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STUDIES IN FISCAL POLICY

PAPER NO. 2

INDEXING THE INDIVIDUAL INCOME TAX FOR INFLATION: WILL THIS HELP TO STABILIZE THE ECONOMY?

A STUDY

PREPARED FOR THE USE OF THE

SUBCOMMITTEE ON FISCAL POLICY

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

DECEMBER 27, 1976

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LETTERS OF TRANSMITTAL

DECEMBER 22, 1976.

To the Members of the Joint Economic Committee:

Transmitted herewith is a study entitled "Indexing the Individual Income Tax for Inflation: Will This Help To Stabilize the Economy?" This study examines the impact of inflation on personal income tax payments and on after-tax real income and argues that automatic adjustment of the tax system to offset the impact of inflation would contribute to economic stability.

The views expressed in the paper are those of the author and do not necessarily represent the views of the Joint Economic Committee or any of the individual members thereof.

HUBERT H. HUMPHREY,
Chairman, Joint Economic Committee.

DECEMBER 17, 1976.

Hon. HUBERT H. HUMPHREY,
Chairman, Joint Economic Committee,
U.S. Congress, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a study entitled "Indexing the Individual Income Tax for Inflation: Will This Help To Stabilize the Economy?" by Thomas F. Dernburg, professor of economics, The American University. This study is the second in a continuing series designed to examine the role of fiscal policy in achieving stable and healthy economic growth.

The study examines the impact of inflation in pushing individuals into higher personal income tax brackets, using the inflationary period 1973–74 as an illustration. The paper concludes that rising effective tax rates due to inflation intensified the 1974–75 economic downturn and that automatic adjustment of the personal income tax to offset the impact of inflation would contribute to future economic stability.

The conclusions reached in this study will be controversial, but certainly the study is addressed to a question of the greatest importance and will be of real value to those who are concerned with developing policies appropriate to a situation in which both inflation and unemployment are serious problems. On behalf of the Subcommittee, I want to thank Professor Dernburg for undertaking this study.

The views expressed in the study are those of the author and do not necessarily represent the views of the Subcommittee or any of the individual members thereof.

RICHARD BOLLING,
Chairman, Subcommittee on Fiscal Policy.

DECEMBER 15, 1976.

Hon. RICHARD BOLLING,
Chairman, Subcommittee on Fiscal Policy, Joint Economic Committee, U.S. Congress, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a study entitled "Indexing the Individual Income Tax for Inflation: Will This Help To Stabilize the Economy?" This study was prepared by Thomas F. Dernburg, professor of economics, The American University.

The purpose of the study is to examine the merits of automatically adjusting the personal income tax system for inflation, especially from the point-of-view of the contribution which such "indexing" could make to overall economic stability. Professor Dernburg examines the behavior of the tax system during the inflationary period from the fourth quarter of 1973 to the third quarter of 1974. Inflation pushed individuals into higher tax brackets during this period, even though real incomes were declining, and total Federal personal income tax collections measured as a percent of personal income rose rapidly. This further reduced after-tax real incomes and worked to intensify the severe downturn of 1974–75. Professor Dernburg argues that introduction into the income tax of an automatic inflation adjustment factor would provide needed protection against similar occurrences in the future.

Professor Dernburg questions the conventional notion that tax increases (including those automatically induced by inflation) work to correct inflation by providing a more restrictive fiscal policy. He argues that, the anti-inflationary impact of a more restrictive budget is likely to be offset by larger wage increases as workers seek to offset the impact of higher taxes on their after-tax incomes. Thus, while higher taxes work unambiguously to reduce the rate of growth of real output and employment, the effect of rising taxes on the price level is uncertain. The study thus argues that, in general, tax increases are not an efficient anti-inflation measure.

Not everyone will agree with Professor Dernburg's conclusions, but the study addresses an important and very timely aspect of economic policy. The Subcommittee plans to sponsor additional studies of the proper role of fiscal policy in an inflationary environment.

The views expressed in this study are those of the author and do not necessarily reflect the views of Members of the Joint Economic Committee or of the Committee staff.

JOHN R. STARK,
Executive Director, Joint Economic Committee.

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INDEXING THE INDIVIDUAL INCOME TAX FOR INFLATION: WILL THIS HELP TO STABILIZE THE ECONOMY?

By **Thomas F. Dernburg** * **

I. INTRODUCTION AND SUMMARY

Inflation alters both the size and the composition of the Federal Budget in terms of real purchasing power. The mere fact of inflation therefore has profound implications for the impact of the budget on aggregate expenditures; for the equity of our system of taxation; for the size of the Federal government sector; and for the formation of budgetary strategy and policy.

Congress has recognized some of the budgetary problems that are created by inflation, as is reflected in the fact that ever more inflation "correction" or "indexing" has been introduced into various parts of the expenditure side of the budget. A recent study by the Congressional Budget Office [1] shows that in fiscal year 1975 approximately 63 percent of all federal expenditures were either completely indexed by means of cost of living indexes (28 per cent), or "quasi" indexed through such devices as making government payments based on items whose prices increase at the same rate as the price level (35 percent).

This paper examines the implications of switching to an inflation indexed personal income tax. Under such a tax a proportional rise in money income and prices would leave the taxpayer's average rate of tax unchanged. The tax system would, however, remain progressive with respect to changes in real income so that higher income taxpayers would continue to pay a larger fraction of their income than lower income taxpayers.

Although there are numerous considerations that bear on this issue, the primary focus here is on stabilization policy. The traditional view is that an indexed tax system would contribute to cyclical instability because it would reduce the responsiveness of the tax system to swings in national income, and that it would contribute to secular inflation since it could imply a lower average level of taxation. Contemporary circumstances have cast considerable doubt upon the validity of these views. When disturbances that disrupt the economy are due to shifts in aggregate supply, real and nominal income may move in opposite

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* Professor of Economics, the American University.

** The author wishes to thank Courtenay Slater, Lucy Falcone, and Thomas Cator of the Joint Economic Committee staff for their comments and assistance. Interest in the subject of tax indexing began at the time of author's association with the International Monetary Fund. It is appropriate to thank that institution for its support and also to note that an earlier, related, paper (DM/75/15), "Inflation Indexing of the Personal Income Tax: The Case From the Perspective of Stabilization Policy," was issued by the IMF in its Department Memorandum series.

[1] Congressional Budget Office, "The Effect of Inflation on Federal Expenditure," Background Paper No. 9, June 18, 1976. This study was undertaken at the request of Congressman Richard Bolling, Chairman of the Fiscal Subcommittee of the Joint Economic Committee.

directions so that erstwhile automatic stabilizers may become destabilizers. Second, high marginal taxation of nominal income is very likely to provoke an intensification of higher wage demands thereby imposing upon the economy an unwelcome built in source of cost-push inflation. Third, econometric models imply that the reaction of industrial economies to changes in aggregate demand is faster on the output side than it is on the price level side. Therefore, the price-level lag may cause nominal income and unindexed taxes to continue rising even as real output is already falling. Finally, there is the problem that a highly progressive income tax—especially one geared to nominal income—will be incompatible with attempts to establish an incomes policy, because such policy agreements generally imply that the relative shares of the national income will remain fixed over time.

The various considerations discussed in this paper suggest that an indexed personal income tax would have helped to avert the collapse of 1974, that it would tend to stabilize the level of economic activity, that there is little presumption that it would contribute to inflation, and that it might, indeed, do the opposite if it relieved cost and supply pressures.

The debate over the inflation indexing of income taxes has often given the impression that it is nothing more than the old issue of whether policy instruments should be adjusted automatically according to previously prescribed rules or whether these instruments should be altered at the discretion of policy makers. It might, for example, be generally agreed that the progressive income tax geared to money income may cause fiscal drag and other problems, but that the question at issue is whether the tax system should undergo a fundamental reform to prevent automatic damage, or whether the offset should occur through periodic discretionary tax reduction. It is a fundamental contention of this paper that the issue is not one of rules versus authority nor the related question of whether the political system is sufficiently flexible to permit frequent and timely discretionary changes. Rather, the issue is whether good rules for automatic response should be designed and introduced or whether demonstrably bad ones should be retained.

Optimal policy implies the need for both an automatic and a discretionary component. The automatic component should be as neutral as possible in order to avoid becoming a potential source of disruption and instability, and because the discretionary change which will be needed to put the situation right is very likely not to be made until after the damage has been done. It would be far better to ascertain the correct mix of policy at a moment of time, to adopt neutral rules of proportional change that retain the mix as the economy grows, and to utilize discretionary policies to make the marginal adjustments in that mix as dictated by changing circumstances. The issue is whether the rules that are built into the economic system are good rules or bad rules. The argument that a perverse automatic response can always be offset by intelligent discretionary policy is naive, unpersuasive, and harmful.

II. INFLATION DISTORTION AND THE MECHANICS OF INDEXING

Two major sources of distortion in the individual income tax command attention. The first is the progressive rate structure which is applied to nominal income; the second comes from the effect of inflation on taxable income itself. In a progressive system of income taxation, the tax rate applied to incremental income (the marginal rate) exceeds the average rate of tax. A rise in nominal income therefore raises the taxpayer's average tax rate. As was quite clearly demonstrated in 1974 when real income was falling, this aspect of the tax system becomes very troublesome and destructive if the period is also a time of inflation. Under such conditions nominal income may rise even as real income is falling or remaining stationary. A taxpayer who has a higher nominal income but no commensurate increase in his real income will then find that he is subject to a higher average tax rate and that the value of his real after tax (disposable) income is therefore declining. In the aggregate, the ratio of personal taxes to personal income will rise; the budget will automatically become more restrictive; and potential claim over resources will be transferred automatically from the private to the public sector.

The appropriate procedure, if avoiding the automatic increase in average tax rates is the objective, is the Canadian system of widening all bracket limits and exemptions by a proportion equal to the rate of inflation. This has the effect of holding the real value of the tax brackets and exemptions constant and prevents taxpayers from moving from one bracket to another unless their real incomes change. An alternative scheme is to hold the bracket limits fixed, but to lower the tax rates applied to these brackets automatically. This is an inferior procedure. It would not prevent a low income family from suddenly being taxed as inflation pulls its nominal income above its exemptions. Neither would it prevent a middle income taxpayer from having his average tax rate pulled up sharply as a result of a movement into a higher bracket, in contrast to the high-income taxpayer who suffers very little change in his average rate since he merely moves upwards in the open-ended bracket at the top of the income ladder.

Indexing of the bracket structure as described above would be essential in eliminating inflation-caused distortions, but additional tax reforms would also be needed. The most conspicuous of these relate to the tax treatment of capital gains and to the taxation of interest income.

An individual who purchased an asset worth one dollar ten years ago, and who finds that the market value of the asset has risen by x percent must, if he disposes of the asset, declare $x/2$ as taxable income. If prices have risen by more than x percent over this interval, so that a real capital loss has in fact been sustained, this fact is ignored by the present tax system. Taxes must be paid on the nominal capital

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gain, even if the real gain is negative. In a properly indexed tax system only real capital gains would be taxed.

One of the worst problems, certainly from the standpoint of low income savers, is the treatment of interest income. Small savers do not have the financial resources or the expertise to avail themselves of the full scope of the capital market. Often they are limited in their saving opportunities to non negotiable government saving bonds, to saving and loan shares, and the like. All such assets fare poorly during inflation because the interest rate received on these assets is fixed or regulated by law. For example, in 1974 a small saver might have received 5 percent interest on his saving account, and while the thrift institution that held his deposit might have wished to pay higher rates to attract additional deposits, it was prevented from doing this by banking regulations. Meanwhile, the actual rate of inflation billowed up to 12 percent, so this small saver found himself losing ground in real terms at a rate of seven cents on each hard earned dollar of saving. Then, to add insult to injury, he had to pay income tax on the nominal 5 cents interest that he earned. One wonders, under the circumstances, why people of modest means bother to save at all. Proper inflation correction would tax only on the basis of a real interest rate defined as the nominal rate of interest that prevails in the market place minus the annual rate of inflation.

To sum up: An inflation corrected or indexed tax is one whose real revenue yield and progressivity is independent of the rate of inflation. Put differently, if a tax is fully indexed the average rate of tax for individuals or firms will remain unchanged if the real value of the base of the tax remains unchanged. This means as well that in the aggregate the average rate of tax would remain constant, and the share of national income yielded by the tax would remain fixed.

III. SCOPE OF THE PRESENT ANALYSIS

It is fair to say that in past years proposals to index income taxes would have been regarded as irresponsible concessions to inflation and would, therefore, have evoked little but derision from the majority of knowledgeable economists. But times have changed and the issue is now receiving serious attention and debate in recognition of two essential facts. The first is that the inequities caused by the existing tax structure under conditions of steady and substantial inflation, cannot be permitted to go uncorrected. The second is the realization that the impact of income taxation on economic activity is considerably different and more complex than it is depicted in conventional economics textbooks. The implications of the second of these realizations is what this paper attempts to explore.

The controversy over whether or not to index the income tax divides itself into three broad questions. First, there is the question of equity and a socially desirably distribution of income. Would inflation indexing of the income tax reduce the extent to which income is arbitrarily and unfairly redistributed by inflation?

The second question is the issue of the size of the public sector. The progressive rate structure implies that inflation raises the overall average rate of tax (even with fixed real income), and this means that the national income is redistributed from the private toward the government sector. Conservatives have been greatly disturbed by this characteristic of the revenue system. They protest that the unindexed tax structure supplies government with an "inflation bonus" of additional revenue, and that politicians are quite likely to develop a taste for inflation because the added revenue it yields averts the necessity of voting for politically unpopular discretionary tax increases to finance new and expanded expenditure programs.

Against this view is the liberal position that Congress finds it difficult to raise taxes and that the high responsiveness (or elasticity) of the revenue system with respect to both real and nominal income growth is the salvation that generates the revenues that finance growing social needs. Such persons feel that the "fiscal dividend" which is provided by growth of revenue should be preserved to make room for new initiatives. Indexing of the income tax would eliminate that part of the dividend that arises from inflation (although it would not eliminate that part that arises from real economic growth), and would therefore narrow the scope for the expansion of government services.

The third major issue is that of economic stability. Is it desirable to have the aggregate tax rate rise automatically in response to inflation, or does this produce harmful effects that had better be eliminated by indexing? The traditional macroeconomic arguments against indexing of the income tax assert that indexing will contribute to secular inflation as well as to cyclical instability. It is suggested, first, that under conditions of more or less permanent excess demand

and inflation, and without any compensating changes in other policy variables, indexing of the income tax will raise the secular rate of inflation because it implies a lower level of personal income taxation and therefore higher consumer demand. Second, since indexing lowers the marginal rate of tax on money income, it will reduce the ability of the personal income tax to act as an automatic stabilizer. The Canadian Royal Commission on Taxation stated this conventional view quite positively when it said that—[1]

> No attempt should be made to adjust the tax structure automatically for changes in the purchasing power of money. To develop a tax system that taxed only incomes in "real" purchasing power would irreparably damage the built-in stability of the system.

On the other side there is a pessimistic opinion which views an automatically rising aggregate tax rate as no protection against inflation because government allegedly can be counted on to spend its revenues. A more serious consideration in the light of contemporary conditions is the view that because of supply shocks such as increased oil and food prices, the price level may rise for reasons that are unrelated to excessive aggregate demand, and it might therefore be inappropriate for the budget to become restrictive in response to price level increases that are due to such causes. A third problem—one that is recognized as of great importance in most European countries, and whose potential importance in the United States should not be underestimated—is that automatically rising personal income taxes may not have the desired restraining effect on the price level because workers will respond to the higher taxes by demanding higher wages. If there is such a tax-wage push, the progression of the tax system with respect to money income may cause considerable trouble because a rise in taxes accompanied by a wage push could lead to a restriction of output and employment without having a significant effect on the rate of inflation, producing instead a condition of "stagflation." Fourth, even where the source of inflation is excess demand, problems that could be remedied by indexing may arise because the price level response to demand changes often lags behind the real output response. Because of this lag, money income and the aggregate tax rate may continue to rise even after real income and employment have begun to decline. Consequently, output and employment may be depressed at a time when aggregate demand is no longer excessive. Finally, and this may become increasingly important in the future, it is very likely that when personal taxes grow more rapidly than wages it will be difficult or impossible to get wage earners to accept a productivity-based incomes policy. Such policy presumes an agreement between groups in society to content themselves with pre-existing relative income shares. However, when the government imposes taxes in such a way as to raise its share of national income, it does not keep its part of the bargain, and labor may then attempt to offset the progression effect by insisting on wage demands that exceed the growth of productivity.

From the foregoing it appears that the subject of indexing of the personal income tax is a vast one. Fortunately, it can be trimmed down somewhat by appealing to actual experience in the United States since World War II. The first fact is that the equity effects of inflation on the tax structure appear considerably worse in theory

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[1] *Report of the Royal Commission on Taxation* (1966), p. 23.

than they have in fact been in practice. In part this is because different inflation caused distortions tend to offset each other. For example, high income taxpayers will not suffer much of an increase in their average rate of tax due to inflation if they are already in the highest bracket. But on the other hand such persons will be the main victims of the practice of taxing nominal capital gains. The net effect of these inadvertent offsets is that the progressiveness of the income tax is maintained and that the overall effect of inflation does not, contrary to the usual claims, appear to be regressive. According to Sunley and Pechman—[2]

> Inflation has the greatest relative impact on tax liabilities at the lowest end of the income scale. However, the increase in effective rates and the percentage reductions in income after tax indicate that the effect of inflation is much more uniform by income class.

Furthermore, Congress has changed the income tax at various times and these changes, too, have helped to offset effects on the distribution of income as well as the size of the public sector. According to Gramlich—[3]

> * * * Congress has over the post-war period periodically adjusted income tax rates so as to prevent average effective tax rates from rising in response either to inflation or to economic growth.

Gramlich's point is an important one that merits elaboration. Since 1950 the proportion of total Federal taxes to GNP exceeded 20 percent only in 1968 following the imposition of the surtax, and in 1969 following the further addition of higher social security taxes. With the exception of these two years, Federal taxes have remained below 20 percent of GNP. They have, therefore, generally been reduced before the progressivity of the personal income tax was able to raise the ratio of taxes to GNP above 20 percent.

The findings of Pechman and Sunley with respect to income distribution, and the historical fact that the relative size of the Federal government sector has shown no sign of increasing for at least a generation, would appear to deflate the importance of the first two of the arguments upon which the case for indexing is usually based. Gramlich makes the point in the following manner: [4]

> . . . since historical experience has shown that rates do get automatically adjusted to maintain roughly constant real income tax revenues, the question to be addressed is whether it is better to have an automatic formula adjustment stabilizing real tax rates in inflationary times, or whether it is better to have these adjustments made by Congress in a discretionary manner.

Whether Congress makes the adjustment once every two or every four years, or whether the correction takes place automatically and continuously, makes only a small difference when the issue is the distribution of income, and it makes no difference at all when the issue is the size of the government sector. Where the distinction does make an important difference is in the handling of short run stabilization policy. If such policy fails to respond rapidly and correctly in response to various shocks, the consequences can be devastating. Since discretionary fiscal policy demonstrably operates with a sizeable lag, it

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[2] Emil M. Sunley, Jr. and Joseph A. Pechman, "Inflation Adjustment for the Individual Income Tax," Brookings Conference on Inflation and Income Taxes, October 1975, p. 5.
[3] Edward Gramlich, "The Economic and Budgetary Effects of Indexing the Tax System," Brookings Conference on Inflation and the Tax System, October 1975, p. 10.
[4] Edward Gramlich, *op. cit.*, p. 13.

is all the more important to design automatic policy responses in an optimal manner. The basic question comes down to whether it is best to respond to inflation (whatever its cause) with an automatic response that raises the aggregate tax rate, as is the case with the present system, or whether it is best to have a neutral response that keeps the aggregate tax rate constant and maintains proportionality between taxes and personal incomes when the price level changes.

IV. INDEXING AND STABILIZATION POLICY

A. Restrictions in Aggregate Commodity Supply

Most economists have been brought up on the idea that progressive taxation of nominal incomes contributes to economic stability. In recession taxpayers slide into lower brackets and this stabilizes disposable income and consumption, and this prevents GNP from falling more than would otherwise have been the case. Similarly, during an inflationary period, the disproportionate rise in taxes once again stabilizes disposable income and this, in turn, holds back consumption and moderates the inflation.

This standard view tells only a very small part of the story. In particular, it fails to recognize the possibility that prices and real income may move in opposite directions. When that happens, as was not generally anticipated by economists only a few years ago but has now become commonplace, progressive taxation of nominal income becomes destabilizing. Edward Gramlich comments: [1]

> . . . in the brave new world we appear to be entering where changes in the international parity of the dollar, the formation of raw materials cartels, and world food shortages can cause sharp bursts of 'exogenous' inflation, it may be inappropriate to let real tax levels rise, and the budget become more restrictive, in inflationary times.

As the passage from Gramlich suggests, the vividness of recent experience, recalling oil embargos, skyrocketing fuel prices, and other misfortunes, has caused many commentators to attribute the combined fall in output and rise in prices of 1974 to so-called "exogenous" shocks. It should not be forgotten however that the sources of such non-demand induced inflation are in the general category of restrictions of aggregate supply. Such restrictions may come about, as they did in 1974, from the continuation of poor world harvests and from the actions of the OPEC cartel. But they may also come about if labor supply, for some reason, is reduced. Indeed, and as described in the next section, such restriction might quite possibly come about as a *direct consequence of higher income taxation* and in that event there might be nothing at all exogenous about such restriction.

Generally, supply restrictions contain cost push elements that have the effect of simultaneously reducing output and pushing up the price level. The danger is that policy makers will misunderstand the cause of the inflation. If attention is paid only to the rising price level while the fall in output is ignored, and if restrictive measures are therefore adopted, output will shrink even more. This is the sorry story of 1974, a year which witnessed one of the sharpest and deepest collapses ever experienced by the American economy. Although it was not the first time that output fell while prices were rising, it did represent the most striking example of those frustrating periods that have come to be called stagflation.

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[1] Edward Gramlich, *op. cit.*, p. 14.

The rate of inflation in 1974 was 12.2 percent as measured by the consumer price index. Some of this rise, to be sure, was attributable to the momentum of the world commodities boom of 1972–73, as well as to the very rapid increase in U.S. exports which followed the devaluations of the dollar. Nevertheless, very few competent analysts would seriously claim that the economy of 1974 was characterized by excessive demand. The consensus, rather, is that the inflation was largely attributable to such special factors as oil prices and the poor harvests that continued to plague the world's agriculture. Both of these factors originated on the supply side and therefore had the effect of raising the price level for reasons that were unrelated to excessive aggregate demand.

Oblivious to the source of inflation, both discretionary and automatic fiscal policy became sharply restrictive. This is shown in Table 1, where the developments from the fourth quarter of 1973 to the third quarter of 1974 are recorded. The table shows that while real GNP fell steadily during this period, the GNP deflator rose at an annual rate of 11.1 percent and that nominal GNP and nominal personal income therefore both increased substantially despite the fall in real GNP.

TABLE 1.—SELECTED NATIONAL INCOME DATA

[In billions of dollars]

	Quarterly totals at annual rates				Annual rate of growth 1973–IV to 1974–III
	1973–IV	1974–I	1974–II	1974–III	
In current prices:					
GNP	1,355.1	1,372.7	1,399.4	1,431.6	7.6
Personal income	1,095.5	1,109.7	1,136.8	1,172.5	9.4
Federal personal tax and nontax payments	120.3	124.0	129.1	134.3	15.8
Disposable income	937.7	948.4	969.5	998.0	8.7
Consumption	833.1	853.3	878.7	906.8	12.0
Personal saving	81.1	72.6	67.8	67.6	−21.6
In constant 1972 prices:					
GNP	1,242.6	1,230.4	1,220.8	1,212.9	−3.2
Personal income	1,006.9	990.8	985.9	988.7	−2.4
Federal personal tax and nontax payments	110.6	110.7	112.0	113.2	3.1
Disposable income	861.9	846.8	840.8	841.5	−3.1
Consumption	765.9	761.8	761.9	764.7	−.2
Personal saving	74.5	64.8	58.8	57.0	−30.0
Deflators (1972=100):					
GNP	109.1	111.6	114.6	118.0	11.1
Personal consumption	108.8	112.0	115.3	118.6	12.2
Ratios:					
Saving to disposable income	8.6	7.7	7.0	6.8	----------
Personal taxes to personal income	11.0	11.2	11.4	11.5	----------

Source: U.S. Department of Commerce, Survey of Current Business.

As a result of the rising nominal personal income, Federal income tax yield rose even more rapidly, the growth of revenues from $120.3 billion to $134.3 billion representing an annual rate of 15.8 percent. Because of this differential growth, the ratio of Federal personal taxes to personal income increased a full half percentage point (from 11.0 to 11.5) percent in less than a year, and *during a period in which real GNP was falling*. This is one of the troubles with an unindexed income tax: The aggregate income tax rate rises as long as nominal personal income rises, rather than as long as aggregate demand is excessive. The consequence in 1974 was to convert the income tax into an automatic destabilizer.

How would the situation have differed had income taxes been indexed? Over the interval 1973–IV to 1974–III the growth of Federal personal tax and non-tax receipts was $14.0 billion. Inflation indexed income taxes would have produced the following results.[2] The reduction in real GNP would have caused nominal receipts to fall $3.5 billion. The rapid rise in prices, however, would have pushed receipts up by $10.8 billion, and the net increase in receipts would therefore have been $7.3 billion. Since the unindexed tax system yielded an increase of $14.0 billion, the net difference is $6.7 billion.

The $6.7 billion is not a vast amount but it is the difference between automatic stability and automatic instability. Instead of rising from 11.0 to 11.5, the ratio of taxes to personal income would have fallen to 10.9 percent had taxes been indexed. There is no doubt therefore, that indexed taxes would have moderated the collapse of 1974.

B. Restriction of Labor Supply

The events of 1974 showed that the so-called exogenous factors could produce a simultaneous occurrence of rising prices with falling output. This and the next section show that such a condition of stagflation can readily occur without any outside help but may rather be inherent in the structure of the economy. The discussion also attempts to show that indexing of the income tax will alleviate that condition.[3]

In recent years there has been a considerable amount of concern expressed—especially in European countries—over the importance of income taxes in influencing wage behavior. Econometric analysis of wage determination for individual countries often exhibits positive correlation between money wage rates and wage taxes, and some governments have shown considerable concern over what they perceive as a threat of wage retaliation against higher personal taxation.[4]

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[2] These estimates were obtained as follows. When dealing with the progressive income tax it is usual to assume a function of the form,

$$T=\alpha\, p^{\beta}\, X^{\gamma}$$

where T is nominal yield from the tax, p is the deflator for personal consumption expenditure, and X is real personal income measured in 1972 prices. When taxes are unindexed and related purely to nominal income, $\beta=\gamma$, and the tax function can then be written,

$$T=\alpha(px)^{\gamma}=.001426(px)^{1.621}$$

where pX is nominal personal income, and the numerical coefficients are derived directly from the data for the fourth quarter of 1973 and the third quarter of 1974. This equation, therefore, is consistent with the increase in taxes of $14.0 billion that actually took place over the interval, and it implies an elasticity of tax with respect to nominal income of about 1.6.

In an indexed tax system the elasticity of nominal tax with respect to the price level would equal unity. Therefore, setting $\beta=1$, we calculate the effect of inflation alone on tax yield as,

$$dT=\beta(dp/p)\,T=1.0(.09007)\,(120.3)=\$10.8 \text{ billion.}$$

Similarly, the effect of the fall in real income by itself is,

$$dT=\gamma(dX/X)\,T=1.621(-0.01815)\,(120.3)=-\$3.5 \text{ billion.}$$

The net change in nominal tax that would therefore have been obtained in an indexed system is the difference of $7.3 billion, as compared with the change that actually took place of $14.0 billion.

[3] The analysis of this section draws heavily on the author's paper, "The Macroeconomic Implications of Wage Retaliation Against Higher Taxation," International Monetary Fund *Staff Papers,* November 1974. See also A. S. Blinder, "Can Income Tax Increases be Inflationary? An Expository Note," *National Tax Journal,* June 1973.

[4] The tax-wage interactions in various countries are discussed in a variety of sources, many of them governmental. The Swedish experience is discussed by Assar Lindbeck, "Theories and Problems in Swedish Economic Policy in the Post-War Period, *American Economic Review,* June 1968, Supplement. The impact of heavy wage taxation on wage behavior in the United Kingdom is analyzed by Dudley Jackson, H. S. Turner, and Frank Wilkinson, *Do Trade Unions Cause Inflation,* Cambridge, 1972; Some econometric evidence for the United States is provided by Robert J. Gordon, "Inflation in Recession and Recovery," *Brookings Papers on Economic Activity,* 1971.

Indeed, in some countries wage bargaining appears to be more a negotiation between unions and government than between unions and employers. So-called stabilization agreements involve a promise by government to hold down taxes and public expenditure, in return for which unions promise to exercise wage restraint.[5]

Although this kind of problem sounds inapplicable to the United States where unions are not powerful enough to threaten government with wage retaliation against higher taxation, there is nevertheless some evidence that a rise in income tax (because it lowers net wages after tax) reduces aggregate labor supply. Similarly, a fall in income taxes is likely to have the opposite effect.

The tax reduction of 1964 was followed by a slowing down in the rate of wage increase, and the subsequent very rapid expansion of the economy was aided by the resultant reduction in unit labor costs. In 1968 the opposite happened. Taxes increased and wage pressure mounted; unit labor costs rose sharply, and the economy performed very poorly after the imposition of the surtax. While these episodes do not prove the validity of the present hypothesis, they are nevertheless quite consistent with it. And this is, after all quite reasonable. To the worker what counts is his net income after tax—his disposable income—and he may very reasonably view a tax reduction as a substitute for a wage increase and vice versa.

Such a tax-wage interaction considerably changes the standard theory of the effect of taxation on the economy. That theory suggests that a rise in taxes will reduce aggregate disposable income and consumer expenditures, and that this will lead to a fall in employment and a fall in the price level. However, if the tax increase is accompanied by a wage increase, the following additional things will happen. The wage increase will raise the production costs of business and lead to a reduction in output. The reduction in output implies a reduction in real income and this leads to a reduction in consumption. However, since consumption normally falls by less than the fall in income, the net result is excess demand in commodity markets and a consequent rise in the price level. This rise in the price level then reduces the real quantity of money, raises interest rates, and this then curtails aggregate expenditure and reduces the level of employment.

The tax increase lowers employment and the price level. The wage increase also lowers employment but raises the price level. Therefore if wages rise when taxes are increased, this will magnify the extent to which employment falls because the tax and the wage increase both operate in the same direction. However, the downward pressure on the price level will tend to be neutralized if the tax increase is accompanied by a wage push because the price level effects of the two changes are in the opposite direction. It might, indeed, be possible for the wage push to be so strong that the price level rises.

These considerations imply that increased taxation is very likely to be an inefficient instrument of inflation control. Because of the wage push that accompanies the rise in taxes, any favorable price level effect that the policy produces will be accompanied by such enormously adverse side effects on employment that a strong presumption is created in favor of utilizing different policy instruments

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[5] For a description of such a stabilization agreement see the OECD *Economic Survey* for Finland, Paris 1973. More recently, the government of the United Kingdom has proposed income tax reduction in return for a moderation of wage demands.

for inflation control purposes. There is, in particular, a presumption that those instruments that do not carry with them a built in wage push factor will be far more efficient in inflation control.

If the foregoing argument is valid, it provides a very strong additional case for indexing the income tax. As nominal income rises and as the real value of taxes rises automatically due to the progressivity of the unindexed tax, the wage push mechanism is set in motion. Employment then declines without much gain against inflation. This certainly ought not to be permitted to happen automatically, inasmuch as that implies a built in mechanism that automatically creates a bias towards higher unemployment and rapidly rising wages as well. It would be far better to have a neutral tax system—one that maintains a constant aggregate tax rate in response to inflation—since that would prevent the adverse responses discussed here from being set off.

C. Differential Lags in the Adjustment of Output and Prices

Despite the usual assumption, it is not correct to say that stagflation can come about only because of disruptions on the aggregate supply side. A simultaneous rise in unemployment and prices could also be brought about if these two variables reacted to changes in aggregate demand with time lags of different length. Econometric models of industrial countries generally have the characteristic that a change in aggregate demand tends to produce prompt adjustment in real economic activity, while price level adjustments tend to be delayed and distributed throughout the future. This property certainly appears to characterize the econometric models of the United States.

The Canadian economists, John Bossons and Thomas Wilson,[6] have observed that these differential lags in adjustment, when combined with a progressive unindexed income tax system, cause that tax system to be a potential source of instability. For example, if taxes were increasing rapidly in response to an inflation which was caused by excessive demand at some time in the past, and if demand were not presently excessive, the result would be to depress the economy.

Bossons and Wilson pursued the implications of these differential lagged responses for the economy and for the tax system with the aid of simulations of the Canadian economy using the University of Toronto's quarterly forecasting model. They subjected the economy to an expansionary shock in the form of a $500 million increase in exports that was sustained from the first through the fourth quarter of 1965, and the impact of this demand increase was then traced over subsequent time periods extending through the fourth quarter of 1969. The simulations compared the effects of the shock as it would have manifested itself under a system in which tax brackets and personal exemptions are widened at the growth rate of the price level.

The results of the simulations are shown in Table 2, where they are expressed as annual averages of the quarterly values reported by the authors. Columns (1)–(4) show the effects on income tax yield; columns (5) and (6) report the percentage changes in the consumer price index; and columns (7) and (8) show the associated percentage

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[6] John Bossons and Thomas A. Wilson, "Adjusting Tax Rates for Inflation," *Canadian Tax Journal,* May–June 1973.

changes in real GNP. The data for a particular year should be interpreted as the excess or shortfall of the variable in question over the level it would have attained if the expansionary shock had not taken place—that is, over the control solution.

TABLE 2.—UNIVERSITY OF TORONTO QUARTERLY FORECASTING MODEL: EFFECTS OF $500,000,000 EXOGENOUS EXPENDITURE INCREASE IN 1965, ON SELECTED VARIABLES

	Change in income tax yield				Change in consumer prices (percent)		Change in real GNP (percent)	
	Unindexed							
	Total	Due to change in real income	Due to change in price level	Indexed	Unindexed	Indexed	Unindexed	Indexed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year:								
1965	81	80	1	81	0.01	0.01	1.33	1.33
1966	120	66	54	119	.57	.57	.75	.75
1967	179	29	150	148	1.39	1.39	.28	.32
1968	214	−9	223	153	1.73	1.77	−.07	.06
1969	270	−43	313	191	1.91	2.00	−.26	−.06

Source: J. Bossons and T. A. Wilson, "Adjusting Tax Rates for Inflation," Canadian Tax Journal, op. cit., tables 3, 4, and 5.

As is evident in column (5), the expansionary shock produced almost no additional inflation in the first year, so that the entire revenue effect was the result of the rise in real income shown in column (7). In the second year (1966), the exogenous demand boost was removed, so that real GNP tended to move back toward its control level and the additional taxes induced by real income change were therefore less than in 1965. However, by this time the price level began to rise, inducing a revenue increase of $54 million in excess of the control level. Therefore, in combination, the real income and price level changes continued to raise tax revenue. In the third year, real income and the taxes induced by real income changes moved still closer to the control level, but total taxes continued to rise because the rate of inflation continued to rise. By the end of 1967, the real income stimulus was entirely dissipated, but taxes continued to rise because of a still rising rate of inflation. At this point, real output fell below the control level, and the tax yield associated with real income changes became negative. This unfavorable development occurred because the rising price level continued to raise the average aggregate tax rate, with the consequence that consumption, and therefore real income, were depressed below the control level. Since the inflation rate continued to rise into 1969, there was a further depressing impact in that year.

Indexing of the income tax makes no difference in the first two years because the delayed response of the price level, as well as the lag in adjusting the tax system for price changes, prevented the indexing scheme from having any effect. In the third year, however, taxes were substantially lower because of the operation of indexing, with the result that real output was higher than it would have been in the absence of indexing. The continuation of inflation in the subsequent two years produced a further widening between tax receipts under the alternative tax systems, and this helped to moderate the depression of output below its control level, although it did not eliminate it entirely. The indexed tax system therefore exercised a stabilizing effect on real output.

The rate of inflation proved to be only slightly higher as a result of tax indexing. But, as can be seen by comparing columns (5) and (6), this did not manifest itself until the fourth year, and even in the fifth year the difference between the shock-caused inflation rates was only about one tenth of one percentage point. Given the fact that the $500 million increase in exports represented a sizeable disturbance to the Canadian economy, this rather nominal increase in the rate of inflation does not seem excessively large in terms of the gains in output and employment that were realized.

V. POLICY ISSUES FOR THE NEAR FUTURE

The previous portions of this paper provided the economic basis for a restructuring of our system of personal income taxation. In this Part an effort is made to draw these considerations more closely to the fiscal policy problems that will confront the American economy to 1980 and beyond.

A. Incomes Policy and Superindexing

Despite the fact that there has not, since the end of 1973, been substantial evidence that the economy is suffering from excessive demand, the price level continues to rise at a disturbing rate. Most forecasts, moreover, suggest that the annual rate of price increase will be at least 5 percent until 1980.

The continuation of inflation throughout the foreseeable future is likely to prevent the goal of full employment from being reached. In part, the goal is doomed because rising prices and rising nominal incomes automatically move the budget toward restriction, and because rising prices reduce the real value of the money supply and make for automatic monetary tightness, even as the monetary authorities proclaim how easy monetary conditions are. Worse still, the continuation of inflation provides policy makers with a perennial pretext for timidity in the formulation of economic policy. Since standard lore prescribes diametrically opposite policy responses to unemployment and inflation, there is a tendency to do nothing when both problems persist simultaneously.

How is this impasse to be resolved? What seems now to be developing is a change in sentiment that favors a return to some form of administrative wage-price guidelines of the sort conducted by President Kennedy in the early 1960's and of the kind known in Europe as "incomes policy."

If another try at incomes policy is to be the way of reconciling full employment and stable prices, we had better make certain that our economy is structurally designed in a way that will provide the incomes policy with a fair chance to work. Agreements governing the rate of wage increase have tended to break down at an alarmingly rapid rate wherever they have been tried.[1] When aggregate demand is excessive they tend to be repudiated by labor or to be rendered effectively inoperative by wage drift. They cannot, moreover, withstand the impact of sharply increasing costs of imported foods, fuels, and the like. They are sensitive, in short, to any factor that disrupts the agreed upon path of real wages.

In view of this, a factor that is very likely to militate against the successful implementation of incomes policy is the system of progressive taxation of wages and salaries. As is well known, when labor

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[1] For a survey and comprehensive bibliography on incomes policy see Ann Romanis Braun, "Three Decades of Incomes Policy: Reflections on the Role of Incomes Policies in Industrial Countries, 1945–75", International Monetary Fund *Staff Papers,* March 1975.

accepts a rate of wage increase equal to the rate of growth of output per man-hour, this implies constant unit labor costs and therefore prevents cost pressures from influencing the price level. At the same time, acceptance of such a productivity guidepost implies that the relative share of wages and profits in the national income will remain the same. It is when the major groups in the society cannot agree to maintain the stability of their relative shares, that wage-price competition introduces cost-push elements that tend to be unrestrained as long as the government maintains a level of aggregate monetary demand that is adequate to prevent unemployment from rising.

It is paradoxical that the government, which is called upon to moderate the adverse employment consequences of aggressive wage behavior, may itself be one of the causes of such aggressive behavior. The reason is that progressive taxation of incremental national income is incompatible with the constant relative shares concept to which the government is seeking compliance.

Consider the following numerical example. A wage earner with an hourly earning of $10 who is taxed at an average rate of 20 percent has an hourly take-home pay of $8.00. If productivity grows at a rate of 5 percent, and the wage earner's nominal wage also grows by 5 percent, his gross wage rises to $10.50. If the 20 percent rate applied to his income is also applied at the margin, his net income will rise to $8.40, which exactly amounts to a 5 percent increase. If profits are also taxed proportionately at the margin, the relative shares (defined as profits after net taxes, wages after net taxes, and net taxes) will remain constant.

On the other hand, if the same worker is taxed at a rate of 50 percent on his incremental income, he will get to keep only 25 cents out of a gross wage increase of 50 cents so that his net income gain comes to only 3.13 percent. A disproportionate fraction of the productivity gain is siphoned off by the government which, precisely because it is taxing progressively at the margin, is in violation of the very productivity-based incomes policy to which it is seeking compliance. In order to realize an increase in his net income of 5 percent, the wage earner would have to receive an increase in his net wage of 40 cents. With a marginal tax rate of 50 percent, this implies an increase in his gross wage of 80 cents or a percentage increase of 8.0 percent which, of course, is 60 percent above the productivity guideline. Consequently, competition for relative income shares may be initiated by a preexisting tax structure that is incompatible with the social agreement implicit in the incomes policy. Such a situation lends further support to the conclusion that the standard personal income tax could quite easily provoke behavior that may make inflation more, rather than less, difficult to control.[2]

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[2] A bit of generalizing may be helpful. If w is the after tax wage, then $w=y-t$, where y is the before tax wage, and t is the tax. It can then easily be shown that,

$$dw/w=(dy/y)\left[\frac{1-dt/dy}{1-t/y}\right]$$

where dt/dy is the marginal tax rate and t/y is the average rate. Clearly, when the marginal rate of tax exceeds the average rate, post tax income grows less rapidly than pretax income. The only way to assure the worker of his share of productivity growth is to make the marginal and the average rates equal.

Although indexing of the income tax would be a significant step in the right direction, it is important to note that it would not solve the relative shares problem as long as the economy enjoys real economic growth. A personal income tax that is compatible with a productivity-based (fixed shares) incomes policy implies that incremental aggregate income, whether real or nominal, should be taxed at the same rate as the average rate on preceding income. Indexing only ensures that incremental nominal income due to price inflation is taxed at the previous average rate; it does not, however, eliminate the potentially disruptive effects on the incomes agreement of the high marginal rates on real income.

This circumstance suggests that serious consideration might well be given to schemes for per capita income growth indexing. Under one such proposal, incremental per capita nominal income (whether due to real or price factors) would be taxed proportionately so that the relative shares of income, including that of the government, automatically remain constant. Such a proposal might aptly be described as "super-indexing" since it offsets both the effect of inflation and the effect of average real national economic growth on the average tax rates of individuals. Superindexing keeps the aggregate tax rate constant, and fixes the government's share of the national income and it therefore entirely offsets fiscal drag.[3]

Care must be taken not to confuse inflation indexing, or super-indexing, with proportional taxation. The latter simply taxes all income at a constant rate. Superindexing, on the other hand, taxes individual income growth that is equal to the national average per capita income growth proportionately. However, growth of individual income in excess of this would have a higher marginal rate applied to this additional growth, whereas incomes growing less rapidly would be taxed at a lower marginal rate. The tax system would remain progressive because high-income taxpayers would continue to pay a larger fraction of their income than low-income taxpayers. On the other hand, their average rates and relative positions in the distribution of after-tax income would remain unchanged if all their incomes grew at the national average rate of increase in nominal per capita income.

Indexing of the personal income tax relative to the trend of per capita income growth (superindexing) asks the tax structure to respond progressively to changes in individual income relative to the trend of per capita growth of income, rather than to changes relative to the absolute nominal income of the taxpayer. This approach would carry with it several advantages. Fiscal drag would be eliminated. The tendency for the budget to become automatically more restrictive would be averted. Productivity-based incomes policy would be given a far better chance of gaining support and compliance. The average aggregate tax rate could no longer rise during a period when real income is constant or falling. The policy, moreover, would not interfere with the traditional aim of using the personal income tax as a means of producing greater equality of income, nor would there be any limit to the use of tax policy as a discretionary instrument of stabilization policy. While brackets and exemptions would be expanded automatically under a system of indexing, there is no apparent reason why discretionary policy could not simultaneously vary the rates applied to these brackets in accordance with the needs of current policy.

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[3] For a detailed discussion of a superindexing proposal see Vito Tanzi, "A Proposal for a Dynamically Self-Adjusting Personal Income Tax," *Public Finance,* 1966.

B. Revenue Effects of Alternative Tax Policies

An examination of the revenue effects of various tax policies will provide some perspective of their quantitative importance. Fortunately, such estimates were made in a recent study by the staff of the Senate Budget Committee [4] and need not therefore be generated anew.

To control for the effect of national income on revenue, the Budget Committee's staff based its estimates on the assumption of full employment. The full employment GNP path was assumed to grow at a real rate of 4 percent, and after fiscal year 1976, the price level was expected to continue to grow at an annual rate of about 5.25 percent.

Full employment Federal personal income tax revenue in fiscal year 1976 was estimated to be $159 billion on the assumption that the 1975 tax reductions would be extended throughout the year. This figure implied a ratio of all Federal taxes to potential GNP of 19.6 percent.

If the 1975 tax reductions are made permanent but no further discretionary changes take place, full employment personal income tax yield will rise to $282 billion (an increase of $123 billion) in 1980 and because of the progressivity of the personal income tax, the ratio of all Federal taxes to potential GNP under this no-policy option will rise to 21.5 percent.

Simple inflation indexing of the personal income tax would imply Federal income tax yield of $252 billion in 1980. This would imply a revenue loss of only $30 billion, or 11 percent, relative to the no-policy option, and it would leave the ratio of all Federal taxes to potential GNP at a very high ratio of 20.4 percent.

The superindexing option would keep the ratio of all Federal taxes to potential GNP at its 1976 level of 19.6 percent. It would result in 1980 revenues of $233 billion, and therefore represent a revenue loss that exceeds the loss under inflation indexing by $19 billion, and a total loss of $49 billion relative to the no-policy option.

Given the circumstances that confront the economy at this time, none of these alternatives represents ideal fiscal policy *presuming that nothing else is done* between now and 1980. Both of the indexing programs are equivalent to small annual tax cuts of increasing magnitude. As a consequence, these tax policies are poorly timed. They provide very little in tax reduction in 1977 when the economy will be badly in need of stimulus and when the threat of excessive demand will be minimal; and they will tend to have their maximum impact in 1980 by which time full employment may be in sight and excessive demand may once again be a relevant problem. The Senate Budget Committee Staff concluded: [5]

> What is needed—is a tax program that will provide maximum stimulus when it is most clearly called for and that simultaneously prevents the long-range Federal share of full employment revenue from being eroded.

The staff proposed a $20 billion tax reduction (in addition to extension of the 1975 reduction) to take place January 1, 1976. It was estimated that this would have reduced full employment income tax revenue in 1980 to $246 billion, and left the ratio of all taxes to potential

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[4] "Long Range Fiscal Strategy," Committee on the Budget, United States Senate, October 1975, Chapter 8.

[5] "Long Range Fiscal Strategy," *Op. cit.*, p. 25.

GNP equal to 20.1 percent. Such a fiscal policy would therefore have caused a revenue loss of $36 billion in 1980. This would be greater than the $30 billion loss due to inflation indexing, but less than the $49 billion loss due to superindexing.

This policy would be superior because it provides stimulus when it is most needed, and also because it implies a restrictive budget in subsequent years when demand inflation may once again be a problem. It is clearly the preferred alternative *presuming that the various policies are regarded as mutually exclusive*. However, inasmuch as tax policies need not be mutually exclusive the case for indexing at this time is not destroyed or compromised. It is important only to bear in mind that the introduction of inflation indexing into the income tax will not eliminate the need for further carefully planned fiscal action. Indexing is a modest proposal that involves small revenue changes and that addresses itself only to the automatic portion of fiscal policy. It cannot be expected to solve all of the problems of fiscal policy, nor should it be blamed for all its failures.

C. Concluding Notes

The conventional argument favoring progressive taxation of money income, as opposed to an inflation-proof personal income tax, is based on considerations that reflect the effect of taxation on nominal income without distinguishing between the real and the price component of such a change, and without recognizing the fact that economic policy should aspire to several goals simultaneously. The possibility of wage adjustment in response to higher taxes, the possibility of exogenous shocks in factor and commodity supply, and the likely presence of delay in the response of prices to changes in aggregate demand, suggest that a rise in personal income taxes is not an efficient method of slowing the growth of the price level because of its powerful adverse side effects on output and employment. A relatively modest gain in slowing inflation, if brought about by higher taxes, will tend to be bought at a higher price in terms of lost production and employment than would be the case if restrictive monetary or some other policy free from wage push is used to effect the same reduction in the rate of inflation. In the view presented here, it is not advisable to permit the aggregate tax rate to respond automatically to a change in the price level, when the change in the tax rate, in turn, has little relative effect on the price level. Such a "missassignment" of instruments to targets is likely to produce stagflation. It is, in other words, apt to raise prices and to depress production and employment at a time when aggregate demand is not excessive.

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