-MSD. Therefore, for reasons of simplicity only, this paper, except where noted, will use a fractional EX-MSD plan.

Social Dividend and Other Plans

Social Dividend plans were first suggested by Lady Rhys-Williams. Later work was done by Robert Shultz and by D. B. Smith, who actually formulated a complete social dividend type of plan.[7] In general these programs call for the payment of a given sum to every family rich or poor. The plans usually include a separate tax structure which independently finances the scheme. The net effects of such plans are: one, to put a floor on income, usually at a relatively high level; and two, to cause a sizable redistribution of income.

This author feels that the Social Dividend type of plan is far too ambitious to be the initial transfer-by-taxation program. Therefore, in the formulation of a payments mechanism Social Dividend plans will largely be ignored. Suffice it to say that since every individual or family would receive a fixed payment the timing problem would become solely a question of recovery of earned income in relation to the tax structure through some withholding scheme.

Several other plans which cannot be fitted neatly into one of the above mentioned categories have also been suggested. Among these are expanded public assistance and social insurance, and family or childrens' allowances. There are good possibilities that such programs may be enacted. However, to consider them here would excessively broaden the intended scope of this paper as each has its own peculiar

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[7] D. B. Smith, "A Simplified Approach to Social Welfare," Canadian Tax Journal, Vol. 13 (May-June, 1965), p. 260.

and largely undefined timing problems. For instance, Children's allowance proposals vary as to whether they would affect all children or just children in poor families. Should parental income be considered the issue would become more complicated.

Summary

Social dividend, family allowances, and other fringe plans have largely been eliminated from the discussion. An analysis of the EX-MSD type plans and the poverty gap plans have shown similarities and differences. Because of analytic simplicity it was decided to use the EX-MSD approach as a basic plan for study of the timing problem. This does not preclude the use of a poverty gap plan nor would the more general principles set forth in this paper be affected by changes in EX-MSD itself. In fact adjustment of EX-MSD amounts to some poverty guideline may well be an excellent idea.

Administration

Income Declaration

All plans require some form of income declaration. This calls for the individual or family concerned to file, with the appropriate agency, a statement of their past or future estimated earnings. These reports can be of two types--ex ante and ex post. Ex ante statements are an estimate of future income and ex post reports are assertions of past

earnings. No plan could function solely on an ex ante statement. Obviously there would be a complete breakdown in any such scheme, as virtually everyone would claim that they were expecting no income. On the other hand a plan could operate on an ex post statement, but the lag time between the evidence of need and payment of subsidy would necessarily be at least the length of the period covered by the statement. As indicated in Chapter I it is the need-payment lag which must be reduced to a reasonable minimum in order to provide adequate, timely assistance.

Since neither type of statement is truly sufficient on its own, both statements should be used. An ex ante statement in order to secure timely poverty relief and an ex post statement to insure accuracy and efficiency are both necessary under a negative tax scheme oriented to the goals given in Chapter I.

Most writers feel that such statements should be as "simple as possible."[8] This writer agrees entirely with this sentiment. There are, however, two sides to the coin. One can see that the simpler the income declaration is (i.e., the less detail given and the less proof required) the fewer the errors and omissions, and the faster an income maintenance program could operate. At the same time a simple statement would mean that it would be easier to defraud the system. The degree of simplicity attained under reasonable restraints

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[8]Friedman, p. 192; Green, Negative Taxes, p. 112; Hildebrand, Poverty, p. 59.

is dependent more on the definition of income than on the design of a form.

Institutions

The Internal Revenue Service (hereinafter abbreviated IRS) is often tagged with the responsibility of administering a negative income tax with little or no discussion.[9] It is not readily apparent that the IRS is the institution most capable of the efficient transfer of money to the poor. An evaluation of the IRS, the Social Security Administration, the Public Assistance system, and other possible administrators will be helpful in the discussion of a payments mechanism. Particular emphasis will be directed to those procedures employed by the various institutions which could conceivably affect the timing problem.

Internal Revenue Service

Because so many negative income tax proponents off handedly accept the IRS as the administrative agency is insufficient reason to assume it would be the most efficient organization. To be sure the IRS does have several plus factors which must be considered. One argument advanced is that the negative income tax would be an extension of the tax structure, a transfer-by-taxation system, and the IRS administers the tax program. Secondly, a negative income

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[9]Friedman, p. 192; Green, Negative Taxes, p. 110; Ripon Society, Ripon Forum, (April, 1967) as reprinted in U.S., Congress, House, 90th Cong., 1st Sess., May 4, 1967, Congressional Record, H5098-H5102.

tax scheme to aid the poor only would cover about 10.9 million households.[10] While an absolutely large figure, should the IRS handle the system, this would amount to a relatively small increase, approximately eleven per cent, in the number of income returns filed.[11] Thirdly, the IRS has manpower and procedures geared to the enforcement and interpretation of tax laws. This knowledge would be invaluable in a negative tax plan to prevent fraud, and interpret definitions of family unit and income. Finally, and most important, the IRS is the only federal organization with power to tax income at the source. A method of withholding similar to or incorporated into the current system would be beneficial in eliminating the burden of overpayments.

On the other side of the balance sheet liabilities also appear. While as indicated above the increase in income statements would be relatively small this does not take into account the issuance of periodic payments. This point leads to another problem. The IRS is organized, except for refunds, to be a collection not a dispersal agency. A shift of concept while still retaining perspective in both collection and dispersal may well prove to be a difficult task. The IRS is also rather removed from the proximity of poverty. Only

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[10] Orshansky, Table 4, p. 7. This figure is generally related to a fractional poverty gap plan but would be reasonably close, certainly a maximum, for a fractional EX-MSD plan.

[11] William H. Smith, Deputy Commissioner of the Internal Revenue, Speech before National Convention of Former Special Agents of the FBI, Wash. D. C., September 29, 1967.

fifty-eight district offices would be available for use by recipients, who most probably would need more assistance in filing forms than the current tax payers. Intuitively it seems that recipients will be less likely to file revised income statements should their income change if the filing office is relatively inaccessible. This would result directly in an increase in the probability of overpayments. Lastly, the IRS, being the type of agency it must be, may not be able to convey an image of aid and relief to the poverty stricken. IRS employees are not social workers. This situation could lead to a lack of needed personal interaction with the poor.

Public Assistance

Arguments can be advanced for the administration of a negative income tax program by the public assistance organizations. This is based chiefly on the similarity of goals. Public welfare agencies are quite used to dealing with the indigent. Their main goal is maintenance of income for certain categories of the poor. For the most part formal public assistance organization reaches to the county level and into depressed economic areas. In other words the system is structured both to aid and to reach the poor. Finally, unless the highly unlikely possibility that a negative income tax would be very generous and replace all public assistance programs,[12] there would have to be a great degree of coordination

[12]Public assistance would most certainly have to continue. For instance, a couple with no income would receive $1440 a year from Oklahoma Old Age Assistance. Under a

between the two income maintenance structures.[13] In fact, in 1966, 2.9 million households received public assistance payments. Most of these 2.9 million fall into the 10.9 million poor households mentioned earlier.[14] Incorporating the two programs would automatically overlap and coordinate much of the system.

The major argument against incorporating negative income tax into the assistance programs is the lack of uniformity within the public welfare sector. A negative income tax scheme is designed to be national in scope and organization, operating in all states with the same procedures and policies. Public Assistance on the other hand is organized on a state level. While there are similarities and federal guidelines which direct state programs it would be impossible to find two identical state programs. Because of the decentralized nature of the system, the increasing mobility of the poor would create serious problems. Moving from state to state would entail closing records and possible repayment of subsidies in one state coupled with the necessary delay of processing and issuance of payment in the new state. Such movement would cause instability in the flow of payments and

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fifty percent EX-MSD system they would receive only $800 and a poverty gap plan would only increase this amount to $1100. Dale Mitchell, Director of the Division of Research and Statistics, Department of Public Welfare, State of Oklahoma, Private Interview, Oklahoma City, Oklahoma, November 22, 1968.

[13] Green, Negative Taxes, p. 112.

[14] Orshansky, Table 19, p. 28.

would tend to create extensive over- and under-payment problems.

Overpayments themselves constitute another problem. A federal policy released about a year ago is important to this discussion. Mr. Owen B. Ash explained the policy in a letter.

> The policy among other things precluded States from reducing current assistance payments to recipients who had received income in the past and failed to report it unless the income was still available to the recipient (an exception was made if fraud was involved).[15]

In other words overpayments are generally ignored. As a general policy this would not be permitted under a negative tax system. Nonrepayment of certain overpayments should not be ruled out completely. There will be small amounts which would cost more to collect than to ignore. The basis for deciding what overpayments to collect will have to be made from a marginal cost versus marginal revenue analysis. Also there may be some cases where collection of an overpayment would interfere with the major goal of a negative tax system, income maintenance. In these cases it would be best to waive recovery of the overpayment.

Social Security Administration

The Social Security Administration has the definite advantage of being a national organization with some 800 permanent offices. In addition there are 3300 contact stations

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[15]Owen B. Ash, Letter from Mr. Owen B. Ash, Chief, Fiscal Standards Branch, Assistance Payments Administration, Washington, D.C., to Dr. Joseph J. Klos, Professor of Economics, Oklahoma State University, January 22, 1969.

in areas detached from a full time location.[16] While not always to the county level these centers are sufficient in number to be within close proximity of most poor. The administration is chiefly a dispersal agency, issuing approximately 24 million checks a month.[17] The SSA is explicitly cognizant of the fact that they are a major factor in America's current income maintenance program and that the recipients of benefits are dependent upon the prompt receipt of regular monthly checks.[18]

Through the retirement test the SSA does make adjustments in payments due to changes in income. In the same light the administration has procedures to effect reconciliations in over- and under-payments. In fact under certain circumstances overpayments may be repaid over extended periods of time.[19] These same procedures include the requirement that individuals affected by the retirement test complete income statements, both ex ante and ex post. An automatic check is available on the accuracy of the ex post

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[16]U. S. Department of Health, Education, and Welfare, Social Security Administration, Where to Get Help or Information on Social Security, (Washington, D. C.: Government Printing Office, 1968).

[17]"Current Operating Statistics," Social Security Bulletin, (June, 1968), Table M-8, p. 24.

[18]U. S. Department of Health, Education, and Welfare, Social Security Administration, Claims Manual, (Washington, D.C.: Government Printing Office, 1967), sec. 1000.

[19]U. S. Department of Health, Education, and Welfare, Social Security Administration, Social Security Handbook, (Washington, D.C.: Government Printing Office, 1966), sec. 1910.

income reports through the cooperation with the IRS and the SSA computer facilities.[20] These direct parallels of negative income tax administration needs provide strong arguments for Social Security administration of a negative tax program.

The SSA has one major drawback. It is solely a dispersal oriented agency, all collections for the administration being handled by the IRS. The SSA itself has no direct method of taxing income at its source nor do its operations include any other normal type of collection function. Another problem may stem from the insurance concept of current Social Security programs. Whether or not the direct welfare aspects of a negative tax would interfere with this original social insurance concept is not certain.

A New Agency?

Some consideration should be given to the establishment of a new agency, one which could incorporate all of the procedures which would assure an efficient operation. The obvious drawback is in the duplication of efforts in relation to the aforementioned institutions. Any attempt to withhold from the source of income would conflict with and confuse the present IRS system. A high level of coordination and communication would have to be initiated with other income maintenance programs. The one new agency which might be suitable or even desirable would be a nationalized Public Assistance

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[20] U. S. Department of Health, Education, and Welfare, Social Security Administration, Claims Manual, sec. 5101 (e).

program. Such a program has received a flourish of attention in the last few months.[21]

How would the federalization of Public Assistance affect this thesis? This writer feels that such action would not materially alter the conclusions of this paper. The reasons are quite simple. A decentralized plan similar to Governor Rockefeller's would be very similar to the current Public Assistance. The only difference would be in the financing of the program. If the autonomy of the state systems is maintained most methods and procedures related to the payment of subsidy would probably go unaltered. The other alternative is a complete federalization of assistance. This type of program would yield an administrative system resembling that of the Social Security Administration. Hence, national public assistance need not be considered as a separate type of administrative arrangement. Depending on one's own preferences National Public Assistance can be read in for current Public Assistance or SSA when this paper considers procedures and methods related to these institutions.

Summary

From the previous discussion a logical choice would be to allow the IRS to handle the collection of overpayments and policing functions, leaving all other administrative duties

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[21]Nelson A. Rockefeller, Governor of New York, Speech before the Republican Governors' Conference, Palm Springs, Calif., December 6, 1968; Joseph J. Klos, "Public Assistance, Family Allowances, or the Negative Income Tax?," Paper presented to the Rocky Mountain Social Science Association, Denver, Colorado, May 3, 1968, p. 19.

to the SSA. It has been shown that this action would be the most efficient in light of goals. The current channels of communication between the IRS and the SSA are geared to this type of organization. The IRS currently collects all OASDHI contributions and transfers them to the SSA accounts at the Treasury. The addition of negative income tax overpayment collections would not seriously affect this process.[22] For these reasons the rest of this paper will orient itself towards a system administered in this manner. This is not to say that Public Assistance will be ignored. Principles and procedures applied by these institutions may well shed much light on the timing problem, and the necessity of close co-operation between public assistance and the negative income tax program cannot be overstated.

Critique of Specific Proposals

Most negative income tax proposals seldom deal with the administrative details of the plan. However, there are four separate sources who have developed payment mechanisms with some degree of detail. The Ripon Society, a Republican research and policy organization, has issued a detailed negative income tax proposal. The Council for Grants to Families a subsidiary of Mathematica is conducting a negative income tax experiment in New Jersey. Representative William Ryan,

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[22]Arnie Johnson, Staff Assistant to the District Director, Internal Revenue Service, Private Interview, Oklahoma City, Oklahoma, Nov. 28, 1968.

(D. N.Y.), has submitted a bill in congress cited as the "Income Maintenance Act." And, a plan was presented separately by Joseph A. Pechman and James Tobin to the Subcommittee on Fiscal Policy of the Joint Economic Committee in June of 1968.[23] Their ideas stem from an article written by Pechman, Tobin, and Peter M. Mieszkowski in 1967. It is the statements in this article which will be analyzed.[24] An analysis of the timing mechanisms of these plans would be helpful in understanding current thought on methods of payment, and expose some deceptive points in relation to the alleged simplicity of the negative income tax idea.

Ripon Proposal

> 3. Administration
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> One of the fundamental simplicities of the Negative Income tax is the ease with which the program can be administered without establishing an additional welfare bureaucracy. An individual or family which expects its income to fall below the standard in a future period will file for Negative Income Tax payments from the Internal Revenue Service. These payments will be made monthly. At the end of each year, Negative Tax recipients will file returns showing their actual income in the year. Any discrepancy between the actual Negative Tax payments and what a family was entitled to can be made up by a lump sum refund or tax payment, or if the payment is large, by a tax payment spread over several months.
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> To minimize the variation in tax payments [by the] employed, Negative Tax recipients should have

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[23] U.S., Congress, Joint Economic Committee, Income Maintenance Programs, before the subcommittee on Fiscal Policy, 90th Cong., 2nd sess., 1968, pp. 93-103, 244-273.

[24] James Tobin, Joseph A. Pechman, and Peter M. Mieszkowski, "Is a Negative Income Tax Practical?," The Yale Law Journal, 77 (November, 1967), pp. 20-23.

> tax withheld at the source like other employees. Withholding together with assistance in filling out forms and modern data processing, will simplify the administration problems in adjusting tax payments to income.[25]

The preceding is the section of the Ripon proposal pertaining directly to administration and the timing of payments. While not explicitly detailed the statement does show where the more refined thoughts of the authors will lead. The inclusion of monthly payments, ex anti and ex post income declarations, and some use of the withholding tax structure is the logical beginning of a well organized timing schema.

The main area of contention centers on the over- and under-payments mechanism. The Society seems to draw the conclusion that excessive over- and under-payments necessitating relatively large transfers of money will be quantitatively insignificant. At the same time the impression is left that the Rippon Society feels that income changes during the year will also be inconsequential and, therefore, reaction to these changes are ignored. Coupling these two points with the opening statement concerning simplicity leads this writer to believe that simplicity is either assumed or is given too high a priority in the proposal. Intuitively it can be seen that the simpler the timing mechanism the larger and more frequent the occurrence of over- and under-payments. In order to provide adequate and regular assistance in line with the need exhibited by the lack of income it is necessary that

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[25] Congressional Record, p. H5102.

changes in income and procedures to minimize over- and under-payments must be taken into account. To do these things a more complicated schema must be developed.

New Jersey Experiment

The CGF is engaged in an experimental program and has therefore designed its system for controlled statistical study. For this reason recipients must report their income every four weeks, and payments are made on the basis of these ex post statements.[26] Because of the size of the program and the frequency of reporting the use of ex post declarations does not significantly interfere with the need-payment lag. The use of ex post statements eliminates any over- or under-payment problem.

The Ripon report sacrificed accurate, regular, adequate assistance for simplicity of administration. A practicing plan incorporating concepts used by the CGF would sacrifice any semblance of economy of administration for extensive control of proper payments. That is, in order to keep up the pace and narrow the need-payment lag of a CGF type proposal the administering agency would have to be a tremendously large establishment. This analysis holds for the type of scheme involved. This does not imply that the CGF supports such a plan for a practicing negative tax system.

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[26]Heather Ross, "An Experimental Study of the Negative Income Tax," Paper presented at the second annual meeting of the Community Services of Pennsylvania, Harrisburg, Pa., May 19, 1968, p. 4.

The Ryan Bill

Representative Ryan's proposal is not explicitly labeled "negative income tax," but the provisions are characteristic of such a plan. The guaranteed income is equal to two-thirds of the monthly EX-MSD with a ceiling of $284 per family. In other words the program only covers six or less dependents. The negative income tax rate is fifty percent. There are special rules which apply to married couples, residents of rural areas, Public Assistance recipients, and Social Security beneficiaries. Due to space limitations these groups will be ignored.

The unusual aspect of Mr. Ryan's bill is the reliance on the month as the central time period with the year used as a restraint. The subchapter on Administration states:

> "Sec. 1611. Regulations.
> "The Secretary may prescribe such regulations as may be necessary to carry out the purposes of this chapter.
>
> "Sec. 1612. Application for Benefits.
> "An eligible individual may apply for an income maintenance benefit under section 1602 for a month at such time and in such manner as the Secretary or his delegate shall prescribe by regulation. Such regulations may provide that an eligible individual may apply for benefits for more than one month in a single application. Two or more eligible individuals may apply jointly for benefits to which each is entitled.
>
> "Sec. 1613. Payment of Benefits.
> "At such time as may be prescribed by regulations, but not later than 180 days after the close of each month, the Secretary or his delegate shall pay an income maintenance benefit to each eligible individual entitled to receive such a benefit under section 1602 for such month, ...

"Sec. 1614. Procedure and Enforcement.

.
.
.

"(c) Collection of Overpayments.--If an individual receives any payment under this chapter to which he is not entitled or which is in excess of the amount to which he is entitled under section 1602, the Secretary or his delegate may recover such payment or the amount of such excess only by withholding it from subsequent income maintenance benefits to which such individual is entitled under this chapter."[27]

While the above sections illustrate the importance of the month, section 1605 shows the use of the year.

"Sec. 1605. Imposition of Tax on Excess Annual Income.

"(a) Net Annual Income Defined.--For purposes of this section, the term 'excess annual income' means (1) the income of an individual during the taxable year plus the income for each calendar month which ends in such taxable year of any other individual who is an eligible dependent of such eligible individual for such calendar month, less (2) 150 percent of the sum of the minimum standard deduction (whether or not such individual computes his tax under chapter 1 on the basis of such deduction) plus any exemptions to which such individual is entitled under section 151.

"(b) Imposition of Tax.--If for any calendar month ending in the taxable year an individual receives an income maintenance benefit, and such individual has excess annual income, then in addition to any tax imposed on such individual under section 1 for such taxable year, there is imposed on such individual a tax equal to the lesser of--

"(1) one-half of the excess annual income of such individual for such taxable year, or

"(2) the aggregate amount of income maintenance benefits paid to such individual during such taxable year."[28]

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[27]H.R. 17331, 90th Cong., 2nd Sess., secs. 1611, 1612, 1613, and 1614(c) (1968).

[28]Ibid., sec. 1605.

Note that the monthly and annual breakeven levels of income are different. A family of four would have a monthly guarantee of $167 and a breakeven income level of $334. Annualized the $334 would be $4008. The annual breakeven point as described in section 1605 is $4500. In other words an individual could conceivably receive excess income in some months and still be allowed to keep all of the subsidy paid in other months.

Implied in the bill is the use of monthly ex post income statements. However, the language of the bill is liberal enough to allow the Secretary of the Treasury to establish ex anti procedures. The implication of ex post statements is drawn from the paragraph covering overpayments. Mr. Ryan, obviously does not anticipate a large number of significant overpayments, due to the use of ex post statements. This creates a dilemma. This chapter and the previous one combined to illustrate the dangers in using ex post statements. They also indicated the occurrence of overpayments when statements of expected income are used. The solution is relatively simple. Chapter IV will present ways to recover overpayments created by the use of ex anti statements. The dilemma does illustrate one more trap into which a negative income tax proponent can fall.

It seems appropriate to make comment on some of the more unusual aspects of Mr. Ryan's bill. The differences between the monthly and annual breakeven points is seen as an imaginative idea which deserves further economic development.

The introduction of the special handling of rural and other groups has drawn theoretical attention, but to this writer's knowledge Mr. Ryan has written the first concrete plan to deal with these situations. Finally, the bill creates a Bureau of Income Maintenance under the Secretary of the Treasury.[29] Earlier discussions in this chapter indicate that such action may not be the most efficient course available.

The Tobin, Pechman, Mieszkowski Plan

The Tobin, Pechman, Mieszkowski negative tax plan actually develops two methods of payment.

> . . .: (1) automatic payments of full basic allowances to all families, except those who waive payments in order to avoid withholding of the offsetting tax on other earnings; (2) payment of net benefits upon the execution of a declaration of estimated income, ...[30]

The first method of payment introduces an idea analogous to the Social Dividend Plan. There are two drawbacks to this method of payment. One, as the authors suggest it may well be difficult to convince the average man that this is not some wild give away program where money is paid to everyone, including the rich.[31] Secondly, their analysis does not take into account changes in income, and their affect on over- and under-payments.

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[29]Ibid., sec. 4.

[30]Tobin, Pechman, and Mieszkowski, p. 21.

[31]Ibid., p. 22.

This is the same shortcoming found in method two. Tobin, Pechman, and Mieszkowski implicitly hold the same philosophy toward overpayments as the Rippon Society. That is, overpayments will not constitute a serious problem.[32] The examples delineated in Chapter V indicate that this theory concerning overpayments is most probably inaccurate. It is felt that either of the two methods developed by Tobin, Pechman, and Mieszkowski would function as a negative tax payments mechanism if the ideas developed in this thesis, especially those from Chapter IV and V, were incorporated into the plans.

Summary

In order to achieve a well organized, efficient negative income tax program it is necessary to achieve a balance between what tend to be mutually exclusive goals. The first two systems illustrate this point. A negative income tax is not as simple to administer as it first appears, nor is it absolutely certain that it will be more efficient or economical than current income maintenance programs. The second two examples help to illustrate the lack of goal orientation in some negative tax plans. The problems associated with the need-payment lag and over- and under-payments cannot be disregarded or underrated.

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[32] Ibid., p. 23.

Summary

This chapter has attempted to lay a foundation upon which a framework for a payments schema can be built. The framework will be affected by the type of plan as well as the type of administration. The chapter has argued that an EX-MSD plan administered by the SSA and policed by the IRS is the most feasible and efficient combination available. This type of organization also offers a simpler, clearer picture for analyzing the timing problem. Therefore, these ideas will be the basic foundation for the timing study.

CHAPTER III

PROPOSED ADMINISTRATIVE FRAMEWORK

Chapter II has formulized a base on which to build a timing framework. Chapter III will develop the administrative part of that framework. The various functions that an administration would have to carry on are analyzed. The functions are processing, policing, and payment. A general description of the procedures employed in each function will be given.

Processing Function

Processing a new applicant and reflecting changes in a recipient's status are integral problems in a timing mechanism. As indicated this function can be divided into two segments, initial processing for the new applicant and periodic review and special processing for the current recipient. Reduction of the timing problem depends upon the efficient operation of both segments of this function. The initial processing is critical to the minimization of the need-payment lag. The effective review and special handling of current cases is likewise necessary to minimize over- and under-payments.[1]

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[1]There will be some cross effects. That is, initial processing will affect over- and under-payments as reviewing

The initial processing under a negative income tax system would necessitate: one, the filing of an expected income statement; two, a review and examination of that statement; three, the processing of the statement and the initiation of certain required records; and four, the issuance of a check. The first two steps are relatively simple. The expected income statement reflects the beliefs of the recipient with regard to his future income. He alone would know what his income should be. Furthermore, only future expected income is considered, hence, the agency must accept the statement at its face value. Step two would be limited to checking for accuracy and prevention of overt fraud.

The third step is more complicated. First records must be opened and the individual or family identified in some orderly fashion. Additional information necessary to the operation of the negative tax system would be required. The exact nature of this information cannot be determined until the definitions of taxable family unit and income are determined. Other corollary information would most probably be entered into the file. Such information as job qualifications, aptitudes, and the like could be used in a program of interagency coordination of job placement and social services. Finally, the income statement would be filed and arranged to be updated and verified periodically or when the need arises.

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will affect the need-payment lag. However, these relationships are relatively less important than those mentioned in the text.

The fourth function, payment, will be dealt with in detail below.

Periodic processing is necessary to minimize over- and under-payments and to insure adequate timely payments. Periodic processing should be divided into separate types. One is routine processing. This would verify original and revised data and prevent incorrect information from affecting a recipient's payments indefinitely. The first need is an ex post income report. Periodic refiling of ex ante income statements is also necessary. In order to promote efficiency it is suggested that these statements be filed together. One could not hope that these reports would be filed on January 1 if they are filed together. The best solution would be to have the recipient file the ex ante statement with the ex post report on or before April 15. While the ex ante report would be belated, benefits would be accrued through the elimination of double filing. Most problems caused by late filing could be eliminated if the recipients are made aware of the importance of the second type of periodic processing.

Special processing would be needed should a change occur in the family unit's makeup, expected future income, the realization of expected income, or any other relevant variable. Prompt action must be taken at all times on such changes. If the recipients are made to realize the importance of reporting such changes, especially when they would tend to reduce payments, serious over- and under-payment problems could be avoided.

If the general rules laid out above are followed and the information kept simple enough few problems not already being handled by such agencies as the SSA and the Bureau of Public Assistance will occur. The simplicity mentioned is in the ease of filing data of all types mentioned with the administrator. Chiefly the income statement is of concern. To illustrate this point the SSA income estimate form is part of the ex post report. The form is a computer punch card which asks two simple questions concerning future income: "a. Show your expected total earnings for 1968 . . ." and "b. Are you now EITHER working as an employee OR performing substantial services in selfemployment?" The ex post statement is also simple asking only that the individual list his past year's income. Obviously, such a form is easy to handle and involves minimal problems. On the other hand should welfare assistance, OASDHI payments, or other presently non-taxable items be included in the definition of income the processing problems begin to multiply. Next the two more concrete functions of policing and payments will be duscussed.

Policing Function

Policing of a negative tax system is an absolute must. If cheating and fraud are overtly permitted the system will collapse. A negative income tax timing mechanism should try to emulate and where possible improve on the current self-assessment positive tax system. This is not to imply that all individuals will attempt to cheat should they have the

opportunity nor is this to say that some individuals will refrain from fraud no matter how stringent the policing. A balance must be found to ensure efficient, just operation of a negative tax scheme without allowing the policing to become too costly or unnecessarily oppressive and suspicious.

The basis for payment under the negative tax is the ex anti income statement. This report is taken solely on the word of the recipient. The SSA relies on the same sort of information. It finds that:

> To learn of the occurrence of events that affect continuing eligibility, the Administration relies primarily on reports by the beneficiaries themselves, and experience thus far shows that overall this works out well.[2]

The SSA does run routine checks on the ex post reports. The process is described thusly:

> After annual reports have been processed for a specific year, the Administration makes a routine check to determine how effectively beneficiaries have complied with reporting requirements. This process consists of a comparison between total earnings on the annual report submitted by the beneficiary, and total earnings reported on tax returns to BDPA [Bureau of Data Processing and Accounts] by him or by his employer. If the comparison indicates possible ommissions on the annual report that would affect deductions, development is made to determine the exact earnings for the year and, where appropriate, the monthly services performed.[3]

The IRS uses the same type of general check on tax returns. Either agency could run this original check, and initiate further inquiries if necessary. Two problems prevent

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[2]U.S., Department of Health, Education, and Welfare, Social Security Administration, Claims Manual, sec. 5000.

[3]Ibid., sec. 5101 (e).

this automatic check from being universal. One, while most workers (employed and self-employed) are taxable under OASDHI and/or withholding there are small groups which do not have to report. Secondly, since under self employment both reports are originated by the same individual the automatic checking becomes somewhat questionable. The major problem areas would be in agriculture and some service occupations notably household workers. However, these remain the exception rather than the rule. Table I sheds some light on the question. The categories Clerical and Sales, Craftsmen and Foremen, Operatives and Laborers contain over sixty per cent of the poor working household heads. It seems logical to assume that the overwhelming majority in these groups do not fall under the two exceptions, workers not covered and the self employed. Adding to this number those in the other groups who are employed and covered the problem becomes less significant. For the exceptions the only practical answer is for the IRS to police them as they do tax returns.

Payment Function

The payment function is the most important to be considered in this paper. Basically the payment will be arrived at by operating on the given values of earned income, family size, number of payments to be made in the period, the break-even level of income, and the negative tax rate or rates through a formula to arrive at a periodic payment. The problem occurs when one of the variables changes during the

TABLE I

INCIDENCE OF POVERTY IN 1966: EMPLOYMENT STATUS AND OCCUPATION OF HEAD OF HOUSEHOLD

Number and Percent of Families

	Total Heads of Households (thousands)	Number of Poor	Poor as % of Total Heads of Hslds.	Percentage Distribution
Total	48,922	6,086	12.4	
Employment Status and occupation of head:				
Employed, March 1967	38,885	3,020	7.8	100.0
Professional & technical workers	5,338	129	2.4	4.3
Farmers and farm managers	1,588	315	19.8	10.4
Managers, officials, and proprietors (except farm)	5,759	233	4.0	7.7
Clerical & sales	5,146	225	4.4	7.5
Craftsmen and foremen	8,050	353	4.4	11.7
Operatives	7,696	746	8.4	24.7
Service workers	3,011	585	19.4	19.4
Private households	282	154	54.6	5.1
Laborers (except mine)	2,297	533	23.2	17.6
Unemployed	904	248	27.4	
Not in labor force	9,132	2,817	30.8	

Source: Mollie Orshansky, "The Shape of Poverty in 1966," Social Security Bulletin, 31 (March, 1968), Table 6, p. 11.

defined period. The most likely one to change and the most difficult to account for is earned income.

To consider this function in an organized manner two assumptions must be made. Assume that after the negative tax ex ante income estimate is filed a recipient will encounter only one change in his expected or realized income. Assume also that all those who file ex ante statements will report such change. Note that there will be some individuals who will not file an ex ante statement and/or will not revise their estimates out of ignorance, fear, health, prejudice or other reasons. A massive publicity campaign may perhaps reduce the size of this group. Remaining cases will have to be handled individually as they come to the attention of the administrator. Now all possible examples can be placed into three categories as shown in Table II.

TABLE II

SUMMARY OF POSSIBLE NEGATIVE INCOME TAX CASES RESULTING FROM ONE CHANGE IN INCOME

Category	Description of Change and Category Characteristics
Category 1	Any decrease in revised expected income or realized income. Requires change in subsidy. Causes underpayments.
Category 2	An increase in revised expected income or realized income which will not necessitate repayment of any previously paid subsidy. Requires change in subsidy. Causes overpayments.
Category 3	An increase in revised expected income or realized income which will require the repayment of all or part of previously paid subsidy. Requires elimination of subsidy. Causes overpayments.

The first category is relatively simple to characterize. It includes all changes in a recipient's income which results in a realized income less than the original estimate or a revised expected income which is smaller than the original estimate.

The other two categories involve changes in a recipient's income which causes the individual or family to expect or realize more than the original estimate. Category 2 includes all such changes which do not require repayment of subsidy. These changes are of relatively small magnitude. Changes which fall into Category 2 always result in a realized or revised expected income less than the breakeven level.

Considering only subsidies already paid in the period in question Category 3 includes all increases in income (realized or revised expected) which demand repayment of all or part of that subsidy. Such changes can be large or small. Changes which leave realized or revised expected income below the breakeven level of income requires repayment of part of the subsidy. Changes which leave said income at or above the breakeven level require repayment of all of the subsidy in question.

Category one is the cause of underpayments. A smaller revised expected or realized income means that negative tax payments will have to be increased. This, of course, can be accomplished by an increase in the periodic payments. Theoretically underpayments could be eliminated if: one, payments are made ex post, that is, at the end of the subperiod

(quarter, month, week, etc.); and two, there is no need-payment lag. These two situations, especially the lag, will prevent the complete elimination of underpayments. However, underpayments can be minimized by learning of decreases in expected income when they occur, by increasing the size of the periodic payments accordingly, and possibly by including any withholding tax payments in the increased subsidy.[4]

Categories two and three are the chief causes of overpayments. Both of these groups require a decrease or elimination of subsidy payments and in the case of Category 3 a repayment of subsidy. Again the need-payment lag will be a major factor in the occurrence of overpayments. Overpayments should be recovered, as much as possible, through a withholding scheme. This is the subject of discussion in Chapter IV.

Other Administrative Considerations

Another administrative problem concerns the mobility of recipients. It is suggested that the SSA procedures be followed in this matter. Under SSA procedures an individual secures a Social Security number at a local office. The required information is gathered and forwarded to one of six

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[4]Note that even though actual income at the end of the full period may be less than breakeven income (gross income less EX-MSD) under certain circumstances withholding may occur. It can be observed that withholding schedules are based on time as well as earnings. In other words an income paid over a fraction of a period will "appear" to be larger than it actually is.

regional offices. These offices are called payment offices. They become the permanent custodian of the individuals complete file. A summary sheet is sent to any office that the individual becomes associated with in the future. For example, a beneficiary who acquired his card in Stillwater, Oklahoma, would always have his permanent record in Kansas City, Missouri, no matter where he moved within the United States. Actual payments are made by the Treasury Department from information supplied by the payment offices.[5] A similar procedure could be followed in a negative income tax mechanism.

Summary

Chapter III has attempted to illustrate the types of administrative functions that a negative tax system would have to undertake. In addition the chapter indicated briefly the general procedures which would be required of an efficient income maintenance operation. It is important to understand that the payments function is the most important carried on by this type of poverty relief program. All other functions should aid the payments function in achieving the main goal of income maintenance. Functions which may interfere with this goal will have to be weighed carefully. Such procedures may be necessary for the long run success of the

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[5]Bill Godwin, Oklahoma City District Office, Social Security Administration, Private Interview, Oklahoma City, Oklahoma, November 22, 1968.

program, but they also must be relegated to their proper priority level.

CHAPTER IV

WITHHOLDING REVISION AND THE REDUCTION OF OVERPAYMENTS

From the previous discussions it should be obvious that a system of withholding income at the source is important to the efficient functioning of a timing schema. Derivation of such a system will be the subject of this chapter.

Before beginning, several assumptions must be made. First, only one change in expected income will be permitted (that change being an increase). Second, it is necessary for a recipient to be able to indicate to his employer that he has received negative tax payments during the year and that he should be subject to the special withholding rates. It is assumed that this is accomplished by indicating same on the Employee's Withholding Exemption Certificate, the so called W-4 form. Third, for reasons that will become obvious later the negative tax rate is assumed to be greater than the current withholding rate. This is not too restrictive considering that the withholding rate never exceeds 33% and is greater than 20% only when taxable income exceeds $8800 per year.

The final assumption is the most important. The need-payment lag is assumed to be zero. This assumption is made:

one, for simplicity in analyzing the withholding problem; and two, because the exact effect of these lags on withholding is not clear. An example will help explain this second reason. Since all changes in expected income are increases, many cases will require the elimination of negative tax payments. It would seem logical that in many cases payment could be stopped and the need-payment lag eliminated. In other cases the check may not be stopped immediately. In other words because the lag cannot be precisely defined it will be assumed to be zero.

The Model

The General Model

To understand what changes must be made in the withholding system it would be helpful to understand the mechanics of the overpayment problem. The subsidy paid an individual or family is a function of the breakeven level of income, the negative income tax rate and the individual's expected income. The annual subsidy (S_A) can be defined as:

$$S_A = r(B-E),$$

where r is the negative tax rate, B is the breakeven level of income and E is the expected annual income.[1] Note that B is always greater than E since this equation describes a negative tax recipient.

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[1]The rate r could be a system of rates, but this would only tend to confuse the analysis while not adding substance.

When expected income increases the amount of subsidy owed to the individual or family will decrease. The new subsidy which can be described as the final subsidy is defined as:

$$S_A' = b_0 r(B-E'), \tag{4-1}$$

where b_0 is a function of B and E', characterized by the following properties:

$$\begin{aligned} b_0 &= 1, \text{ for } B>E', \\ b_0 &= 0, \text{ for } B\leq E', \end{aligned} \tag{4-1a}$$

where E' is the new expected income. Now expectation of future income can change at any time during the year. Hence, some but not all of the original subsidy will have been paid. The amount of subsidy already paid can be written:

$$S_p = (1-t)r(B-E), \tag{4-2}$$

where t is that portion of the period (year) remaining. The value of t has the property:

$$0<t<1.$$

This means that if t equals 0.25 three quarters of the original subsidy has already been paid to the recipient, and one quarter, three months, of the year remains.

The next step is to subtract the amount of subsidy that should be paid, S_A', from the amount that has been paid, S_p.

$$R = b_1(S_p - S_A'), \tag{4-3}$$

where b_1 is a function of B, E, and E', characterized by the properties:

$$b_1 = 1, \text{ for } S_p > S'_A, \qquad b_1 = 0, \text{ for } S_p \leq S'_A, \tag{4-3a}$$

and where R is the amount which the recipient must return in order to eliminate the projected overpayment. Note that if R is zero this indicates that the adjustment to the change in expected income can be handled solely by a decrease or elimination of negative tax payments. Substituting (4-1) and (4-2) into (4-3) yields:

$$R = b_1 r[(1-t)(B-E) - b_0(B-E')]. \tag{4-4}$$

Since R is the total projected overpayment which should be collected from the recipient, $\frac{R}{tN}$ represents the amount which should be withheld in each pay period. The symbol N is the number of subperiods in each period (12, months; 52, weeks). Dividing both sides of (4-4) by tN yields:

$$\frac{R}{tN} = \frac{b_1 r[(1-t)(B-E) - b_0(B-E')]}{tN}. \tag{4-5}$$

Next the subperiod income should be defined. The new expected income is E'. The original expected income is E. The amount (1-t)E is that part of the original expected income which has been earned up until the time expected income changes. The term,

$$E' - (1-t)E,$$

describes the amount of income earned after the change in

expected income. Dividing by tN the term,

$$\frac{E' - (1-t)E}{tN},$$

is the recipient's subperiod income.

Negative tax payments consider family size in payments. It would seem logical to include family size in subperiod income. This can be done by subtracting the subperiod value of EX-MSD, which changes with family size from subperiod income. The resultant taxable subperiod income is written:

$$\frac{E' - (1-t)E}{tN} - \frac{X}{N},$$

where X is the annual value of EX-MSD.

Logically there should be some value, say j, which when multiplied by subperiod taxable income yields the amount which should be withheld during every subperiod, $\frac{R}{tN}$. This value can be found by dividing equation (4-5) by subperiod taxable income. This operation yields:

$$j = \frac{\frac{b_1 r[(1-t)(B-E) - b_0(B-E')]}{tN}}{\frac{E' - (1-t)E}{tN} - \frac{X}{N}}.$$

Multiplying the right side of the equation by $\frac{tN}{tN}$ the equation simplifies to:

$$j = \frac{b_1 r[(1-t)(B-E) - b_0(B-E')]}{E' - (1-t)E - tX} \qquad (4\text{-}6)$$

By substituting proper values for b_0 two related equations

can be written:

$$j = \frac{b_1 r[(1-t)(B-E) - b_0(B-E')]}{E' - (1-t)E - tX},$$

$$\text{or} \quad j = \frac{b_1 r[E' - (1-t)E - tB]}{E' - (1-t)E - tX}, \tag{4-7}$$

for $b_0 = 1$, or $B>E'$; or,

$$j = \frac{b_1 r[(1-t)(B-E)]}{E' - (1-t)E - tX},$$

$$\text{or} \quad j = \frac{b_1 r[B - (1-t)E - tB]}{E' - (1-t)E - tX}, \tag{4-8}$$

for $b_0 = 0$, or $B \leq E'$. Table III indicates the value of j relative to r under given circumstances.

The final step in arriving at a general model is to include the operation of the current withholding system. In doing so a special negative tax withholding rate will be developed. This rate will be applied to negative tax recipients only. For this reason the current withholding rate and this new negative tax withholding rate will be separate and both types of withholding will be present. In an actual system the rates may be merged for recipients, but for now this would only serve to cloud certain concepts rather than add to the analysis.

The amount withheld over the last t part of the year is given by:

$$W = b_2 w\left[\frac{E' - (1-t)E}{tN} - \frac{X}{N}\right], \tag{4-9}$$

TABLE III

RELATIONSHIP OF r AND j: GIVEN RELATIVE VALUES OF B, E[1] AND X.[2]

$b_0 = 1$, and $b_1 = 1$:	
$B = X$	$r = j$
$B > X$	$r > j$
$B < X$	$r < j$
$b_0 = 1$, and $b_1 = 0$:	
$B = X$	$r > j = 0$
$B > X$	$r > j = 0$
$B < X$	$r > j = 0$
$b_0 = 0$, and $b_1 = 1$:	
$B = X$	$r > j$
$B > X$	$r > j$
$B < X$	$r \gtrless j$

[2]The case of $b_0 = 0$, and $b_1 = 0$ was not considered because if $b_0 = 0$ then b_1 must be equal to one. This is true because S_p is always greater than zero and S_A is equal to zero when $b_0 = 0$. See equations (4-1a) and (4-3a).

where W is the amount withheld during each subperiod, w is the withholding rate (or rates), and b_2 is a function of E', E, X, and t, characterized by the properties:

$$b_2 = 1 \text{ for, } \frac{E' - (1-t)E}{tN} > \frac{X}{N},$$

$$b_2 = 0 \text{ for, } \frac{E' - (1-t)E}{tN} \leq \frac{X}{N}. \qquad (4\text{-}9a)$$

Withholding schedules are based on the assumption that the ratio of subperiod income to annual income is equal to the reciprocal of the number of subperiods. That is, if an individual earns $100 in a given month the withholding tax schedule assumes that the ratio of the $100 to total income is equal to 1/12, the reciprocal of the number of months. The individual is expected to receive $1200 of income in the year. For incomes with this relationship the amount withheld and the annual tax liability are practically equal to $13,000 of taxable income.[3] Because of this a problem arises in that formula (4-9) is based on income paid over a time period less than a year. Taxable subperiod income will be greater than needed to meet annual tax liability requirements. The excess withholding in each subperiod can be shown by:

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[3]U.S., Treasury Department, Internal Revenue Service, Circular E: Employer's Tax Guide (Washington, D.C.: Government Printing Office, 1968), pp. 19-21; U.S., Treasury Department, Internal Revenue Service, 1968 Federal Income Tax Forms (Washington, D.C.: Government Printing Office, 1968), p. 11.

$$W_e = b_{2w}\left[\frac{E' - (1-t)E}{tN} - \frac{X}{N}\right] - b_{3w}\left[\frac{E' - X}{tN}\right], \qquad (4\text{-}10)$$

where W_e is the excess withholding in each subperiod,

$$w\left[\frac{E' - X}{tN}\right],^4$$

indicates the tax liability allocated to each subperiod, and b_3 is a function of E' and X characterized by the properties:

$$\begin{aligned} b_3 &= 1 \text{ for, } E' \geq X, \\ b_3 &= 0 \text{ for, } E' < X. \end{aligned} \qquad (4\text{-}10a)$$

Subtracting W_e from $\frac{R}{tN}$ will yield the net amount of repayment per subperiod needed to reduce overpayments to zero. This equation can be written:

$$\frac{R}{tN} - W_e = b_1 r\left[\frac{(1-t)(B-e) - b_0(B-E')}{tN}\right] - b_{2w}\left[\frac{E' - (1-t)E}{tN} - \frac{X}{N}\right] + b_{3w}\left[\frac{E' - X}{tN}\right].$$

Dividing this equation by the subperiod income yields a rate, k, the negative tax withholding rate.

$$k = \frac{b_1 r\left[\frac{(1-t)(B-E) - b_0(B-E')}{tN}\right] - b_2 w\left[\frac{E' - (1-t)E - tX}{tN}\right] + b_3 w\left[\frac{E-X}{tN}\right]}{\frac{E' - (1-t)E - tX}{tN}}$$

Multiplying by $\frac{tN}{tN}$ and simplifying leaves:

$$k = \frac{b_1 r[(1-t)(B-E) - b_0(B-E')] - w[b_2\{E' - (1-t)E - tX\} - b_3(E'-X)]}{E' - (1-t)E - tX} \qquad (4\text{-}11)$$

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[4] This term holds for $(E'-X) \leq \$13{,}000$. To discuss taxable income in excess of $13,000 seems to be unnecessary in view of the general purposes of a negative income tax.

Can any assumptions be made concerning the value of k? In introducing withholding it was suggested that not all of the amount withheld was needed for actual withholding purposes. This means that some of the amount withheld can be applied to the projected overpayment. In all cases k will be less than or equal to the value of j, as the numerator of (4-11) is less than or equal to the numerator of (4-6).

The Specific Model

Equation (4-11) is a general statement which holds under any conditions. Chapter II indicated that the specific plan discussed would be a fractional EX-MSD plan. For the equation this means that B = X. Rewriting (4-11) and the dummy variable equations yields:

$$k = \frac{b_1 r[(1-t)(X-E)-b_0(X-E')] - w[b_2\{E'-(1-t)E-tX\} - b_3(E'-X)]}{E' - (1-t)E - tX}$$

where b_0, b_1, b_2, and b_3 are characterized by the following properties:

$b_0 = 1$ for, $X > E'$, $\quad b_0 = 0$ for, $X \leq E'$,
$b_1 = 1$ for, $E'-(1-t)E-tX>0$, $\quad b_1 = 0$ for, $E'-(1-t)E-tX\leq 0$,[5]
$b_2 = 1$ for, $E'-(1-t)E-tX>0$, $\quad b_2 = 0$ for, $E'-(1-t)E-tX\leq 0$,[6]
$b_3 = 1$ for, $X \leq E'$, $\quad b_3 = 0$ for, $X' > E'$.

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[5] $b_1 = 1$ if $r(1-t)(X-E) > r(X-E')$,
or $X-tX-(1-t)E > X-E'$,
or $E'-(1-t)E-tX > 0$.

[6] $b_2 = 1$ if $\frac{E'-(1-t)E}{tN} > \frac{X}{N}$, multiply by tN,
$E'-(1-t)E > tX$,
or $E'-(1-t)E-tX > 0$.

Therefore $b_1 = b_2$ and $1-b_0 = b_3$. For $X = B$, only the case of $b_1 = 1$ need be considered.[7] Equation (4-11) can now be rewritten:

$$k = \frac{r[(1-t)(X-E)-b_0(X-E')]-w[E'-(1-t)E-tX-(1-b_0)(E'-X)]}{E' - (1-t)E - tX} \tag{4-12}$$

Now allow b_0 to be zero and one. This generates two equations:

$$k = \frac{r[E' - (1-t)E - tX] - w[E' - (1-t)E - tX]}{E' - (1-t)E - tX},$$

$$k = (r-w)\left[\frac{E' - (1-t)E - tX}{E' - (1-t)E - tX}\right], \tag{4-13}$$

$$k = (r-w), \tag{4-13a}$$

for $b_0 = 1$;

$$k = \frac{r[X - (1-t)E - tX] - w[X - (1-t)E - tX]}{E' - (1-t)E - tX},$$

$$k = (r-w)\left[\frac{X - (1-t)E - tX}{E' - (1-t)E - tX}\right], \tag{4-14}$$

$$k \lesseqgtr (r-w), \text{ as } X \lesseqgtr E', \tag{4-14a}$$

for $b_0 = 0$.

But, k is the rate applicable to current subperiod income.

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[7] This statement can be demonstrated in the following way:

$b_1 = 0$ if, $E' - (1-t)E - tX \lesseqgtr 0$,
or, $E' \lesseqgtr (1-t)E + tX$,
if $E = X$ then, $E' \lesseqgtr X$
but $E < X$ because $B = X$,
therefore, $E' \lesseqgtr (1-t)E - tX < X$,
or, $E' < X$, and $b_0 = 1$.

If $b_1 = 0$ and $b_0 = 1$ the numerator of (3-11) is equal to zero, and any change should be reflected in negative tax payments.

For the amount which must be collected both sides of (4-12) will be multiplied by the subperiod taxable income. The new equations which hold under equilibrium, i.e., no overpayment or underpayment, can be written:

$$k\left[\frac{E' - (1-t)E}{tN} - \frac{X}{N}\right]$$

$$= \frac{r[(1-t)(X-E)-b_0(X-E')] - w[E'-(1-t)E-tX-(1-b_0)(E'-X)]}{tN},$$

$$= \frac{r[X-(1-t)E-tX-b_0X+b_0E'] - w[X-(1-t)E-tX-b_0X+b_0E']}{tN},$$

$$= (r-w)\left[\frac{X-(1-t)E}{tN} - \frac{b_0(X-E')}{tN} - \frac{X}{N}\right], \qquad (4\text{-}15)$$

$$k\left[\frac{E'-(1-t)E}{tN} - \frac{X}{N}\right] = (r-w)\left[\frac{E'-(1-t)E}{tN} - \frac{X}{N}\right], \qquad (4\text{-}16)$$

for $b_0 = 1$;

$$k\left[\frac{E'-(1-t)E}{tN} - \frac{X}{N}\right] = (r-w)\left[\frac{X-(1-t)E}{tN} - \frac{X}{N}\right], \qquad (4\text{-}17)$$

for $b_0 = 0$.

Application of the Model

Here lies a juncture in the analysis. How shall (4-12) or its related equation (4-15) be used? Three general courses seem to be available. Two methods involve the use of the formulas in their entirety. The results of their accurate application would be the elimination of over- and under-payments, under the assumptions listed at the beginning of this chapter. The use of these formulae would, however, be difficult.

Currently a formula similar to (4-9) is in use to compute withholding liability. It is modified by the fact that the first bracketed term is considered one variable. The term

$$\frac{E' - (1-t)E}{tN}$$

is a statement of current subperiod wages, called C. The expression can be written:

$$W = b_2 w(C - \frac{X}{N}), \tag{4-18}$$

where b_2 has the properties:

$$b_2 = 1 \text{ for, } C > X/N$$
$$b_2 = 0 \text{ for, } C \leq X/N.$$

The amount withheld is based on three variables, C, X, and N. All three of these variables are readily observable. The rate w can be considered a constant. The three variables are fairly easy to tabulate. By having separate tables based on N (weekly, biweekly, monthly, etc.) and by using C and X as rows and columns or by operating on these two variables to obtain taxable income and using this figure in a row the liability W is easily found.[8]

The case of $b_0 = 1$ for the equations (4-12) and (4-15) would work in the same manner as the current withholding system. However, to know b_0 the value of E' must be available. Furthermore to compute negative tax withholding for $b_0 = 0$ the values of E and t must be known. While t is

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[8]U.S., Treasury Department, Internal Revenue Service, Circular E: Employer's Tax Guide, pp. 19-41.

observable, E' and E are known only by the individual recipients and must be obtained from them. Above these considerations is the increase in the number of variables which precludes the tabulation of withholding tax liability for negative tax recipients. The only method of finding this liability is by operation of formula (4-15).

Two entities could operate on this formula. One, the employer could operate the formula. This seems to be unwise. For one, the formula would unduly complicate a relatively simple system. Secondly, the increased paperwork may well prejudice an employer against hiring a negative tax recipient. Such a situation would be highly undesirable.

Alternatively the administrative agency itself could be the operator. The value k = r-w will always yield a repayment greater than or equal to the necessary return. If the employer uses k = r-w the negative tax administrator could operate on the equation (4-15). The administrator would subtract the amount given by (4-15) from the amount withheld by the employer. The amount withheld by the employer can be written:

$$(r-w)\left[\frac{E' - (1-t)E}{tN} - \frac{X}{N}\right].$$

The difference is then written:

$$S'' = (r-w)\left[\frac{E'-(1-t)E}{tN} - \frac{X}{N}\right] - (r-w)\left[\frac{X-(1-t)E}{tN} - \frac{b_0(X-E')}{tN} - \frac{X}{N}\right].$$

The operation would not be as difficult as it first appears as the equation reduces to:

$$S'' = (r-w)\left[\frac{E'-(1-t)E}{tN} - \frac{X-(1-t)E}{tN} + \frac{b_0(X-E')}{tN} - \frac{X}{N} - \frac{X}{N}\right],$$

$$\text{or } S'' = (r-w)\left[\frac{E'-X-b_0(E'-X)}{tN}\right],$$

$$\text{or } S'' = (r-w)\left[\frac{(1-b_0)(E'-X)}{tN}\right]. \qquad (4\text{-}19)$$

S'' indicates the new subperiod subsidy to be paid by the negative income tax administrator.

There are reasons for not using (4-15) explicitly and for not allowing the administration to reimburse the over taxed recipient-worker. One could argue that this would create burdensome administrative problems. Also there may be a case for the existence of a payment illusion. One could argue that the higher withholding (caused by k = r-w when k could be less than r-w) and the resultant lower take home pay may cause some recipients to feel that working is not worth the effort. In any case the second course of action would be to set $k \leq r-w$. The rate k would be decreased in relation to some variable, most probably taxable subperiod income.

In essence this would mean the replacement of k for w in equation (4-18). The analogy to the current withholding system ends here. The current system assumes that the subperiod income has been earned and will be earned in every subperiod of the year. The assumption made in this section that income increases at some time during the year is exactly opposite to the current assumption. To change this negative tax assumption to correspond to the current assumption would be illogical. It is impossible here and now to select a value or values for k. This is a separate study. To evaluate

k one would need to have a sample of potential negative tax recipients (the CGF project offers an excellent possibility). Next all changes in income for the individuals in the sample would have to be traced and the values of k computed for each subperiod. The values of k could be tested for correlation to taxable subperiod income or any other variable deemed appropriate. If it is found that k is correlated to any of these variables a system of k values similar to w values could be found. While this paper cannot investigate the correct values of k, the writer does not wish to dismiss the assignment of k values. Instead it is suggested that any value of k such that,

$$0 < k \leq (r-w), \qquad (4\text{-}20)$$

is better than k = 0. In other words any legitimate value of k (defined by 4-20) would be better than not providing any special negative tax withholding schedule.

Summary

Chapter IV has discussed changes in the current withholding tax structure which would make a negative income tax system more responsive to projected overpayments. Chapter V will attempt to evaluate these suggestions. The two proposed changes in the withholding system will be tested. The method of full withholding such that, k = r-w with the administrator resubsidizing the projected overwithholding, the method of choosing arbitrary k values, and the current

withholding method will be examined side by side for purposes of contrast and comparison. The question of multiple income changes will also be examined.

CHAPTER V

EVALUATION OF THE PROPOSED MECHANISM

Chapter V will be concerned with the evaluation of the principles developed above. It will begin with a review of the need-payment lag as based on findings in Chapter II and revised by comments concerning administration in Chapter III. After the basic need-payment lags are established the proposals for changing the withholding tax structure will be discussed and evaluated, and examples of alternate situations will be analyzed.

Need-Payment Lag

Conclusions as to the length of need-payment lags under a negative tax timing mechanism will of necessity be somewhat arbitrary. Their foundations must lie in examples offered by presently operating institutions. These foundations will be altered through the evaluation of problems peculiar to a negative income tax. The exact nature or extent of all such peculiar problems cannot really be known until a pilot program is initiated. Furthermore, current problems being handled by existing institutions may either expand or diminish depending on circumstances. The semiconflicting goals of need-payment lag minimization and administrative cost

efficiency should necessarily receive consideration. This section will analyze current institutional functions and then discuss peculiar negative tax problems.

Current Institutions

In order to form a basic conception of what the need-payment lag must be the SSA and the Oklahoma Public Assistance procedures will be analyzed. One point in this discussion will concern the exact type of payment. The payments can be made ex antè, at the beginning of the subperiod or ex post, at the end of the subperiod. Because it is the current trend in most institutions and because it is intuitively the most feasible, the month will be considered the subperiod. Ex antè payments will be made on the first day of the month. Ex post payments will be considered to be made on the last day of the month.[1] The SSA makes ex post payments, and the Oklahoma Public Welfare Department issues ex antè payments.

The initial check from the SSA comes on the average six weeks after the date of application. That is, a claim filed about the middle of June would warrant a July check, dated July 31. A claim filed on June 1 would receive a June payment about the middle of July and a July payment as above. The claim is assumed to be made ex antè of earned income. The initial theoretical need-payment lag would be six weeks.

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[1]The SSA actually pays on the third day of the following month; however, assumption of payment on the last day will add to the clarity of the discussion.

Actual periodic corrections would depend chiefly on the frequency of the communication between the recipient and the administration. It is assumed that the recipient informs the SSA immediately of any change in status. Again it will take six weeks to effect a correction in a recipient's payments, the exception being a complete cessation of payment. Such action requires approximately fifteen days to complete.[2] It can be shown that one or two incorrect payments may be made during this interval. The general SSA procedure for handling incorrect payments especially those entailing overpayments, is to have the recipient return the check and await issuance of another payment. Six weeks will not elapse between date of return and reissuance as the matter of return is settled in the first interview immediately after the change of status.[3]

Turning to the Oklahoma Public Welfare system reveals a different type of organization. For one, payments are made ex anti. Initial processing requires on the average only one month. If processing is completed after the first but before the twentieth of the month a check is issued for that month.[4] Initial processing can, therefore, create up to a five and

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[2]Bill Godwin, Oklahoma City District Office, Social Security Administration, Private Interview, Oklahoma City, Oklahoma, November 22, 1968.

[3]Ibid.

[4]Dale Mitchell, Director of the Division of Research and Statistics, Department of Public Welfare, State of Oklahoma, Private Interview, Oklahoma City, Oklahoma, November 22, 1968.

one-half weeks need-payment lag. Changes in status are reflected in the following check. Hence, in essence no lag is encountered for periodic processing. Next problems peculiar to or more acute in a negative tax system will be analyzed.

Peculiar Negative Tax Problems

There does not appear to be any negative tax situation which would constitute a completely new problem in relation to current institutions. The main differences concern the frequency and magnitude of certain occurrences. Chiefly these include an increase in the absolute number of case loads, and an increase in changes of status. Changes of status will normally be income changes. It is logical to anticipate that the proportion of changes in status would be greater for negative tax recipients than SSA beneficiaries where status changes occur rather infrequently.[5] It is also logical to assume that such a statement is also true of the relationship between negative tax recipients and Public Assistance recipients, the reasons being the nature of the people who receive Public Assistance aid. Since this aid is given to the old, disabled, blind, and families with dependent children it is obvious that the labor force participation rates for these groups would be far less than the broader classification of all poor who would receive negative income tax payments.

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[5]"Current Operating Statistics," Table Q-13, p. 51.

The combination of these two differences would create additional work for the administrative agency. If the staffs of the current institutions remain at present levels, the need-payment lag would certainly increase. But, there would very likely be an increase in administrative personnel. This coupled with wider use of modern data processing yields no necessary difference between current lags and projected negative tax lags. There is the possibility of increased lags, but circumstances do not warrant their injection at this point. The final arbiter of an increase in the need-payment lag will be Congress. Their definition of family unit, income, and investigative restrictions will determine positively if any increase in current estimates are needed.

Collation and Summation

Since no extra lag time is herein attributed to negative tax plans per se the time periods suggested in the section on current institutions will stand. Table IV summarizes these time lags. At least in this matter it appears that Public Assistance is a superior system; it is quicker in reacting to changes in status than the SSA. This may be because Public Assistance is state controlled and therefore smaller in scope and more easily administered. Data in the SSA must travel from the District Office to the Regional Payment Office and then to the Treasury. This obviously lengthens the time involved.

Does this finding conflict with the earlier suggestion that the SSA would be the best administrator of a negative

TABLE IV

NEED-PAYMENT LAGS

Cause of Lag	Social Security Administration		Public Assistance	
	Number of Erroneous Payments	Length of Lag	Number of Erroneous Payments	Length of Lag
Initial: Application to Start Payment	0	Six Weeks	0	Thirty Days
Periodic: Stop Payment	0-1	Fifteen Days	0-1	Not Appreciable
Periodic: Alter Payment	1-2	Six Weeks	0-1	Not Appreciable
Periodic: Interstate Change in Residence	0	None	0-2 or more	Thirty Days or more

Source: Bill Godwin, Oklahoma City District Office, Social Security Administration, Private Interview, Oklahoma City, Oklahoma, November 22, 1968; Dale Mitchell, Director of Research and Statistics, Department of Public Welfare, State of Oklahoma, Private Interview, Oklahoma City, Oklahoma, November 22, 1968.

tax system? Not necessarily. An important consideration is interstate mobility. As indicated in chapter two, interstate mobility creates a major Public Assistance drawback as it is presently constituted. Termination and reprocessing would most likely cause loss of one or more monthly payments. Individual states would be most anxious to recover overpayments as soon as possible, and would exert pressure on the recipient to accomplish same. Finally there is the problem of uniformity among the states. Both of these situations combined indicate that this type of administration would reduce mobility. Interferences with worker and recipient mobility should generally be rejected as interferences with economic efficiency.

A final note concerns the previously suggested possibility of a nationally administered system of Public Assistance. Under such a program it would be difficult to argue that the Public Assistance lag estimates given in Table IV would be applicable. Such a system would likely have lags somewhere between those of the SSA and the current Public Assistance systems. The lags will be closer to those associated with current Public Assistance the more autonomous the state agencies are, and closer to the SSA lags the more nationalized the system becomes. Since any national system would probably resemble the SSA in administrative techniques, the lags given in Table IV will not be altered. These lags will be accepted as given.

Over- and Under-Payments

Chapter IV developed two withholding systems which would be feasible to operate in a negative tax system. It was stated at that time that these two plans would be tested. This will be done by delineating several possible examples of families with changing incomes. These examples will be set forth by using the formulae developed in Chapter IV, current withholding schedules and positive tax liability formulas. The results derived from the proposals will be compared to those derived using present procedures. Before undertaking this type of analysis some general remarks must be made concerning changes in income.

Decreases in Expected Income[6]

Decreases in income in a negative tax system will not normally lead to an overpayment. As expectation of future income decreases the total subsidy due will be greater than originally estimated. This, of course, means that the subperiod subsidy originally paid is too low. Therefore, the subsidy must be revised upward. If it is not increased an underpayment will result. Obviously the only way an overpayment would occur is if the revised subsidy were to be too high, or in other words, a mistake is made.

There are many possible methods of handling this increase in subsidy. Because of the earlier findings concerning

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[6]See Category 1 in Table II, page 41.

lags two possibilities readily suggest themselves. One, the individual's current payments could be stopped. The amount already paid would be subtracted from the new amount due and this remainder would be spread over the remaining payment subperiods. The first check would be mailed as soon as possible. Judging from earlier information this would be approximately six weeks after the recipient notifies the agency of a decrease in income. For example, a recipient loses his income (which was originally small) on March 1. He notifies the negative tax administrator on that day. The agency would stop payment of his March 31 subsidy. A review and recalculation of his subsidy would be made. The revised March check would be delivered around April 15 followed by a revised April payment on the thirtieth of that month. The process would then continue as normal.

The second solution is not to stop the checks, but to recalculate the recipient's subsidy under the assumption that one or two more subsidy payments of the old amount will be issued. The timing of the subsidy payments will not be altered. Using the example above the recipient would receive a March 31 check in the amount of the original subsidy. The April 30 check would be revised to reflect the correct amount. Payments would continue as usual showing the new payment. This plan will be called Plan 4 in the examples. The first proposal is Plan 3.

Increases in Income[7]

Increases in income fall into two main groups. One, increases in income which require a change in subsidy paid without requiring any repayments. Such changes are analogous to decreases in income and will be handled in the same manner. Other increases will require repayment of all or part of the subsidy. Four different approaches for handling such changes will be studied.

In Chapter IV it was suggested that there were two practical alternatives to the operation of Formula (4-15). One thought was to have the employer apply the negative income tax withholding rate, k, such that $k = r-w$,[8] and allow the negative tax administration to resubsidize any projected underpayment. This will be called Plan 1 in the examples.

A second alternative, Plan 2 would have the employer apply some arbitrary rate such that,

$$0 < k \leq r-w.$$

To study this hypothesis Plan 2 is divided into two sub-plans. Plan 2a describes k as,

$$k = 1\%,$$

and Plan 2b sets,

$$k = r-w.$$

Plan 2a is used to demonstrate that any positive value of k

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[7]See categories 2 and 3 in Table II, page 41.

[8]To review the terms, r is the negative income tax rate and w is the current withholding tax rate.

will generally be superior to k = 0. Plan 2b, on the other hand, illustrates the maximum effect that Plan 2 would have. The unaltered current withholding system will constitute the fourth approach.

Examples

Eleven examples were chosen. These examples were selected by using random numbers. The method of selection and computation and the results including monthly summaries can be found in Appendix A. A summary of the characteristics of the examples is given in Table V. Table VI reviews the plans. The important results derived from the examples are given in Table VII. There were several assumptions made concerning the examples which should be stated at this time. The income and subsidy payments were considered to be smooth or constant for each subperiod. The subperiod operated in is the month. All changes in income were assumed to occur and be reported on the first day of the month.

In order to fully understand their importance the columns of Table VII should be explained. Column one, Over- (Under-) Payment, indicates the dollar amount of over- and under-payments generated by the various proposals. Column 2, Over- (Under-) Payment as a Percentage of Next January's Income, gives an index of the effect of over- and under-payments. It is assumed that the individual or family will continue to earn the same gross income. Hence, this percentage indicates the relative value of over- or under-payments in relation to their projected net monthly income.

TABLE V

SUMMARY OF EXAMPLES

Example	E[9]	E'[9]	X[9]	t[9]
A	$1300	$2400	$2300	9/12
B	100	6600	900	8/12
C	800	1300	3700	2/12
D	3600	4100	5100	4/12
E	600	1600	1600	3/12
F	100	2500	3000	3/12
G	1500	5700	3700	7/12
H	3300	2100	6500	10/12
I	7500	5100	6500	8/12
J	100	3700	6500	7/12
K	3100	6000 2700	5100	11/12 7/12

[9]To review, the variables are: E is the original expected income; E' is the revised expected income; X is EX-MSD; and t is that fraction of the period remaining after the change in income.

TABLE VI

SUMMARY OF PLANS

Plans	Characteristics
1	k = r-w, a revised subsidy is issued by the administrator.
2a	k = 1%.
2b	k = r-w.
3	Subsidy payment is stopped and revised subsidy is distributed over remaining subperiods.
3a	Same as 3 except negative tax withholding is refunded.
4	Subsidy payment is continued, revised subsidy reflects the extra payments.
4a	Same as 4 except negative tax withholding is refunded.

TABLE VII

SUMMARY OF EXAMPLE RESULTS

Plans	Over (Under) Payments 1	Over (Under) Payments % of Jan. Income 2	Marginal Tax Rate 3	Marginal Tax Rate Plan 1 with revisions 4	Net Income of Period n as % of Period n-1 5	k 6
A:						26.48
Current	$ 91.71	40.73	38.52			
Plan 1	2.52	1.12	49.90	45.80		
Plan 2a	88.20	39.15	38.83			
Plan 2b	(32.48)	(14.87)	49.90			
B:						1.53
Current	$ 91.25	13.63	22.76			
Plan 1	(25.43)	(3.80)	49.98	20.93		
Plan 2a	31.57	4.72	23.68			
Plan 2b	(1,678.43)	(250.18)	49.98			
C:						36.00
Current	$ 6.05	1.92	48.79			
Plan 1	0.17	0.05	49.96	49.96		
Plan 2a	5.89	1.87	48.82			
Plan 2b	0.17	0.05	49.96			
D:						0
Current	0	0	50.00			
Plan 1	0	0	50.00	50.00		
Plan 2a	0	0	50.00			
Plan 2b	0	0	50.00			
E:						35.21
Current	$ 263.46	76.10	23.68			
Plan 1	1.32	0.38	49.87	49.87		
Plan 2a	255.99	73.95	24.40			
Plan 2b	1.32	0.38	49.87			
F:						32.84
Current	$ 549.83	77.18	27.09			
Plan 1	0.32	0.04	49.99	49.99		
Plan 2a	533.09	74.82	27.79			
Plan 2b	0.32	0.04	49.99			

TABLE VII (Continued)

Plans	Over (Under) Payments 1	Over (Under) Payments % of Jan. Income 2	Marginal Tax Rate 3	Marginal Tax Rate Plan 1 with revisions 4	Net Income of Period n as % of Period n-1 5	k 6
G:						10.09
Current	$ 294.47	44.89	26.77			
Plan 1	(12.45)	(1.90)	50.03	31.42		
Plan 2a	265.35	40.45	27.47			
Plan 2b	(682.45)	(104.03)	50.03			
H:						
Plan 3	0	0			37.96	
Plan 4	0	0			70.61	
I:						
Plan 3	$(46.56)	(10.74)			52.99	
Plan 4	(46.56)	(10.74)			52.99	
J:						
Plan 3	0	0			190.04	
Plan 4	200.00	37.58			287.01	
K: Plan 3						7.62
Current	$(41.10)	(15.38)	36.80		21.54	
Plan 1	(145.29)	(54.40)	49.98	38.03	21.68	
Plan 2a	(44.52)	(16.66)	37.24		21.59	
Plan 2b	(145.29)	(54.40)	49.98		23.12	
K: Plan 3a						7.62
Plan 1	$(41.10)	(15.38)	49.98	38.03	21.68	
Plan 2a	(41.10)	(15.38)	37.24		21.59	
Plan 2b	(41.10)	(15.38)	49.98		23.12	
K: Plan 4						7.62
Current	$(41.10)	(15.38)	36.80		21.54	
Plan 1	(145.29)	(54.40)	49.98	38.03	27.91	
Plan 2a	(44.52)	(16.66)	37.24		21.59	
Plan 2b	(145.29)	(54.40)	49.98		23.12	
K: Plan 4a						7.62
Plan 1	$(41.10)	(15.38)	49.98	38.03	27.91	
Plan 2a	(41.10)	(15.38)	37.24		21.59	
Plan 2b	(41.10)	(15.38)	49.98		23.12	

Column three, Marginal Tax Rate, is simply the loss of subsidy plus withholding over the increase in gross income. Column four is the Marginal Tax Rate when the revised subsidy for Plan 1 is included. This is not a true marginal tax rate but it does give an indication of the effect of Plan 1's revised subsidy on the recipient's net income. Column 5, Net Income of the Change Month as a Percentage of the Previous Month's Income, is used for Plans 3 and 4 to show the impact of changes on disposable income. Column 6 is simply the calculated value of k.

Evaluation

It should be noted that Example D is of a class all its own. It does not really fit with increases in income resulting in repayments of subsidy, nor does it fit into any other category. The reason is that taxable subperiod income after the change in income is zero. Example D requires no changes in subsidy nor repayment of subsidy, but is handled simply by stopping the subsidy. Example D is, therefore, the example situated between Plans 1 and 2 and Plans 3 and 4, but affected by none of these proposals.

What about changes in income which do not require a repayment of subsidy? The Examples H, I, and J demonstrate that neither Plan 3 or Plan 4 offers an optimal solution. As shown by Example I, families entering the negative tax program after the first of the year, there is no substantial difference between the two plans. Example H shows that Plan 4 is superior for decreases in the income of current

recipients. Note, while neither plan results in an over- or under-payment, net income under Plan 3 is much more volatile than net income under Plan 4. Column 5 of Table VII indicates that under Plan 3 the recipient will incur a sixty-two percent decrease in take home pay, while he loses only thirty percent under Plan 4. Gross earned income falls by forty-four percent.

On the other hand Example J demonstrates the superiority of Plan 3 under certain cases of increasing income. The issuance of the extra payment under Plan 4 results in an overpayment. Plan 4 will not always generate an overpayment under these general circumstances of an increase in income, but as illustrated an overpayment is a possibility. Also under this example it is Plan 4 which generates the more volatile net income.

The solution lies in one of two possible changes. One, use Plan 4 for decreases in income and Plan 3 for increases in income. The second change is to modify Plan 4 to include the stopping of one or more payments associated with such cases as Example J. The only difference between the two solutions will be in the way revised payments are distributed over the remaining months. The examples in Appendix A illustrate this point.

Evaluation of increases in income resulting in repayment of all or part of the subsidy previously paid is more difficult. Observation of the data in Table VII reveals that any of the three proposed plans, 1, 2a, and 2b, would reduce the

amount of overpayment. However, these reductions are related to increases in the marginal tax rate. On an a priori basis it can be shown that a decrease in overpayments will mean an increase in the amount withheld from gross income. Because the change in gross income is constant the marginal tax rate must necessarily rise.

This can be demonstrated on an empirical plane. Take the differences between the over- or under-payments associated with Plans 2a and 2b and the current system. Rank these differences with the increases in the marginal tax rate and apply the rank correlation technique. The resultant correlation coefficient for Plan 2a is,

$$r_s = -0.7857,$$

and the coefficient for Plan 2b is,

$$r_s = -0.8286.$$

Both correlation coefficients are significant at the five percent level.[10] In other words there exists a dependency between increases in the marginal tax rate and decreases in overpayments.

Obviously if there was a positive relationship there would be no problem in choosing the superior system. The

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[10] E. G. Olds, "Distribution of Sums of Squares of Rank Differences for Small Numbers of Individuals," The Annals of Mathematical Statistics, 9 (1938), Table IV, p. 145. A correlation coefficient for Plan 1 is not available because of the introduction of the revised subsidy. Without this subsidy Plan 1 would be equivalent to Plan 2b.

complication of the negative correlation introduces the need for subjective judgment. Table VIII may aid in such a decision. The Table shows the elasticity coefficients for the percentage change in overpayments relative to the percentage change in the marginal tax rates. To illustrate for Example A, a Plan 2a negative tax withholding system which yields a one percent increase in the marginal tax rate will cause a 4.76 percent decrease in the amount of overpayment.[11] Five of the six examples yield elastic coefficients. Unless it can be demonstrated that the increased marginal tax rates will greatly decrease work effort incentive it would be wiser to eliminate the overpayments by one of the proposals.

In support of decreasing overpayments one should note Column two of Table VII. Two of the examples, A and G, show that over forty percent of one month's income would be needed to repay the overpayment. Two other examples, E and F, show that the recipient would have to give up three quarters of his take home pay in order to satisfy his overpayment debt. These results, in four of the six cases which show repayment of subsidy, demonstrate the need for some sort of automatic repayment system. As shown both Plan 1 and Plan 2 would provide for this automatic collection.

It is interesting to note that Plans 2a and 2b were offered in support of the statement in Chapter IV which

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[11]Note that a one percent increase in the marginal tax rate does not mean the addition of one percentage point to the rate (i.e., 25% to 26%), but indicates an increase of one percent of the original rate (i.e., 25% to 25.25%).

TABLE VIII

ELASTICITY COEFFICIENTS OF OVERPAYMENTS TO RELATIVE CHANGES IN MARGINAL TAX RATES

Examples	Elasticity Coefficients Plan 1	Elasticity Coefficients Plan 2a	Elasticity Coefficients Plan 2b
A	3.29	4.76	4.58
B	1.07	59.49	16.22
C	40.52	43.01	40.53
E	0.90	0.93	0.90
F	1.18	1.18	1.18
G	1.20	3.78	3.82

indicated that any k with the characteristics,

$$r\text{-}w \geq k > 0,$$

was better than k = 0. The elasticities shown above tend to support this statement. The statement itself was made in connection with the possibility of a floating k which would vary with some other observable variable. The rank correlation technique was applied to the calculated k in relation to several other variables. The results are found in Table IX. Because of the small number of observations and because of the method of example selection these relationships are offered only as indications for future study. This writer does not suggest that these correlations are final.

Finally some comments on the multiple example, K, are in order. Example K illustrates that multiple changes in income introduce no substantive difficulties to the timing mechanism. However, it is true that there exists a great deal more complexity of calculation in this type of example. Example K carried one proposal which could be expanded and which could have been incorporated in Example I. The negative tax withholdings were rechanneled back to the recipient. The same could have been done for the normal withholdings. The absolute amount of such withholding would not normally be large and the final decision on its return should be based on costs of obtaining the information and administering the remittance.

TABLE IX

RANK CORRELATION COEFFICIENTS OF
k AND RELATED VARIABLES

Related Variable	Correlation Coefficients	Significance at .05 Level
Subperiod Taxable Income	-0.7143	Not Significant
Subperiod Gross Income	-0.5429	Not Significant
Final Annual Income (E')	-0.9429	Significant
Annual Taxable Income (E'-X)	-0.9429	Significant
Number of Months Remaining (t)	-0.7857	Significant

Summary

The first half of this chapter dealt with the problem of the need-payment lag. Existing lags in the current institutions were examined. Next problems which would be peculiar or more acute under a negative tax system were introduced. While it is obviously impossible to reduce the need-payment lag to zero the minimal time requirements were established and summarized in Table IV. With these lags as a base the proposals for a change in the withholding system as well as other methods of reacting to recipient income changes were evaluated. The results of this discussion were based primarily on the data in Tables VII and VIII. Final conclusions will be collated and discussed in the next chapter.

CHAPTER VI

CONCLUSION

This study was designed to analyze the payments mechanism of a negative income tax system. The central theme was the optimization of the two primary goals associated with a timing schema, the two goals being the elimination of the need-payment lag and the eradication of over- and underpayments. Action taken to achieve the goals was held subordinate to the primary negative tax goal of income maintenance, and restrained by the need for reasonable costs. With this in mind the need-payment goal was given top priority.

The Findings

It was argued and demonstrated that a national organization dealing in social services should administer a negative tax program. The only available organization with these qualities is the Social Security Administration. The possibility of a new national Public Assistance program was not eliminated from consideration. It was shown, however, that a truly national Public Assistance organization would most probably be patterned after SSA methods and procedures. Because of this the analysis of the need-payment lag concerned

itself primarily with the SSA. The Oklahoma Public Assistance program was offered as a contrast to the SSA results. The current Public Assistance program was ruled out due to problems concerning recipient mobility and uniform application of the program.

Analysis of the need-payment lag indicated that it could be reduced to six weeks for the starting and changing of payments, and to two weeks for complete cessation of payments. The changes of payments refer only to the amount of subsidy. Transfers of residence or job (if wages were the same) or other changes not affecting income or family size would create no lag problem under a nationally administered program such as the SSA could provide. It was shown that under a system of monthly subsidation that from zero to two incorrect checks could be issued.

The possible issuance of incorrect payments and the distinct possibility that recipients will not inform the administration immediately of changes in status or will not be accurate in their estimates of future income creates problems related to the second goal. Over- and under-payments were found to be an important obstacle in the creation of a true income maintenance program. Over- and under-payments will be discussed in two groups. The first will be those associated with changes in income which require cessation of original subsidy and repayment of all or part of the paid subsidy. The second group will be concerned with changes which require changes in subsidy payments only.

Situations of the first type result chiefly in overpayments. It was shown that burdensome overpayments could result if some method was not employed to automatically rectify the misappropriations.[1] Toward establishment of an automatic collection method equation (4-12),

$$k = \frac{r[(1-t)(X-E)-b_0(X-E')] - w[E'-(1-t)E-tX-(1-b_0)(E'-X)]}{E'-(1-t)E-tX}$$

was developed. The value of k is the rate which when applied to subperiod taxable income would yield the correct repayment. It was established that equation (4-12) and the related formula (4-15) could be used in three different ways. One suggestion that the employer operate the formulae was disregarded immediately. The other two suggestions, one calling for a floating k the other suggesting a resubsidation of projected underpayments were developed for further evaluation.

Evaluation of the two plans revealed that either would reduce the absolute amount of overpayments as well as soften the relative impact of the repayment. The one drawback in the findings was the inverse relationship between changes in overpayments and the marginal tax rate. Analysis of the elasticity coefficient relating these two variables indicated that increases in marginal tax rates were generally associated with relatively larger decreases in overpayments. Unless it can be shown that the work incentive impact of increases in the marginal tax rates produces more harmful

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[1]See Appendix A, examples A, E, F, and G.

effects than the burdensome overpayments either of the two plans offered would constitute an improvement over present operations. Remember that only absolutely small overpayment amounts can be disregarded. Overpayments must and will be collected either during the period in question or shortly thereafter.

Other overpayments can be caused by changes which occur so close to the end of the period that the need-payment lag precludes direct action on the subsidy during the period in question. However, it should be noted that the stop payment lag is relatively short, two weeks, compared to the period, fifty-two weeks. Therefore, the overpayment could not be expected to be of an excessive amount. In any case the overpayment would be carried into the next period and the discrepancy settled at that time. Greater problems would occur if the recipient did not inform the administration of increases in income when they occur.

Underpayments under the first set of circumstances would occur only if a mistake were made or if the k value applied were too large. This would only occur under the floating k plan. The magnitude of such underpayments or the related overpayments would depend on the variance of observed k values around the true calculated k.

The second type of over- and under-payments occurs for changes which require recalculation of the subsidy. In these situations underpayments would occur under two circumstances other than an error. One, if the recipient fails to notify

the agency of the need for increased payment and two, the change occurs too close to the end of the period to effect a change in that period. In the first case little can be done. In the second case the amount should be relatively small. Overpayments could occur only if Plan 4 in Chapter V was used and only if there was a decrease in needed subsidy. As shown in that chapter this problem is resolved by using Plan 3 on such cases.

Reviewing briefly it can be seen that all over- and under-payments accruing to a given period can be prevented, except for those caused by lack of communication or lack of time. Over- and under-payments caused by these exceptions will be settled in the following periods. Those caused from lack of communication are to a large extent insolvable under any negative tax plan. Over- and under-payments occurring due to the lack of time to react are bound to be relatively small. The final source of possible over- or under-payments could come through the use of the floating k value. Decision on the use of such a plan would have to be based on any cost savings in relation to the occurrence and magnitude of over- and under-payments.

Recommendations for Further Study

The lack of properly kept records indicating changes in income and other status requirements coupled with the lack of time and money to trace through other records constituted the single most limiting factor of this thesis. The records of

the Council for Grants to Families should provide a treasure of usable data to further analyze payment mechanism requirements. Because of their frequency CGF income statements would provide a useful key to the exact changes in recipients income. Study of this data may even reveal that the over- and under-payment problem is not as acute as this paper observes it to be.

The major advantage of the CGF data will be to supply information for study of the k value. With the comprehensive CGF records the advisability of using a floating k plan can be evaluated and analyzed.

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APPENDIX A

APPENDIX A

In order to evaluate the suggested changes in the withholding tax structure examples of possible negative tax situations were chosen. The examples were formulated from a table of random digits. The table was entered and about seventy-five preliminary examples were selected. This was done by writing the numbers as they appeared, thusly:

1324...093.

The numbers were then punctuated to yield:

1300; 2400; 9; 3.

In this case the number 3 indicates the number of exemptions to which the family in question was entitled to claim under IRS laws. The term expands to yield an EX-MSD of $2300. The terms then form the Example, A, such that:

E = $1300; E' = $2400; t = 9/12; and X = $2300.[1]

As indicated seventy-five preliminary examples were chosen. Many of these were eliminated because they did not fit the study or they violated the assumptions given below. For instance, in many cases both E and E' were greater than X. Such an example is useless in demonstrating negative tax

[1]Reviewing the important variables and their definitions yields the following: E is the original expected income; E' is the revised expected income; t is that fraction of the period remaining after the change in income; X is EX-MSD; r is the negative tax rate; w is the current withholding tax rate; and k is the negative tax withholding rate.

operations. The technique of selection was used for one main reason. This writer wished to eliminate the conscious or subconscious choice of only those examples which would demonstrate the results derived by analysis and theory in this thesis. In other words it is desirable to reduce as much as possible the subjective selection of examples.

Next, certain assumptions were made concerning the examples and the operations to be performed on the examples. All incomes and subsidies were considered to be smooth flows with equal amounts accruing to each subperiod. All changes in income were assumed to occur and be reported on the first day of the month in which the change takes place. The month constituted the subperiod.

The calculations were made following these assumptions and using formulas derived in Chapter IV. To illustrate, the calculations for Example A will briefly be described. The original earned income is given by:

$$\frac{E}{N},$$

or,

$$\frac{\$1300}{12} = \$108.33.$$

The original subperiod subsidy is given by:

$$\frac{r(X-E)}{N},$$

or,

$$\frac{.5(\$2300-\$1300)}{12} = \$41.67.$$

The new income is given by:

$$\frac{E'-(1-t)E}{tN},$$

or,

$$\frac{\$2400-(1-9/12)\$1300}{(9/12)\cdot 12} = \$230.55.$$

There is no new subsidy as $E' > X$.

The revised subsidy under Plan 1 is given by formula (4-19). The negative tax withholding amounts under Plans 1, 2a, and 2b are derived by applying $k = r-w$, $k = 1\%$, and $k = r-w$ respectively to subperiod taxable income. Revised subsidies under Plans 3 and 4 are calculated as described in the text (Chapter V).

APPENDIX A - TABLE I

EXAMPLES: MONTHLY SUMMARIES

	Jan.	Feb.	March	April
Example A: E = $1300; E' = $2400; X = $2300; t = 9/12.				
Earned Income	108.33	108.33	108.34	230.55
Original Subsidy	41.67	41.67	41.66	
Current Withholding				5.41
Net Income (Current Plan)	150.00	150.00	150.00	225.14
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				13.91
Net Income (Plan 1)	150.00	150.00	150.00	211.23
Negative Tax Withholding				0.39
Net Income (Plan 2a)	150.00	150.00	150.00	224.75
Negative Tax Withholding				13.91
Net Income (Plan 2b)	150.00	150.00	150.00	211.23
Example B: E = $ 100; E' = $6600; X = $ 900; t = 8/12.				
Earned Income	8.33	8.33	8.33	8.34
Original Subsidy	33.33	33.33	33.33	33.34
Current Withholding				
Net Income (Current Plan)	41.66	41.66	41.66	41.68
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				
Net Income (Plan 1)	41.66	41.66	41.66	41.68
Negative Tax Withholding				
Net Income (Plan 2a)	41.66	41.66	41.66	41.68
Negative Tax Withholding				
Net Income (Plan 2b)	41.66	41.66	41.66	41.68
Example C: E = $ 800; E' = $4100; X = $5100; t - 2/12.				
Earned Income	66.67	66.66	66.67	66.67
Original Subsidy	120.83	120.84	120.83	120.83
Current Withholding				
Net Income (Current Plan)	187.50	187.50	187.50	187.50
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				
Net Income (Plan 1)	187.50	187.50	187.50	187.50
Negative Tax Withholding				
Net Income (Plan 2a)	187.50	187.50	187.50	187.50
Negative Tax Withholding				
Net Income (Plan 2b)	187.50	187.50	187.50	187.50

May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
230.56	230.55	230.56	230.55	230.56	230.55	230.56	230.56	2400.00
								125.00
5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	48.69
225.15	225.14	225.15	225.14	225.15	225.14	225.15	225.15	2476.31
4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	36.00
13.91	13.91	13.91	13.91	13.91	13.91	13.91	13.91	125.19
215.74	215.73	215.74	215.73	215.74	215.73	215.74	215.74	2387.12
0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	3.51
224.76	224.75	224.76	224.75	224.76	224.75	224.76	224.76	2472.80
13.91	13.91	13.91	13.91	13.91	13.91	13.91	13.91	125.19
211.24	211.23	211.24	211.23	211.24	211.23	211.24	211.24	2351.12
820.83	820.83	820.83	820.84	820.83	820.84	820.83	820.84	6600.00
								133.33
151.56	151.56	151.56	151.56	151.56	151.56	151.56	151.56	1212.48
669.27	669.27	669.27	669.28	669.27	669.28	669.27	669.28	5520.85
	236.14	236.14	236.14	236.14	236.14	236.14	236.16	1653.00
221.21	221.21	221.21	221.21	221.21	221.21	221.21	221.21	1769.68
448.06	684.20	684.20	684.21	684.20	684.21	684.20	684.23	5404.17
7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46	59.68
661.81	661.81	661.81	661.82	661.81	661.82	661.81	661.82	5461.17
221.21	221.21	221.21	221.21	221.21	221.21	221.21	221.21	1769.68
448.06	448.06	448.06	448.07	448.06	448.07	448.06	448.07	3751.17
66.66	66.67	66.67	66.66	66.67	66.67	316.66	316.67	1300.00
120.84	120.83	120.83	120.84	120.83	120.83			1208.33
						1.14	1.14	2.28
187.50	187.50	187.50	187.50	187.50	187.50	315.52	315.53	2506.05
						2.94	2.94	5.88
187.50	187.50	187.50	187.50	187.50	187.50	312.58	312.59	2500.17
						0.08	0.08	0.16
187.50	187.50	187.50	187.50	187.50	187.50	315.44	315.45	2505.89
						2.94	2.94	5.88
187.50	187.50	187.50	187.50	187.50	187.50	312.58	312.59	2500.17

APPENDIX A - TABLE I

(Continued)

	Jan.	Feb.	March	April
Example D: E = $3600; E' = $4100; X = $5100; t = 4/12.				
Earned Income	300.00	300.00	300.00	300.00
Original Subsidy	62.50	62.50	62.50	62.50
Current Withholding				
Net Income (Current Plan)	362.50	362.50	362.50	362.50
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				
Net Income (Plan 1)	362.50	362.50	362.50	362.50
Negative Tax Withholding				
Net Income (Plan 2a)	362.50	362.50	362.50	362.50
Negative Tax Withholding				
Net Income (Plan 2b)	362.50	362.50	362.50	362.50
Example E: E = $ 600; E' = $1600; X = $1600; t = 3/12.				
Earned Income	50.00	50.00	50.00	50.00
Original Subsidy	41.67	41.66	41.67	41.67
Current Withholding				
Net Income (Current Plan)	91.67	91.66	91.67	91.67
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				
Net Income (Plan 1)	91.67	91.66	91.67	91.67
Negative Tax Withholding				
Net Income (Plan 2a)	91.67	91.66	91.67	91.67
Negative Tax Withholding				
Net Income (Plan 2b)	91.67	91.66	91.67	91.67
Example F: E = $ 100; E' = $2500; X = $3000; t = 3/12.				
Earned Income	8.33	8.34	8.33	8.33
Original Subsidy	120.83	120.84	120.83	120.83
Current Withholding				
Net Income (Current Plan)	129.16	129.18	129.16	129.16
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				
Net Income (Plan 1)	129.16	129.18	129.16	129.16
Negative Tax Withholding				
Net Income (Plan 2a)	129.16	129.18	129.16	129.16
Negative Tax Withholding				
Net Income (Plan 2b)	129.16	129.18	129.16	129.16

May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
300.00	300.00	300.00	300.00	425.00	425.00	425.00	425.00	4100.00
62.50	62.50	62.50	62.50					500.00
362.50	362.50	362.50	362.50	425.00	425.00	425.00	425.00	4600.00
362.50	362.50	362.50	362.50	425.00	425.00	425.00	425.00	4600.00
362.50	362.50	362.50	362.50	425.00	425.00	425.00	425.00	4600.00
362.50	362.50	362.50	362.50	425.00	425.00	425.00	425.00	4600.00
50.00	50.00	50.00	50.00	50.00	383.33	383.34	383.33	1600.00
41.66	41.67	41.67	41.66	41.67				375.00
					37.18	37.18	37.18	111.54
91.66	91.67	91.67	91.66	91.67	346.15	346.16	346.15	1863.46
					87.38	87.38	87.38	262.14
91.66	91.67	91.67	91.66	91.67	258.77	258.78	258.77	1601.32
					2.49	2.49	2.49	7.47
91.66	91.67	91.67	91.66	91.67	343.66	343.67	343.66	1855.99
					87.38	87.38	87.38	262.14
91.66	91.67	91.67	91.66	91.67	258.77	258.78	258.77	1601.32
8.34	8.33	8.33	8.34	8.33	808.33	808.34	808.33	2500.00
120.84	120.83	120.83	120.84	120.83				1087.50
					95.89	95.89	95.89	287.67
129.18	129.16	129.16	129.18	129.16	712.44	712.45	712.44	3299.83
					183.17	183.17	183.17	549.51
129.18	129.16	129.16	129.18	129.16	529.27	529.28	529.27	2750.32
					5.58	5.58	5.58	16.74
129.18	129.16	129.16	129.18	129.16	706.86	706.87	706.86	3283.09
					183.17	183.17	183.17	549.51
129.18	129.16	129.16	129.18	129.16	529.27	529.28	529.27	2750.32

APPENDIX A - TABLE I

(Continued)

	Jan.	Feb.	March	April
Example G: E = $1500; E' = $5700; X = $3700; t = 7/12.				
Earned Income	125.00	125.00	125.00	125.00
Original Subsidy	91.67	91.66	91.67	91.67
Current Withholding				
Net Income (Current Plan)	216.67	216.66	216.67	216.67
Revised Subsidy (Per Plan 1)				
Negative Tax Withholding				
Net Income (Plan 1)	216.67	216.66	216.67	216.67
Negative Tax Withholding				
Net Income (Plan 2a)	216.67	216.66	216.67	216.67
Negative Tax Withholding				
Net Income (Plan 2b)	216.67	216.66	216.67	216.67
Example H: E = $3300; E' = $2100; X = $6500; t = 10/12.				
Earned Income	275.00	275.00	155.00	155.00
Original Subsidy	133.33	133.34		
Current Withholding				
Revised Subsidy (Plan 3)				386.67
Net Income (Plan 3)	408.33	408.34	155.00	541.67
Revised Subsidy (Plan 4)			133.33	200.00
Net Income (Plan 4)	408.33	408.34	288.33	355.00
Example I: E = $7500; E' = $5100; X = $6500; t = 8/12.				
Earned Income	625.00	625.00	625.00	625.00
Original Subsidy				
Current Withholding	11.64	11.64	11.64	11.64
Revised Subsidy (Plan 3)				
Net Income (Plan 3)	613.36	613.36	613.36	613.36
Revised Subsidy (Plan 4)				
Net Income (Plan 4)	613.36	613.36	613.36	613.36
Example J: E = $ 100; E' = $3700; X = $6500; t = 7/12.				
Earned Income	8.33	8.34	8.33	8.33
Original Subsidy	266.67	266.66	266.67	266.67
Current Withholding				
Revised Subsidy (Plan 3)				
Net Income (Plan 3)	275.00	275.00	275.00	275.00
Revised Subsidy (Plan 4)				
Net Income (Plan 4)	275.00	275.00	275.00	275.00

May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
125.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	5700.00
91.66								458.33
	68.98	68.98	68.98	68.98	68.98	68.98	68.98	482.86
216.66	656.02	656.02	656.02	656.02	656.02	656.02	656.02	5675.47
		111.67	111.66	111.67	111.67	111.66	111.67	670.00
	139.56	139.56	139.56	139.56	139.56	139.56	139.56	976.92
216.66	516.46	628.13	628.12	628.13	628.13	628.12	628.13	5368.55
	4.16	4.16	4.16	4.16	4.16	4.16	4.16	29.12
216.66	651.86	651.86	651.86	651.86	651.86	651.86	651.86	5646.35
	139.56	139.56	139.56	139.56	139.56	139.56	139.56	976.92
216.66	516.46	516.46	516.46	516.46	516.46	516.46	516.46	4698.55
155.00	155.00	155.00	155.00	155.00	155.00	155.00	155.00	2100.00
								266.67
193.33	193.33	193.34	193.33	193.33	193.34	193.33	193.33	1933.33
348.33	348.33	348.34	348.33	348.33	348.34	348.33	348.33	4300.00
200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	1933.33
355.00	355.00	355.00	355.00	355.00	355.00	355.00	355.00	4300.00
325.00	325.00	325.00	325.00	325.00	325.00	325.00	325.00	5100.00
								46.56
	175.00	87.50	87.50	87.50	87.50	87.50	87.50	700.00
325.00	500.00	412.50	412.50	412.50	412.50	412.50	412.50	5753.44
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	700.00
325.00	425.00	425.00	425.00	425.00	425.00	425.00	425.00	5753.44
8.34	522.62	522.62	522.62	522.62	522.62	522.62	522.61	3700.00
266.66								1333.33
	19.06	9.52	9.52	9.52	9.52	9.52	9.53	66.67
275.00	522.62	541.68	532.14	532.14	532.14	532.14	532.14	5100.00
	266.67							266.67
275.00	789.29	522.62	522.62	522.62	522.62	522.62	522.61	5300.00

APPENDIX A - TABLE I

(Continued)

	Jan.	Feb.	March	April
Example K: E = $3100; E' = $6000; E"= $2700; t' = 11/12. t"= 8/12 X =				
Earned Income	258.33	521.97	521.97	521.97
Original Subsidy	83.33			
Current Withholding		13.70	13.70	13.70
Revised Subsidy (Plan 3)				
Net Income (Current-3)	341.66	508.27	508.27	508.27
Revised Subsidy (Plan 4)				
Net Income (Current-4)	341.66	508.27	508.27	508.27
Revised Subsidy (Per Plan 1)			31.50	31.50
Negative Tax Withholding		34.73	34.73	34.73
Revised Subsidy (Plan 3)				
Net Income (Plan 1-3)	341.66	473.54	505.04	505.04
Revised Subsidy (Plan 4)				
Net Income (Plan 1-4)	341.66	473.54	505.04	505.04
Revised Subsidy (Plan 3a)				
Net Income (Plan 1-3a)	341.66	473.54	505.04	505.04
Revised Subsidy (Plan 4a)				
Net Income (Plan 1-4a)	341.66	473.54	505.04	505.04
Negative Tax Withholding		1.14	1.14	1.14
Revised Subsidy (Plan 3)				
Net Income (Plan 2a-3)	341.66	507.13	507.13	507.13
Revised Subsidy (Plan 4)				
Net Income (Plan 2a-4)	341.66	507.13	507.13	507.13
Revised Subsidy (Plan 3a)				
Net Income (Plan 2a-3a)	341.66	507.13	507.13	507.13
Revised Subsidy (Plan 4a)				
Net Income (Plan 2a-4a)	341.66	507.13	507.13	507.13
Negative Tax Withholding		34.73	34.73	34.73
Revised Subsidy (Plan 3)				
Net Income (Plan 2b-3)	341.66	473.54	473.54	473.54
Revised Subsidy (Plan 4)				
Net Income (Plan 2b-4)	341.66	473.54	473.54	473.54
Revised Subsidy (Plan 3a)				
Net Income (Plan 2b-3a)	341.66	473.54	473.54	473.54
Revised Subsidy (Plan 4a)				
Net Income (Plan 2b-4a)	341.66	473.54	473.54	473.54

May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
109.47	109.47	109.47	109.47	109.47	109.47	109.47	109.47	2700.00
								83.33
								41.10
	279.19	139.58	139.58	139.58	139.58	139.58	139.58	1116.67
109.47	388.66	249.05	249.05	249.05	249.05	249.05	249.05	3858.90
	159.49	159.53	159.53	159.53	159.53	159.53	159.53	1116.67
109.47	268.96	269.00	269.00	269.00	269.00	269.00	269.00	3858.90
								63.00
								104.19
	263.42	131.71	131.71	131.71	131.71	131.71	131.70	1053.67
109.47	372.89	241.18	241.18	241.18	241.18	241.18	241.17	3754.71
31.50	146.02	146.03	146.02	146.02	146.03	146.02	146.03	1053.67
140.97	255.49	255.50	249.49	249.49	249.50	249.49	249.50	3754.71
	289.46	144.73	144.74	144.73	144.73	144.74	144.73	1157.86
109.47	398.93	254.20	254.21	254.20	254.20	254.21	254.20	3858.90
31.50	160.91	160.91	160.91	160.91	160.91	160.91	160.90	1157.86
140.97	270.38	270.38	270.38	270.38	270.38	270.38	270.37	3858.90
								3.42
	279.17	139.58	139.58	139.58	139.59	139.58	139.59	1116.67
109.47	388.64	249.05	249.05	249.05	249.06	249.05	249.06	3855.48
	159.49	159.53	159.53	159.53	159.53	159.53	159.53	1116.67
109.47	268.96	269.00	269.00	269.00	269.00	269.00	269.00	3855.48
	280.03	140.01	140.01	140.01	140.01	140.01	140.01	1120.09
109.47	389.50	249.48	249.48	249.48	249.48	249.48	249.48	3858.90
	160.01	160.01	160.01	160.01	160.01	160.01	160.03	1120.09
109.47	269.48	269.48	269.48	269.48	269.48	269.48	269.50	3858.90
								104.19
	279.19	139.58	139.58	139.58	139.58	139.58	139.58	1116.67
109.47	388.66	249.05	249.05	249.05	249.05	249.05	249.05	3754.71
	159.49	159.53	159.53	159.53	159.53	159.53	159.53	1116.67
109.47	268.96	269.00	269.00	269.00	269.00	269.00	269.00	3754.71
	305.20	152.61	152.61	152.61	152.61	152.61	152.61	1220.86
109.47	414.67	262.08	262.08	262.08	262.08	262.08	262.08	3858.90
	174.40	174.41	174.41	174.41	174.41	174.41	174.41	1220.86
109.47	283.87	283.88	283.88	283.88	283.88	283.88	283.88	3858.90

APPENDIX A - TABLE II

REVIEW OF PLANS
EXAMPLES A, B, C, D, E, F, and G

Examples and Plans	Total Subsidy Paid	Total Subsidy Due	Excess Subsidy Paid	Total Amount Withheld	Positive Tax Liability
Example A					
Current	125.00	0	125.00	48.69	15.40
Plan 1	161.00	0	161.00	173.88	15.40
Plan 2a	125.00	0	125.00	52.20	15.40
Plan 2b	125.00	0	125.00	173.88	15.40
Example B					
Current	133.33	0	133.33	1212.48	1170.40
Plan 1	1786.33	0	1786.33	2982.16	1170.40
Plan 2a	133.33	0	133.33	1272.16	1170.40
Plan 2b	133.33	0	133.33	2982.16	1170.40
Example C					
Current	1208.33	1200.00	8.33	2.28	0
Plan 1	1208.33	1200.00	8.33	8.16	0
Plan 2a	1208.33	1200.00	8.33	2.44	0
Plan 2b	1208.33	1200.00	8.33	8.16	0
Example D					
Current	500.00	500.00	0	0	0
Plan 1	500.00	500.00	0	0	0
Plan 2a	500.00	500.00	0	0	0
Plan 2b	500.00	500.00	0	0	0
Example E					
Current	375.00	0	375.00	111.54	0
Plan 1	375.00	0	375.00	373.68	0
Plan 2a	375.00	0	375.00	119.01	0
Plan 2b	375.00	0	375.00	373.68	0
Example F					
Current	1087.50	250.00	837.50	287.67	0
Plan 1	1087.50	250.00	837.50	837.18	0
Plan 2a	1087.50	250.00	837.50	304.41	0
Plan 2b	1087.50	250.00	837.50	837.18	0
Example G					
Current	458.33	0	458.33	482.86	319.00
Plan 1	1128.33	0	1128.33	1459.78	319.00
Plan 2a	458.33	0	458.33	511.98	319.00
Plan 2b	458.33	0	458.11	1459.78	319.00

Excess Withheld	Over- (Under-) Payments	Over- (Under-) Payment as % of Jan. Income	Marginal Tax Rate	Calculated Value of k
				26.48
33.29	91.71	40.73	38.52	
158.48	2.52	1.12	49.90	
36.80	88.20	39.15	38.83	
158.40	(33.48)	(14.87)	49.90	
				1.53
42.08	91.25	13.63	22.76	
1811.76	(25.43)	(3.80)	49.98	
101.76	31.57	4.72	23.68	
1811.76	(1678.43)	(250.78)	49.98	
				36.00
2.28	6.05	1.92	48.79	
8.16	0.17	0.05	49.96	
2.44	5.89	1.87	48.82	
8.16	0.17	0.05	49.96	
				0
0	0	0	50.00	
0	0	0	50.00	
0	0	0	50.00	
0	0	0	50.00	
				35.21
111.54	263.46	76.10	23.68	
373.68	1.32	0.38	49.87	
119.01	255.99	73.95	24.40	
373.68	1.32	0.38	49.87	
				32.84
287.67	549.83	77.18	27.09	
837.18	0.32	0.04	49.99	
304.41	533.09	74.82	27.79	
837.18	0.32	0.04	49.99	
				10.09
163.86	294.47	44.89	26.77	
1140.78	(12.45)	(1.90)	50.03	
192.98	265.35	40.45	27.47	
1140.78	(682.45)	(104.03)	50.03	

APPENDIX A - TABLE III

REVIEW OF PLANS
EXAMPLES H, I, AND J

Examples and Plans	Total Subsidy Paid	Total Subsidy Due	Excess Subsidy Paid	Total Amount Withheld	Positive Tax Liability
Example H					
Plan 3	2200.00	2200.00	0	0	0
Plan 4	2200.00	2200.00	0	0	0
Example I					
Plan 3	700.00	700.00	0	46.56	0
Plan 4	700.00	700.00	0	46.56	0
Example J					
Plan 3	1400.00	1400.00	0	0	0
Plan 4	1600.00	1400.00	200.00	0	0

Excess Withheld	Over- (Under-) Payments	Over- (Under-) Payment as % of Jan. Income	Net Income of Period n as % of Period n-1
0	0	0	37.96
0	0	0	70.61
46.56	(46.56)	(10.74)	52.99
46.56	(46.56)	(10.74)	52.99
0	0	0	190.04
0	200.00	38.27	187.01

APPENDIX A - TABLE IV

REVIEW OF PLANS
Example K

Examples and Plans	Total Subsidy Paid	Total Subsidy Due	Excess Subsidy Paid	Total or Excess Withheld[1]	Over- (Under-) Payments
Example K					
Current-3	1200.00	1200.00	0	41.10	(41.10)
Current-4	1200.00	1200.00	0	41.10	(41.10)
Plan 1-3	1200.00	1200.00	0	145.29	(145.29)
Plan 1-4	1200.00	1200.00	0	145.29	(145.29)
Plan 1-3a	1304.19	1200.00	104.19	145.29	(41.10)
Plan 1-4a	1304.19	1200.00	104.19	145.29	(41.10)
Plan 2a-3	1200.00	1200.00	0	44.52	(44.52)
Plan 2a-4	1200.00	1200.00	0	44.52	(44.52)
Plan 2a-3a	1203.42	1200.00	3.42	44.52	(41.10)
Plan 2a-4a	1203.42	1200.00	3.42	44.52	(41.10)
Plan 2b-3	1200.00	1200.00	0	145.29	(145.29)
Plan 2b-4	1200.00	1200.00	0	145.29	(145.29)
Plan 2b-3a	1304.19	1200.00	104.19	145.29	(41.10)
Plan 2b-4a	1304.19	1200.00	104.19	145.29	(41.10)

[1]Because the positive tax liability is zero the total amount withheld will be equal to the excess withheld.

Over- (Under-) Payment as % of Jan. Income	Net Income of Period n as % of Period n-1	Marginal Tax Rate	Calculated Value of k
			7.82
(15.38)	21.54	36.80	
(15.38)	21.54	36.80	
(54.40)	21.68	49.98	
(54.40)	27.91	49.98	
(15.38)	21.68	49.98	
(15.38)	27.91	49.98	
(16.66)	21.59	37.24	
(16.66)	21.59	37.24	
(15.38)	21.59	37.24	
(15.38)	21.59	37.24	
(54.40)	23.12	49.98	
(54.40)	23.12	49.98	
(15.38)	23.12	49.98	
(15.38)	23.12	49.98	

VITA

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