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# The Administration's "Program for Economic Recovery": Theory and Evidence

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## ABSTRACT

The economic recovery program proposes to inject about $100 billion into the aggregate spending stream while simultaneously reducing the inflation rate. Careful analysis of estimates of the supply response to tax rate reductions and deregulation show that output increases will not balance the increased demand. Savings rates several times historic levels are thus necessary not only to reduce inflation, but even to prevent the program from worsening inflation. Recent evidence indicates that none of the scenarios most often mentioned as producing the requisite savings hold much promise.

# THE ADMINISTRATION'S "PROGRAM FOR ECONOMIC RECOVERY": THEORY AND EVIDENCE

Can reductions in personal tax rates increase output without contributing further to inflationary pressures? In large part, this is the promise of the new Administration's "Program for Economic Recovery." The package is of rather dramatic design - - across-the-board tax reduction coupled with sweeping budget cuts. However, the relative magnitudes of the tax and budget cuts being proposed appear to represent a net stimulus of roughly $100 billion over the 1982-1984 period.[1] When spending cuts are significantly less than tax cuts, additional developments must follow if the potential increase in aggregate spending is not to be inflationary. Two such developments are most often discussed.

The first is that the tax cuts will be saved. Given the magnitude of the stimulus involved, the non-inflationary savings rate out of tax reductions would have to be in excess of forty percent. If inflation is to be significantly reduced, the savings rate must be even greater. On this point, the architects of the package have been quite candid, speculating that one-half to two-thirds of the tax cuts will be saved.[2] Nonetheless, skeptics emphasize that traditional savings rates have been well below ten percent of disposable income. Though there is some basis for disputing this statistic, even revisionist estimates hardly approach the requisite savings rate.[3]

The second possibility is, of course, the supply response. Sharp increases in output can buffer increased spending and alleviate upward price pressure. To further this end, investment tax incentives are being recommended. However, capital stock expansion is not an instantaneous process.

Consequently, a significant share of the required output increase must occur before new investment has had time to augment the capital base. Moreover, such capital deepening requires extra savings up front to permit the requisite diversion of resources. Hence, this portion of the supply response is not only deferred beyond the short run period considered here, but is also dependent on the demand side response.

Real output growth has been hampered also by wasteful over-regulation of business. It follows then that the elimination of unproductive and thus costly regulation taps a reservoir of real output. However, like capital formation, the output response to regulatory reform may have its own special time dimension. Basic microeconomic theory suggests that the magnitude of a short run output response depends upon the distribution of compliance costs between variable and fixed components.

In the near term, therefore, perhaps output expansion relies largely upon increased labor force participation. Clearly, it is to this prospect that the proposed personal tax rate cuts are largely addressed. The logic is straightforward - - give individuals a larger after-tax share of what they produce and they may well produce more. Indeed, there is empirical support for this proposition.[4] Nevertheless, emphasis on the labor supply response to lower tax rates does not suspend their demand side implications. Keynesian policies have run into trouble for having ignored essential supply side considerations. Certainly advocates of supply side policies would do well to avoid simply inverting that error.

In short, if the proposed personal tax cuts are to be consistent with a reduction in inflation in the near term, there must be a swift and significant change in aggregate savings behavior and/or a commensurate short run increase

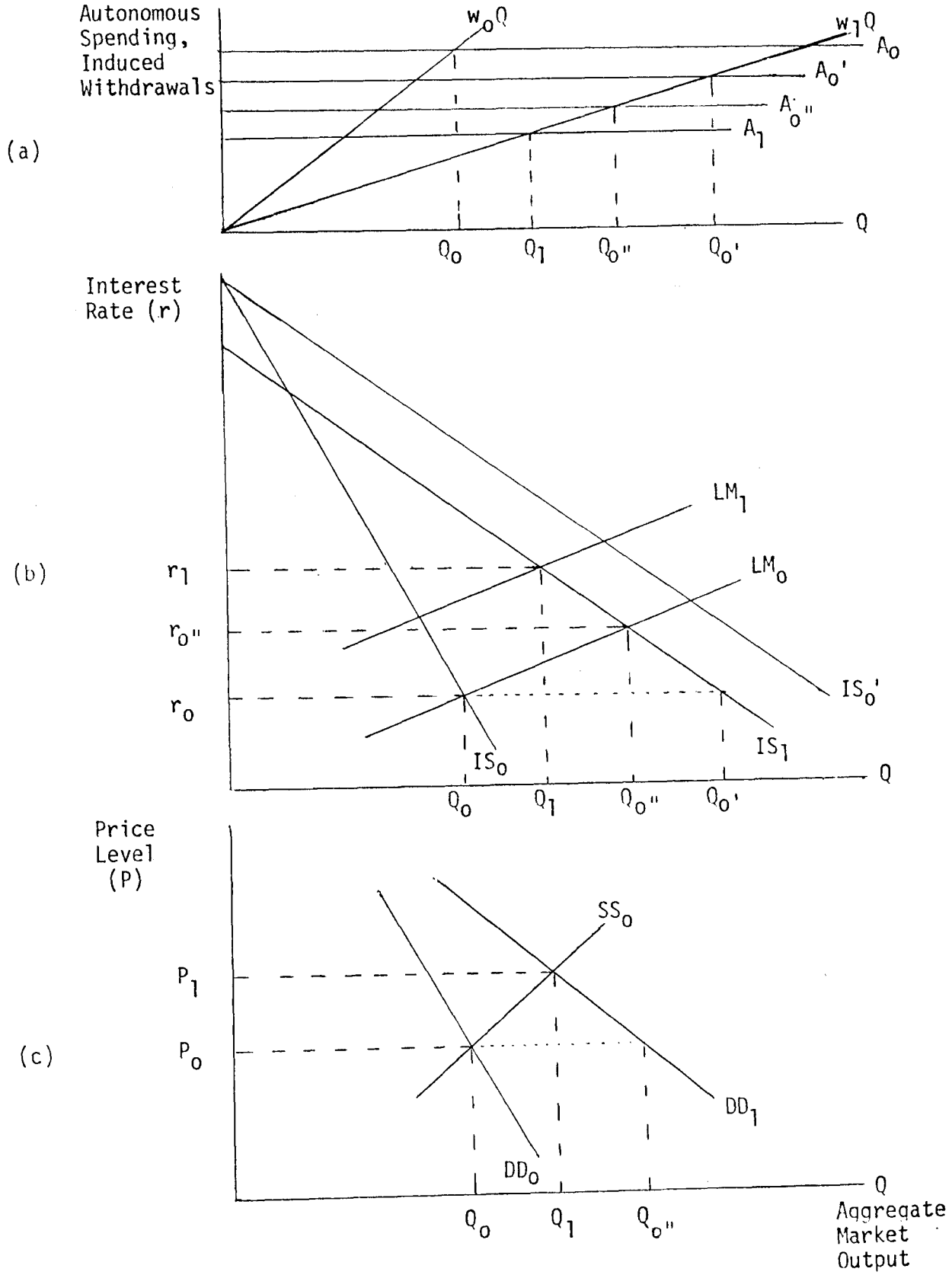
in real output. This paper examines the prospects for such short run developments. Part I models the inflationary potential of the net demand stimulus. Part II examines several scenarios under which a jump in personal savings might occur and thus forestall the prospect of tax-induced price pressure. Part III examines the impact which the proposed tax cuts can have on the supply side. This paper, by clarifying the nature of the supply response to the Administration's proposals, estimates the adjustment in aggregate savings necessary if the program is not to contribute to inflation.

## The Demand Stimulus

This section models the demand side response to across-the-board tax cuts coupled with a smaller federal spending reduction. The standard macroeconomic model provides a framework within which to highlight the various relationships which must change if the net fiscal stimulus is not to be inflationary.[5]

The attainment of equilibrium in the injection/withdrawal process is depicted in Figure Ia. The rate of withdrawal from current income is a function of the savings rate (s), tax rate (t), and import rate (m). The level of withdrawals (W) is the withdrawal rate (w) times real output (Q) where $w = \left[ s(1-t) + t + m \right]$. Injections (A) consist of planned investment, government spending, exports, and autonomous taxes and consumption. Figure Ib adds the money market and thus incorporates the effects of interest rates into the analysis. Figure Ic considers the role of price level changes. The short run aggregate supply curve (SS) is drawn positively sloped for the usual host of reasons.[6] Changes in aggregate demand (DD) thus influence the price level and real output.

FIGURE 1


(a)
Autonomous Spending, Induced Withdrawals
$w_0Q$
$w_1Q$
$A_0$
$A_0'$
$A_0''$
$A_1$
Q
$Q_0$
$Q_1$
$Q_0''$
$Q_0'$
(b)
Interest Rate (r)
$LM_1$
$LM_0$
$r_1$
$r_0''$
$r_0$
$IS_0'$
$IS_1$
$IS_0$
Q
$Q_0$
$Q_1$
$Q_0''$
$Q_0'$
(c)
Price Level (P)
$SS_0$
$P_1$
$P_0$
$DD_1$
$DD_0$
Q
$Q_0$
$Q_1$
$Q_0''$
Aggregate Market Output

The tax cut is shown in Figure 1a as a downward rotation of the withdrawal function from $w_o Q$ to $w_1 Q$. A simultaneous cut in federal spending reduces the level of autonomous injections from $A_o$ to $A'_o$. Combined, these fiscal measures move the economy to output level $Q'_o$. In view of the relative magnitudes of the tax and budget cuts cited previously, note that this depiction is qualitatively consistent with the idea of a net stimulus. In Figure 1b, the tax cut appears as an outward rotation of $IS_o$ to $IS'_o$.

Endogenous responses to the policy stimulus work to reduce the amount of output increase noted above. Given a money supply and price level, the spending rate increase pushes interest rates from $r_o$ to $r''_o$. Some private investment is thus crowded out by induced consumption, so autonomous spending falls from $A'_o$ to $A''_o$. In the absence of any price change, the proposed fiscal measures would position the economy at the intersection of $IS_1$ and $LM_o$, at output $Q''_o$ and interest rate $r''_o$. However it is evident from Figure 1c that the aggregate demand shift from $DD_o$ to $DD_1$ creates excess demand at the existing price level $P_o$. The rise to the market clearing price level $P_1$ reduces the real money supply thus shifting $LM_o$ to $LM_1$ in Figure 1b. Observe that the interest rate rises again, this time to $r_1$ and hence private investment falls still further, from $A''_o$ to $A_1$. Accordingly, output falls from $Q''_o$ to $Q_1$. Consideration of the exogenous and endogenous impacts of the tax and budget cuts, finds the economy at higher price and output levels $P_1$ and $Q_1$ with a higher interest rate $r_1$ and lower autonomous spending $A_1$. Quantitatively, the net demand stimulus shown here amounts to a roughly $170 billion increase.[7]

Precluding the inflationary impact described above requires one of three developments: 1) short-circuiting the net stimulus on the demand side through say, adjustments in savings or interest rates; 2) meeting the demand with

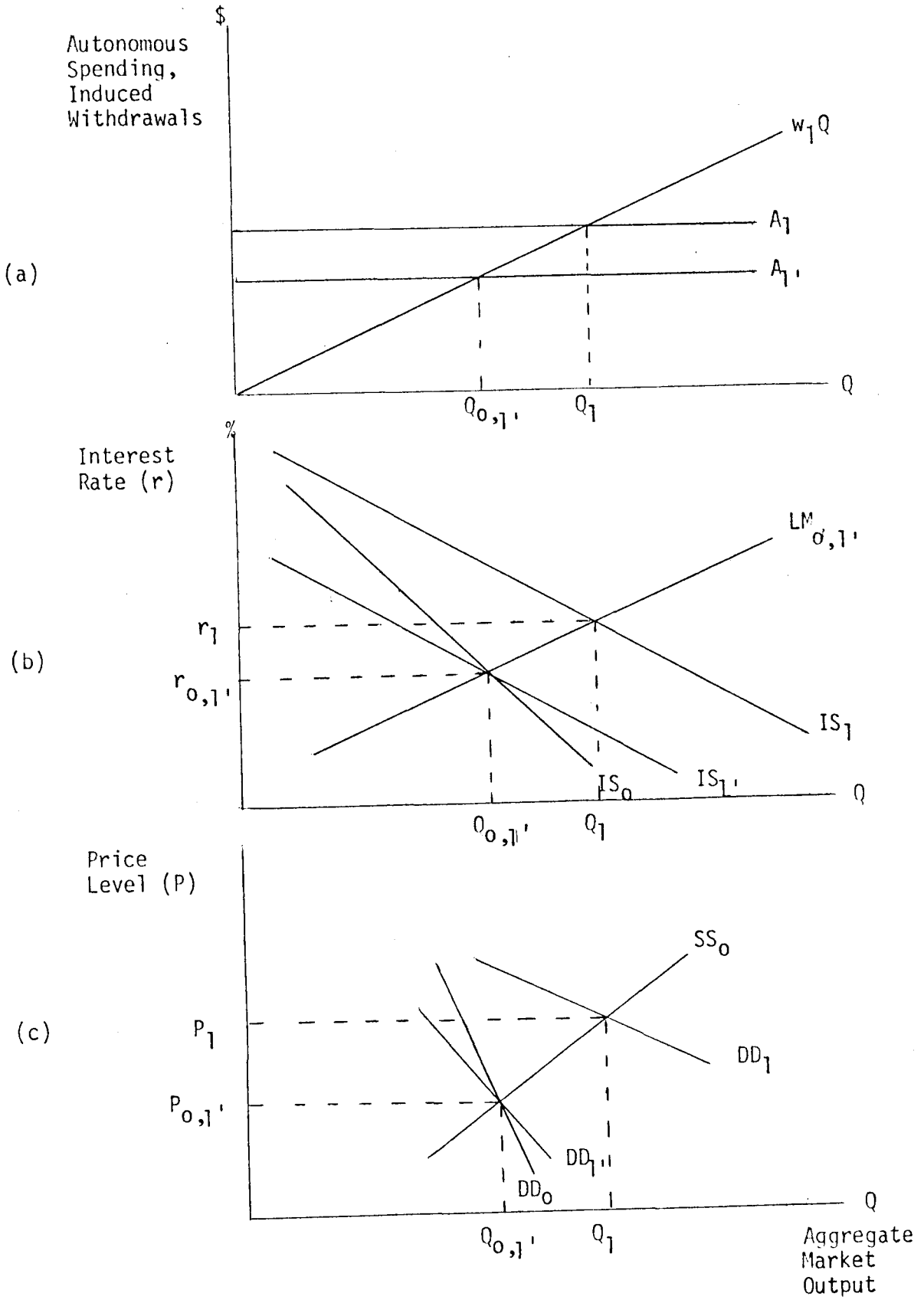
sufficient real output expansion on the supply side; or 3) some appropriate combination of these two factors. However, it is important to recognize that the magnitudes of the necessary adjustments vary significantly depending on whether they are made on the demand or supply side. For example, savings adjustments need only match the size of the initial stimulus in order to offset it. On the other hand, if extra after-tax income is not saved, the compensating supply response will have to be much larger owing to the fact that the net stimulus, when spent, induces a multiple increase in demand. The next section explores arguments holding that savings will rise to squelch the net stimulus on the demand side. Part III then estimates an upper limit to the size of the supply response that can be expected.

Defusing the Demand Stimulus

It will be convenient to ignore initially the possibility of real output increases. This section considers only potential change in aggregate savings behavior which can offset the net stimulus described previously. The three most plausible scenarios under which aggregate savings might rise appreciably are: 1) altered inflationary expectations based entirely upon the whirlwind policy shift of the new administration; 2) altered inflationary expectations based on the actual observance of improving price stability; or 3) a significant decline in durable goods purchases.

In terms of the model, all three of these developments may be depicted as a reduction in autonomous spending. Observe in Figure 2 how the autonomous spending decline from $A_1$ to $A_1'$ leads to a shift of the aggregate demand curve from $DD_1$ to $DD_1'$. Note that price and output return to the original level and thus the policy has been neither inflationary nor expansionary. While the

FIGURE 2


$
Autonomous Spending, Induced Withdrawals
(a)
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$A_1$
$A_{1'}$
Q
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$Q_1$
%
Interest Rate (r)
(b)
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$r_1$
$r_{0,1'}$
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$IS_0$
$IS_{1'}$
Q
$Q_{0,1'}$
$Q_1$
Price Level (P)
(c)
$SS_0$
$P_1$
$DD_1$
$P_{0,1'}$
$DD_{1'}$
$DD_0$
Q
$Q_{0,1'}$
$Q_1$
Aggregate Market Output

disinflationary impact of increased savings is clear graphically, the prospects for this occurrence under each savings scenario warrants examination.

Altering Expectations on Faith. The Reagan policies represent a rather dramatic ideological shift, and possibly, it is the drama of the gesture alone which can be counted on to dampen the public's inflationary expectations. Indeed, the administration has acknowledged that the ability to foster improved expectations is a significant coefficient in its policy equation. However, for the public to accept on faith the disinflationary promise of the new economic package, it seems people must hold two rather prominent notions. First, the public must really believe that government spending is a genuine and major factor in the existing inflation. Second, observers must be convinced that government spending in excess of a noninflationary level truly will be eliminated. While on the former point there may well be public unanimity, on the latter there is surely skepticism. This is certainly not the first Administration ostensibly dedicated to balancing the budget. Moreover, deficit spending is still projected for the early years of the program. Clearly, securing public confidence in the future spending habits of the federal government will require quite a sales effort.

Unfortunately, the sales task facing the Administration is a rather delicate one. Certainly, the permanent tax cuts which are being proposed, if passed, could strengthen the public's perception of a reformed government sector. However, curiously enough, the permanence of the tax policy might also prove counterproductive in the effort to encourage savings. Independently of improved expectations, people may adjust their spending to what is perceived as a permanent increase in their income. The upward revision in expected permanent income could thus result in less private savings than would have occurred had only inflationary expectations changed. Seen in this light,

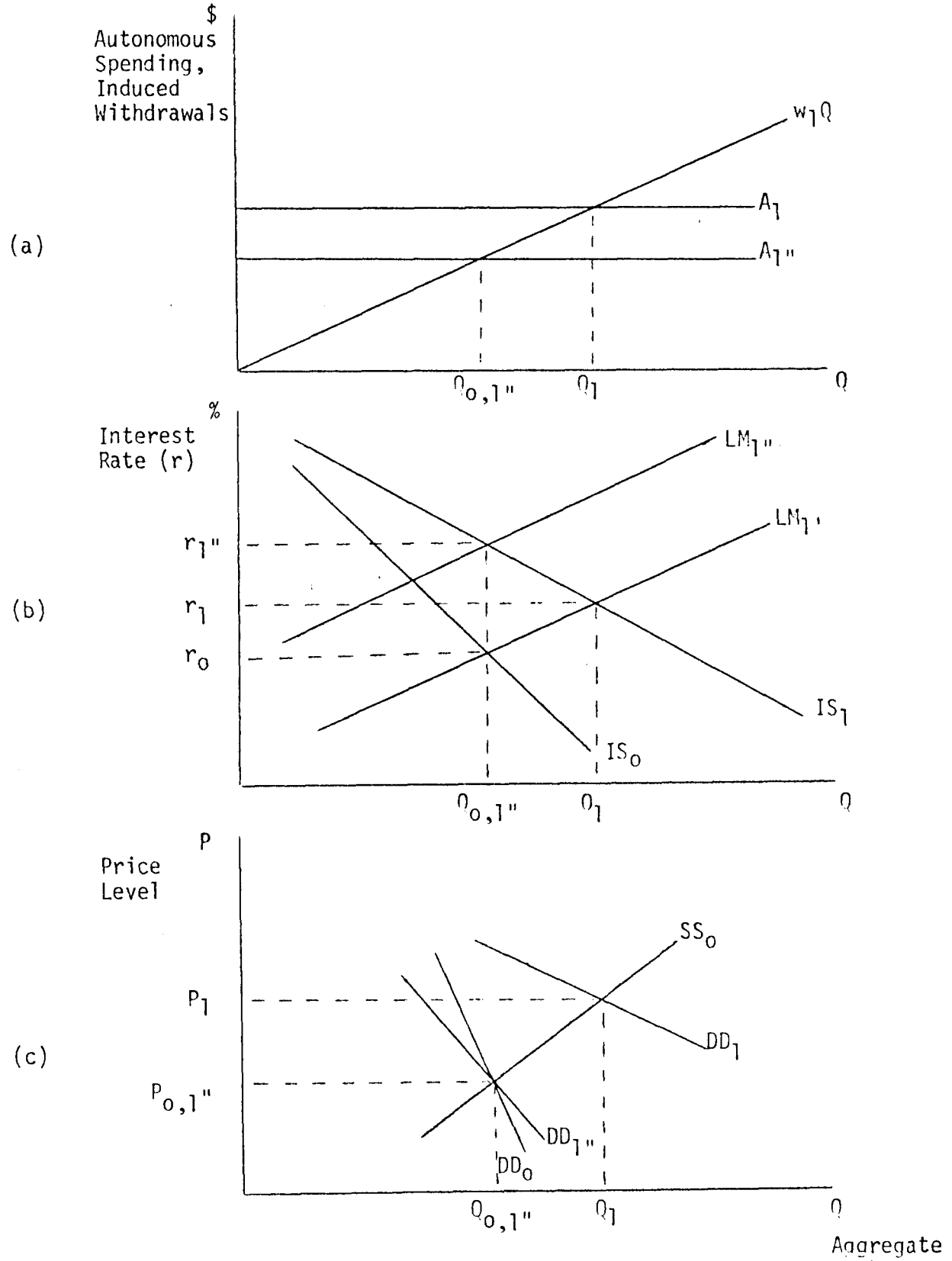
correctly targeting the necessary sales pitch is no simple matter.

Reliance entirely upon persuasion and the public's good faith to reverse inflationary expectations is perhaps quite a long shot. Surely we recall the reception accorded President Ford's WIN buttons, although one might argue that President Reagan is a more charismatic leader operating in the slip stream of a strong electoral mandate. Nonetheless, given the imbued consciousness of inflation, it seems more probable that the public, hopeful as it may be, might well adopt a wait-and-see attitude. In short, savings rates are more likely to change only after people have seen inflation begin to abate.

Altering Expectations Through Tight Money. Should the public require tangible proof of improving price stability, the role of the Federal Reserve System becomes critical. The Fed must act to encourage the expectation of price stability. This can only mean a policy of tight money. Of this point, the Administration is well aware, and in fact, in complete agreement. However, reliance on tight money raises two potential problems. First, the very tight money policy necessary to dampen inflationary expectations will also operate via interest rates to frustrate the longer-term goal of encouraging capital accumulation. The second consideration is simply whether the Fed has sufficiently precise control over the money supply to effect a stable, tight money course.

The problem that tight money creates for longer-term growth is depicted graphically in Figure 3. In Figure 3c, $DD_1$ represents the after-tax demand curve which caused price and output to rise initially from $P_o$ to $P_1$ and

FIGURE 3


$
Autonomous Spending, Induced Withdrawals
$w_1Q$
$A_1$
$A_1"$
(a)
$Q_{o,1"}$
$Q_1$
Q
%
Interest Rate (r)
$LM_1"$
$LM_1'$
$r_1"$
$r_1$
$r_o$
(b)
$IS_1$
$IS_o$
$Q_{o,1"}$
$Q_1$
Q
P
Price Level
$SS_o$
$P_1$
$DD_1$
(c)
$P_{o,1"}$
$DD_1"$
$DD_o$
$Q_{o,1"}$
$Q_1$
Q
Aggregate Market Output

$Q_o$ to $Q_1$, respectively. It is this price increase which the Fed must counter. The Fed's monetary restraint is shown by an inward shift of the LM curve from $LM'_1$ to $LM''_1$ in Figure 3b. Accordingly, the DD curve in Figure 3c shifts back to $DD''_1$ which yields price $P''_1$ consistent with price $P_o$. Note, however, that output has also fallen to $Q''_1$. This decline in output which follows from tight money can have rather significant implications regarding longer term growth and capital accumulation. As indicated in Figures 3a and 3b, the reduction in demand has been accomplished via higher interest rates, $r''_1$ versus $r'_1$, and thus lower levels of autonomous spending, $A''_1$ rather than $A_1$. It is thus important to consider precisely what type of borrowing is likely to be crowded out, consumers or producers. To the extent that it is the latter, tight money achieves the necessary price stability at the expense of longer term capital formation. Of course, some of the crowding out can be offset by accelerated depreciation allowances and corporate income tax reductions.

Recently, Mr. Weidenbaum has suggested the possibility of an offsetting increase in velocity, the number of times each dollar is spent annually.[8] In this event, the shift of $LM'_1$ to $LM''_1$ in Figure 3 would be eliminated as would the rise in interest rates. However, for nominal GNP to grow at the proposed 11.5 percent annual rate, while MIB grows at only a 4.5 percent target rate, velocity must increase by 31 percent over the 1980-1984 period. So dramatic an increase in velocity seems hard to imagine given that during the previous four year period velocity rose only 17 percent.[9] Moreover, even if the requisite change in velocity does occur, the revised prospects for growth come at the expense of continued inflation.

The implications of tight money described above presupposes that the Fed is, in fact, able to institute such a policy. However, recent data on the

money supply suggests that this may not be such a reasonable assumption. Recall that in October of 1979, Chairman Volcker adopted a new policy tack. Rather than attempting to peg money market rates, the Fed shifted its focus to controlling monetary aggregates. Figure 4 tracks the behavior of M1B at monthly intervals for the period 1/79 to 12/80[10] Given the new policy directive initiated on October 6, 1979, one might anticipate smaller fluctuations in the monetary aggregates thereafter. Figure 4 indicates just the opposite in fact occurred. It seems ironic, to say the least, that the Fed's new policy of targeting monetary aggregates has resulted in even more erratic movements in M1B. Arguably, this observation may be nothing more than evidence of early pangs of adjustment. Perhaps the Fed's new policy will take many months before its full impact shows up in terms of smoother movement in the monetary aggregates. Nevertheless, the data indicate quite clearly that the Fed is not completely in control, and thus should not be counted upon too heavily to fulfill its counter-inflationary role of tight money with great precision.

Shift in Durable Goods Consumption. Neither of the two scenarios under which perceptions of price stability might be fostered - a super sales job by the Administration or an effective tight money policy - seem to hold a promise that would comfort a policy maker. Now consider a quite different scenario under which tax cuts might be saved. So called "bracket creep", in conjunction with the scheduled increases in social security taxes, could effectively wash out the additional disposable real income currently in prospect. If this is the case, it may be more appropriate to interpret the tax cut as temporary. Under a permanent income hypothesis, temporary tax

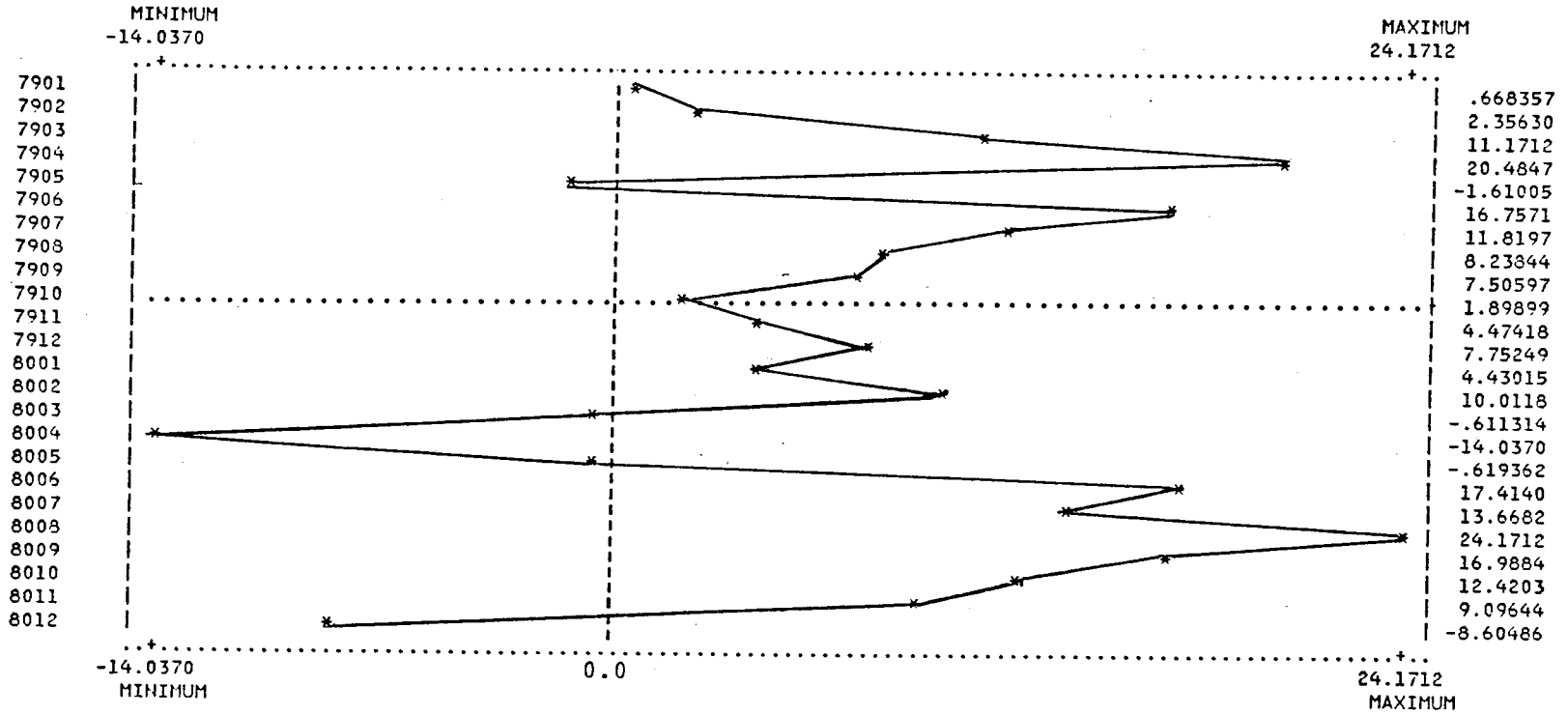



FIGURE 4: Monthly Percentage Changes in M1B, 1/79-12/80

reductions are viewed as transitory income and thus wind up entirely in savings. This interpretation would appear to lend considerable support to the Reagan assumption that a large part of the tax cut will be saved. Bear in mind, however, that in the specification of the permanent income hypothesis, savings is defined to include durable goods purchases. It seems, then, that an argument must be made supporting the likelihood that a tax cut will not go toward increased durable goods purchases. Clearly, disinflation requires that it be saved in the more traditional sense of the term.

In recent Congressional testimony, Professor Rutledge has argued precisely this point.[11] He maintains that the current economic conditions are such that we can expect a general decline in durable goods purchases. The logic of Professor Rutledge's argument appears to be as follows. During the inflationary experience of the past four years, households may have been inclined to invest heavily in durable goods as a hedge against inflation. Why should this hedge take the specific form of durable goods purchases rather than other consumer goods or financial assets? First, durable goods are storable where consumer services and non-durables are not. Second, unlike many financial assets, durable goods are purchasable out of future rather than current income and wealth. In short, durable goods may be the common man's hedge against inflation. Given the recent history of inflation, households may be currently in a situation where they discover themselves holding an abnormally high level of durable goods inventories. One might then expect households to live off these inventories in the near future and thus not spend the tax cut on durable goods.[12]

Rutledge's scenario has some appeal. Its credibility, however, relies on two empirical issues. First, is consumer durable expenditure characterized by cycles which may interpreted as inventory accumulation and depletion?

Second, if so does the economy at the present time appear to be in a phase of the cycle amenable to inventory depletion? That is, are we moving out of a period of accumulation as Professor Rutledge suggests?

In order to address these questions, we must first construct a variable capable of detecting this possible phenomenon of durable goods inventorying. For this purpose we chose the ratio of durable to non-durable consumer expenditure. This is an obvious measure of durable inventorying due to the simple fact that non-durable goods are not storable, as a rule. Furthermore, the major non-durable purchases such as food and clothing are for the most part necessity goods and therefore are nondiscretionary purchases. This suggests that non-durable purchases are the most stable component of the consumption function. The stability of this component justifies its use as a reference point around which to measure fluctuation in the purchases of durable goods. The likelihood that durable purchases will vary follows from the idea that durable goods tend more to be luxury items and therefore are purchased out of discretionary income. The interpretation of this variable is straightforward. A rise in the ratio indicates that durable inventories are being accumulated, a decline indicates depletion.

The question of whether there exists a durable purchases inventory cycle was addressed simply by plotting quarterly movements in the actual durable-non-durable ratio for the period 1960-1980 relative to its base trend. The residual plot appears in Figure 5. Casual inspection of the graph confirms the general idea of a durable inventory cycle, although there are a number of implications to this plot which should also be noted. First, the durable inventory cycle is highly correlated with the business cycle. Second, the amplitude of the inventory cycle appears to be greater in the 70's than in

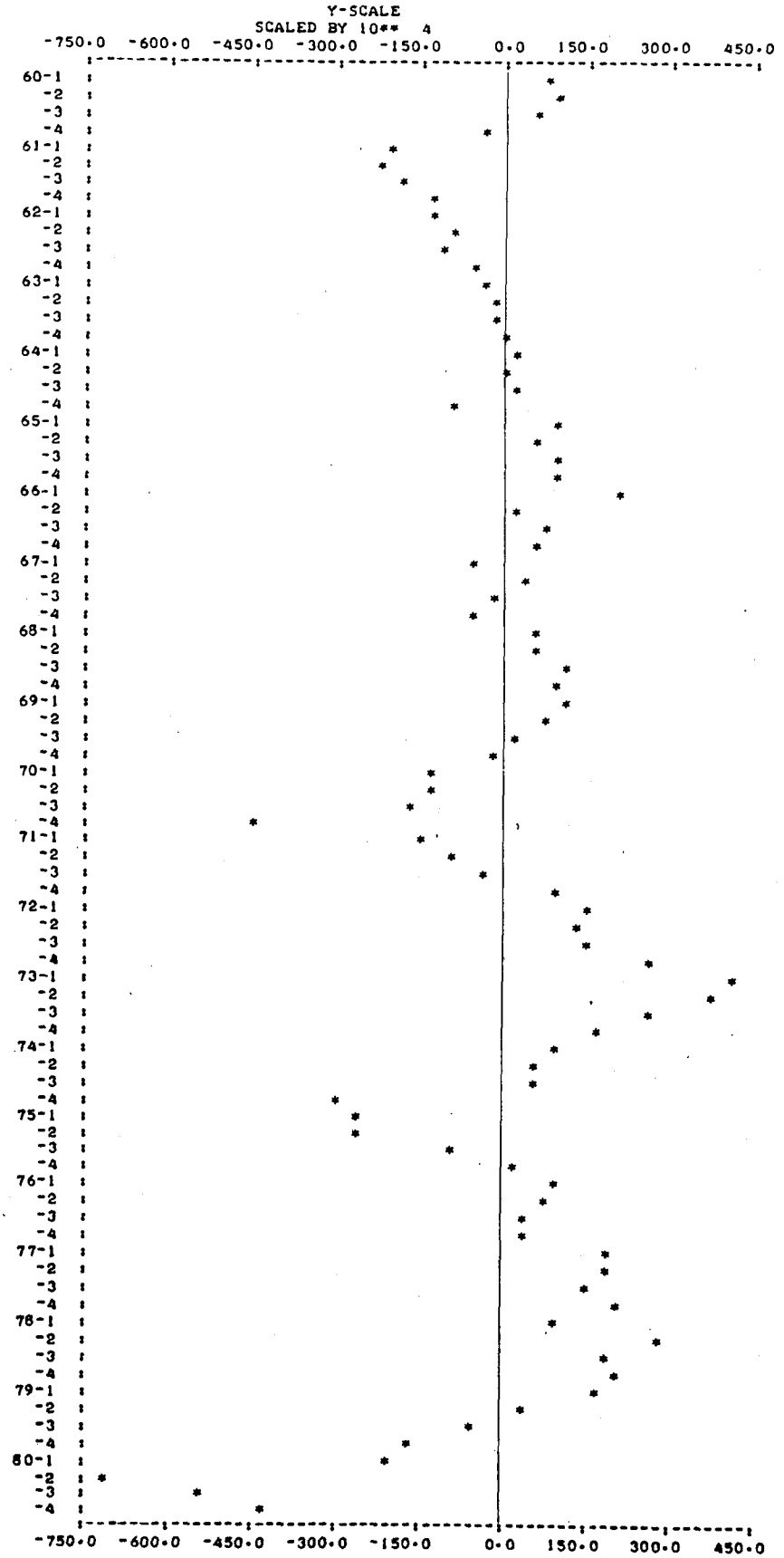



Figure 5: Quarterly Trend Residuals in Durable/Non-Durable Consumption Goods 1960-1980

the 60's. In a modest sense, the increased amplitude of the inventory cycle lends tentative support to Rutledge's scenario. Since the 70's were generally a more inflationary period, perhaps the greater amplitude is reflecting the use of durables as an inflationary hedge. But, perhaps not. Clearly, there are other plausible explanations.[13] However, what is of empirical interest is not the explanation of the durable inventory cycle. Rather, it is the question whether such a cycle exists. The data indicate quite clearly that it does.

The second critical empirical issue in Rutledge's scenario is whether we appear to be in a phase of the inventory cycle amenable to inventory depletion. Judging from the graphs, the answer here is a resounding "perhaps yes, but probably not." From the fourth quarter of 1975 until the fourth quarter of 1978 there was a sustained increase in the durable/non-durable ratio. However, with the first quarter of 1979, the ratio falls again, thus suggesting durable inventory depletion. This depletion appears to end during the second quarter of 1980 with the rest of that year suggesting a renewed upward trend in relative durable goods expenditure. Though one can hardly project a continuing trend from two quarters observations, it is possible to say with some certainty that durable stocks are not at the peak of an inventory cycle. It is, of course, a peak which would have to be evident presently for Rutledge's scenario to seem most persuasive. Only if most of the excess inventory acquired prior to 1979 remains serviceable and will be depleted over the 1982-1984 period does this scenario for reduced spending seem plausible.

The thrust of Part II can now be summarized. First, if a net tax stimulus is not to be inflationary, it must be saved. To an unknown and perhaps minor extent, such savings may be forthcoming simply if people are

convinced that the new Reagan program will be effective. Here, clearly, salesmanship is important. It is unrealistic, however, to ignore the possibility that the public must be given more concrete evidence that inflation will slow. This places considerable responsibility with the Fed. There must be tight money. At this point the logic lapses in two respects. If monetary policy is effective, the resulting price stability may be achieved only at the expense of higher interest rates and thus less capital accumulation. Alternatively, reflection on the recent history of monetary policy indicates that the Fed cannot necessarily be counted on to control the money supply. This implies that, as people spend the tax cut, inflation continues and thus reduces any incentive to save the cut in the first place. Finally, we considered that households might save most of the tax cut if currently they are overstocked with durable goods. However, recent evidence on the relative level of existing stocks does not lend plausibility to this hypothesis. It would seem then, despite fervent hope to the contrary by most everyone, disinflationary demand side developments are less than certain prospects.

The Supply Response

To this point, the near term avoidance of inflation in the face of a net stimulus has been treated as requiring an increase in personal savings. Certainly, the anti-inflation claim for the new policy is based on more than this. Extra income that is spent rather than saved need not be inflationary if matched by output increases. This increase must occur quickly, however, if the net stimulus does induce a spending surge. Furthermore, once the income injection has escaped into spending the multiplier effect implies that the output expnasion must be larger than the injection in order to prevent upward

price pressure.

The immediacy of the necessary supply response precludes reliance on capital accumulation to provide the productivity increase. In the nearer term, output expansion would most likely come from two sources: 1) more people choosing to work more hours in the market economy; and 2) elimination of unproductive regulation. This section explores the probable magnitudes of these short run supply responses.

Increased Labor Force Participation. While tax cuts retain their demand side implications, economists have been correct as of late to emphasize the impacts that tax cuts can also have on labor force participation. Progressive marginal tax rates mean progressively lower after-tax wages on additional hours worked. As a result, the real price of leisure relative to labor declines, and individuals tend to substitute leisure for labor. It follows, then, that marginal tax cuts could reverse the trend in the price of labor relative to leisure and thus encourage labor force participation. This theoretical proposition has, in fact, been confirmed in numerous empirical studies. The consensus of this literature appears to be that a one percent change in marginal tax rates will cause a 0.2 percent change in hours worked.[14] If we consider the 10 percent tax reduction currently being proposed for 1982, we might anticipate a two percent increase in hours worked, or roughly one additional week annually per employed worker.[15]

It seems reasonably clear then - - tax cuts can increase real output simply because they provide people with the incentive to work more. However, it is inaccurate to envision this entire real output increase as a net gain capable of offsetting the demand increase discussed previously. In fact, a substantial portion of the increased output which ensues from increased

labor force participation goes to meet demand which is induced independently of the initial demand stimulus associated with the tax cut.

To see this point, consider the meaning of the term leisure as it is used in national income accounting. Leisure is that amount of time for which the individual is not engaged in market production, that is, output that will be measured in the national income accounts. Within this broad notion of leisure, it is then useful to view the individual as leisuring either in the pure recreational sense or engaged in "household production." This latter component of leisure is believed to be particularly sensitive to the marginal tax considerations.[16]

The argument is an intuitively appealing one. Consider an accountant for whom a well-maintained yard figures prominently in the utility function. Assuming the accountant does not loath yard work, he faces a pure economic choice. He either does his own yard work and thus engages in household production, or he uses a lawn service and thus allocates earned income to purchase market production. The relative prices that figure in his decision are significantly affected by the marginal tax rates. The accountant surely recognizes that if he hires the lawn service, he must pay a pre-tax wage with his own post-tax income. Moreover, since the decision is between spending five more hours a week accounting versus five more hours of household production, the extra hours of market production and, equivalently, earned income, are taxed at the highest marginal rate. If instead the accountant does his own yard work, he in effect provides, as well as receives, yard services tax free. It is in this sense that excessively high marginal tax rates are understood to drive a "wedge" between the demanders and suppliers of market goods and services. It is thus argued that lowered marginal tax rates will induce individuals to substitute market for household production. In this way, real output as measured in the national income accounts will rise. However,

the crucial conclusion that may be wrought from this anecdote is that, while measured output has risen as a result of tax cuts, so too has the demand for that output. Indeed, the decision to work in the market economy is simultaneously a decision to replace previous household production with market expenditure. This logic suggests that the supply response to marginal tax cuts might be washed out completely by the concomitant demand response. This is probably not the case. Clearly, to the extent that tax cuts move labor from household to market production, there are gains in productivity owing purely to increased specialization.

In addition to the substitution of market for household production, it is also likely that an accountant will opt for work over recreation. This shift is a second substitution effect through which real measured output may rise. However, once again it is incorrect to view the output increase entirely as a net gain capable of stemming inflation. The decision to consume recreation rather than earn income implies a preference for recreation at least equal to the value of market goods that could have been purchased with after-tax income. If an individual moves from recreation to labor as a result of marginal tax cuts, he must replace the foregone satisfaction previously obtained through recreation with additional consumption.

Casting this anecdote in more quantitative terms, permits at least an intuitive estimate of the magnitude of real net output increases which are likely to follow from marginal tax reductions. Suppose our accountant grosses $25.00/hr. or, assuming a 2000 hour work year, $500,000/yr. Currently, earned income of this amount is taxed at a 50 percent marginal rate. A 10 percent rate cut induces an additional forty hours labor over the year. Obviously, these additional forty hours are drawn from leisure. For illustrative ease,

assume that the accountant substitutes equally from household production and recreation in favor of labor.

Table 1 presents the output and expenditure accounting for the labor-leisure substitution which follows from tax cuts in the highest tax bracket. Twenty fewer hours of both household production and recreation each transfer into $500 more earned income. These two $500 income increments are then taxed at the new 45 percent marginal rate leaving $275 of additional after-tax income. A portion of this income must go to purchase market output to compensate for either foregone recreation or foregone household production. The amount of this expenditure or market output must be at least $251 in each case. If this were not the implicit value, the accountant would have been working more and leisuring less at the original 50 percent marginal tax rate. The net income gain is thus $24. In the case of substituting household production for market production, this net gain may be attributed to the specialization which the market affords. In the recreation substitution, the net $24 simply reflects that additional hours worked in the market are taxed less and thus more after-tax income is received. It seems reasonable that part of this net gain would be spent. However, to set a maximum on the output expansion available to offset the demand stimulus of Part I, we assume it is all saved.

The other parts of the withdrawal from the extra income are the two $225 increments to government tax revenue. Recent experience would indicate that all of this would be reinjected into the spending stream, thus not permitting an anti-inflationary or net addition to purchasable output. The recovery program, however, calls for federal spending to grow at a slower rate through 1984 than federal tax receipts (5.42 percent annual rate versus 8.68 percent annual rate).[17] Hence, the governmental marginal propensity

TABLE 1: Output-Expenditure Accounting, 50% Tax Bracket

| HOUSEHOLD PRODUCTION | | | ACCOUNTING EXPLANATION | RECREATION | | |
|---|---|---|---|---|---|---|
| Q | W | E | | Q | W | E |
| $500 | | | ... Gross income ... | $500 | | |
| | $-225 | | ...Tax @ 45% marginal rate ... | | $-225 | |
| $275 | | | ... After tax income ... | $275 | | |
| | | $-251 | ...Expenditure compensation... on foregone leisure utility | | | $-251 |
| | $ 24 | | ... Income gain due to market specialization | | | |
| | | | Income gain due to recreation substitute ... | | $ 24 | |
| | | $ 251 | ... Induced private expenditure ... | | | $ 251 |
| | $ 249 | | ... Induced withdrawals ... | | $ 249 | |
| | | $ 140 | ... Planned public expenditure ... | | | $ 140 |
| | | $ 391 | ... Total expenditure ... | | | $ 391 |
| $500 | | | ... Induced output ... | $500 | | |
| 21.8% | | | ... Net addition to output as percentage of increased hours worked ... | 21.8% | | |

to spend of 1.00 might be reduced to 0.6. Applying this factor, government spends $140 out of the expected extra $225 in taxes.

Combining the induced private and planned public spending increases, it should be clear that, for every $500 worth of increased output provided by those in the top tax bracket, there ensues at least $391 worth of additional spending. In other words, for every additional hour worked by the relatively rich, only 22 percent of the additional output can be viewed as a net "supply-side" response. Table 2 repeats the computations of Table 1 for an individual assumed to be in the $25,000/year, 32 percent marginal tax bracket. Only 13.5 percent of the additional output by an individual in this situation is a net gain.

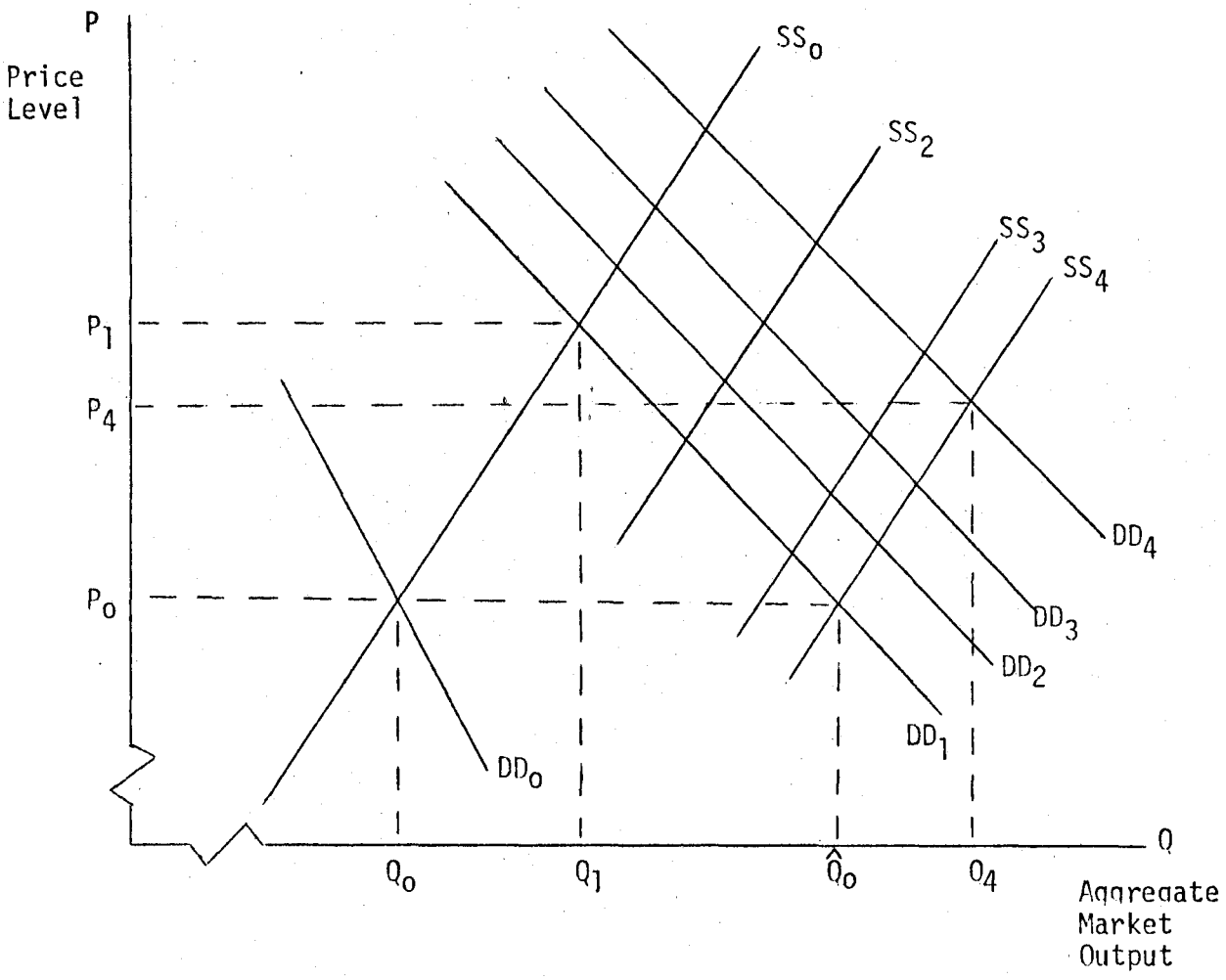
Comparison of Tables 1 and 2 indicate that the net supply-side response falls with base income. Because the marginal personal tax rate for the economy as a whole has been computed at just under 32 percent, the hypothetical taxpayer depicted in Table 2 may be viewed as representative of the entire distribution of taxpayers.[18] Hence, only about 13.5 percent of the output from extra market activity will be available to offset the added spending arising from the personal tax cuts.

The analysis thus far is summarized in Figure 6. A tax rate change rotates the economy's aggregate demand curve out from $DD_o$ to $DD_1$ along the original aggregate supply curve $SS_o$. This produces price level $P_1$ and output $Q_1$. However, recognizing that tax cuts also induce the substitution of labor for leisure, we must incorporate these labor supply effects into the analysis. The shift from $SS_o$ to $SS_4$ represents the entire supply response. As indicated in Tables 1 and 2, this supply response is composed of three parts: 1) the pure substitution for household production, ($SS_o$ to $SS_2$); 2) the pure substitution for recreation, ($SS_2$ to $SS_3$); and 3) the net income gains associated

TABLE 2: Output-Expenditure Accounting, 32% Tax Bracket

| HOUSEHOLD PRODUCTION | | | ACCOUNTING EXPLANATION | RECREATION | | |
|---|---|---|---|---|---|---|
| Q | W | E | | Q | W | E |
| $250 | | | ... Gross income ... | $250 | | |
| | $ 72+ | | ... Tax @ 29% ... | | $ 72+ | |
| $177+ | | | ... After tax income ... | $177+ | | |
| | | $171 | ...Expenditure compensation... @ 68% | | | $171 |
| | $ 6+ | | ... Income gain due to market specialization | | | |
| | | | Income gain due to recreation substitute ... | | $ 6+ | |
| | | $171 | ...Induced private spending... | | | $171 |
| | $ 79 | | ... Induced withdrawals ... | | $ 79 | |
| | | $ 45+ | ... Planned public spending... | | | $ 45+ |
| | | $216+ | ... Total expenditure ... | | | $216+ |
| $250 | | | ... Induced output ... | $250 | | |
| 13.5% | | | ... Net addition to output as percentage of increased hours worked ... | 13.5% | | |

FIGURE: 6


P
Price
Level
SS0
SS2
SS3
SS4
P1
P4
P0
DD4
DD3
DD2
DD1
DD0
Q
Q0
Q1
Q̂0
Q4
Aggregate
Market
Output

with market specialization and recreation substitution, ($SS_3$ to $SS_4$). If there is no induced expenditure accompanying increased labor force participation, then the economy could move to output $\hat{Q}_o$ at the original price level $P_o$. This may be what the Administration envisions. However, as the discussion in this paper has indicated, this is an incomplete depiction of the adjustment process. Foregone household production and recreation invite replacement demand for market output. This induced demand is reflected in the shifts from $DD_1$ and $DD_3$, respectively. Clearly, while increased labor force participation contributes to market output, it simultaneously spurs demand. A final shift to $DD_4$ incorporates the additional spending associated with federal spending.

The point of the foregoing analysis is that at best only 13.5 percent of the increased hours of labor force participation make a net contribution to market output. Hence, the previously cited labor supply elasticity should be adjusted downward to .027 to capture only the anti-inflationary element of the tax cut. This information now permits an estimate of the aggregate net output response. In 1981, just under 170 billion man-hours are expected to produce a GNP of $2,920 billion.[19] A 0.27 percent annual increase in hours worked would suggest a nominal output increase of $8.72 billion the first year.[20] Over three years the total is $58.75 billion.[21] This represents only about one-third of the policy's net spending increase of $170 billion. However, a further disinflationary impact is promised from government deregulation. This aspect of the policy is explored below.

Response to Deregulation. Government regulation has long been recognized as an important contributor to inflationary pressures. Regulation adversely

affects economic growth and productivity by discouraging innovative research and development, reducing investment in new plants and equipment, raising unemployment by increasing labor costs, and decreasing competition. In the short run, costs of regulation arise in several other ways. Outlays for a bureaucracy to administer and enforce rules lead to higher Federal taxes. Compliance costs are incurred by business in the process of meeting legal mandates and require that a firm divert resources from activities that contribute to output. Consumers, because of regulation, thus pay higher prices to purchase fewer goods and services.

The major benefits attributed to regulatory activities include protecting the environment, promoting health and safety, safeguarding workers and consumers, and guaranteeing equal opportunity. Because such benefits are often so difficult to accurately quantify, arguments can be made that government intervention is excessive, that the costs exceed the benefits in many cases. When inflation is a serious problem, the attractiveness of these less tangible benefits relative to the price increases they entail may fall. Nonetheless, just as regulation can be excessive, its reduction can be overdone. Many regulations may be unnecessary or may have cheaper, equally effective alternatives. All certainly do not. To the extent that deregulation activity recognizes this limitation, the scope for permitting output increases or price reductions is confined to the subset of mandates that are unjustifiable. Assuming reasonable measurement accuracy is possible, extensive cost benefit analysis is necessary to identify that subset.

Figures included in the President's "Program for Economic Recovery" provide a reasonably good approximation of the compliance costs the Administration believes are unjustifiable. The budgets of the various bureaucracies that issue, administer, and enforce regulations are to be reduced by about

$100 million in 1981 and by about $500 million in 1982.[22] Weidenbaum estimates that on average, each dollar Congress appropriates for regulation tends to result in an additional $20 of compliance costs imposed on the private sector.[23] Combining those figures suggests that compliance costs of about $2 billion in 1981 and $10 billion in 1982 and beyond can be eliminated. Aggregating those figures indicate that the Administration believes a total of about $32 billion in compliance costs can be saved over the next four years.

The ability of deregulation to lower prices and increase output in the short run is further limited by a technical factor. Some of the costs that businesses incur to comply with government mandates vary with output and some do not. Compliance measures like the acquisition and installation of capital equipment, say to reduce pollution emissions or to enhance worker safety, have added a fixed cost to production. The investment of resources in attempts to favorably influence the evolution of government controls on business might also be viewed as a fixed cost of regulation. In essence, much of the compliance costs imposed by regulation have the attributes of a lump-sum tax. Therefore, removal of regulations responsible for such lump-sum taxes does not change the marginal costs of production. Hence, the most profitable short run output of impacted firms remains unchanged.[24] Initially, regulatory cost savings only enhance the profits of existing firms due to reduced average costs. Price reductions and output increases follow only under the pressure of competitive entry. The period required for entry can range from a few months for small service industries to several years for large manufacturing or energy industries. Further, the presence of economies of scale in impacted operations can prolong or preclude entry. The point of the argument is simply

that supply response in the near-term is confined to the subset of regulations that impose variable compliance costs.

Reinforcing this conclusion is the apparent legislative preference for quantitative standards rather than unit taxes in the management of the environment. The usual justification for standards is that administrative problems are greater with effluent taxes. Similar considerations may produce the same tendency in other areas of regulation. As already noted, administrative costs make up only about one twentieth of measurable regulatory costs. By minimizing administrative costs, government probably has not only increased the share and size of the burden of regulation on the private sector but also has reduced the portion of that burden that can be quickly eliminated by a policy change. Like capital stock expansion induced by business tax breaks, much of deregulation produces output expansion only in the long run.

The foregoing analysis suggests that the magnitude of the early increase in supply due to deregulation must be adjusted to account for the fixed component of compliance costs. Weidenbaum reports figures which show that over 30 percent of the estimated $82 billion spent by business in 1977 to comply with government mandates was for new plant and equipment just to meet OSHA rules and environmental requirements.[25] Costs of an equally fixed nature certainly form a part of complying with regulations in the areas of consumer safety, health, financial disclosure, and personnel practices. Unfortunately, fixed share estimates for these costs are unavailable. Nevertheless, the information at hand suggests that roughly 70 percent of compliance costs are variable and thus would soon be passed on to consumers as price reductions or output expansions following reduced regulation. Adjusting the business savings figure of $32 billion by the 70 percent factor

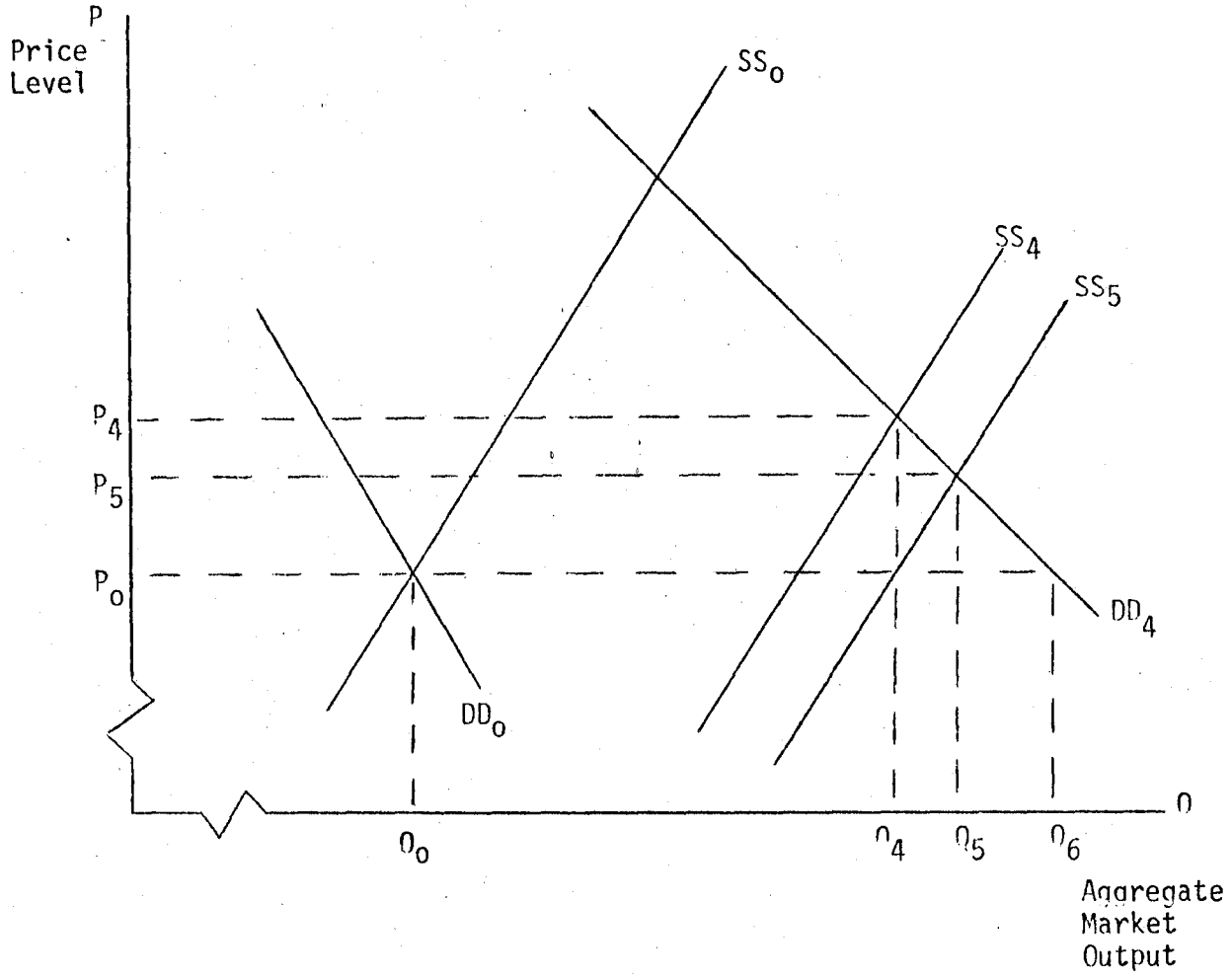
indicates that it is more reasonable to expect firms to pass on no more than $22.4 billion in regulatory cost savings.

Recall from Figure 6 that labor force participation positioned the economy at the intersection of $SS_4$ and $DD_4$. In Figure 7, we now add the output response to deregulation depicted as a shift from $SS_4$ to $SS_5$. The remaining gap between $Q_5$ and $Q_6$ reflects the conclusion that together, the near term supply responses will not offset all of the net spending increases. If traditional savings rates hold, the economic recovery program would appear to add to inflation.

Our estimates find that increased savings must offset over one-half of the early stimulus of the program. It should be emphasized that this is probably a minimum portion since the supply side response presented here has been generously estimated. At several steps empirical assumptions most favorable to the Administration's case have been made. For example, fixed compliance costs incurred by programs other than OSHA and EPA regulations are ignored. Of perhaps greater significance are the optimistic assumptions associated with labor force participation.

First, savings claim all of the net income increase from market specialization and recreation substitutions. Second, structural constraints which may prevent labor from working extra hours at market jobs are ignored. Finally, government is assumed to spend only 60 percent of the additional tax receipts generated. While this reflects the rate of budget growth projected by the Administration, there are numerous exogenous factors which would cause outlays to rise endogenously. For example, an adverse supply shock such as in poor harvest will affect the CPI causing outlays for indexed programs to rise automatically. Obviously, the Administration counts on having considerable good luck. In view of these caveats it is probably most

FIGURE: 7


P
Price
Level
SS0
SS4
SS5
P4
P5
P0
DD4
DD0
0
0o
04
05
06
Aggregate
Market
Output

realistic to rely on the supply responses carrying significantly less than one-half of the anti-inflation burden in the 1982-1984 period.

## Summary and Conclusion

Over the 1982-1984 period, the "Program for Economic Recovery" proposes to inject some $293.2 billion extra spending power into the private sector of the economy while reducing Federal spending only by $197 billion. Analysis in this paper indicates that increased labor force participation and recommended deregulation, at best, can offset roughly $81 billion of additional spending. Due to the multiplier effect, this represents less than one-half of the net stimulus. Recent data suggest that neither durable good inventorying nor stable tight money policy can be counted upon with complete confidence to encourage the necessary adjustment in savings. The evidence indicates that the disinflationary promise in the recovery program relies on a savings rate two to three times historical rates. Furthermore, even 15 to 20 percent savings would only prevent an increase in inflation, not reduce it.

Perhaps the watershed character of the recovery package is enough to engender such a savings response. But this response must occur in the face of an intriguing paradox. On the one hand, if the tax cut is treated as an increase in permanent income, then households may quickly increase their level of spending. Alternatively, if inflation continues, and the phenomenon of bracket creep coupled with scheduled increases in payroll taxes are widely recognized, the tax cuts represent only a temporary increase in income and thus might largely be saved. That reaction, however, depends on inflation pushing wage earners into higher tax brackets. Paradoxically, inflation must continue, or an added incentive to spend is created!

Can pure faith in the long term merits of encouraging capital formation sustain support for a program that fails to fulfill its short term promise

of disinflation? Given the arguments assembled here, the answer to this question appears crucial to the ultimate success of the "Program for Economic Recovery."

FOOTNOTES

1 Fiscal Year 1982: Budget Revisions, March 1981, Office of Management and Budget. The estimated tax savings aggregated over those three years is $293.2 billion (p. 123) while the aggregate budget savings over the same three year period is $197 billion. Savings in both cases are defined as reductions relative to the projections of the previous administration.

2 See for example Donald Regan, Treasury Secretary, as quoted in New York Times, January 26, 1981, p. D1.

3 The Wall Street Journal, March 24, 1981 cites estimates by Townsend-Greenspan of a savings rate for the late 1970's of between 9 and 10 percent of disposable income, or not quite twice the rate reported by the Commerce Department. Receipts from the sale or refinancing of homes have risen sharply in inflation. It is argued that resulting appreciation represents an addition to both income and savings, providing a large hidden component of savings.

4 See for example Robert Hall, Chapter 3 in Income Maintenance and Labor Supply: Econometric Studies. Edited by Glen G. Cain and Harold W. Watts, Chicago, Rand McNally College Pub. Co., 1973. T.J. Wales, "Estimation of a Labor Supply Curve for Self-Employed Business Proprietors," International Economic Review, Feb. 1973, Vol. 14, #1, pp. 69-80.

5 In the context of the comparative static model used, this stimulus is to be interpreted as an increase relative to the basic trend in nominal aggregate demand. Thus, the price level increase depicted is in addition to the upward price trend or inflation rate existing independent of the policy being discussed.

6 See for example W.H. Branson, Macroeconomic Theory and Policy, 2nd Ed., Harper & Row, 1979, Chapter 6 or Robert J. Gordon, Macroeconomics, 2nd Ed. Chapter 7 for two different derivations of the direct relation between the aggregate output supplied and the price level in the economy.

7 G. Fromm and L.R. Klein, "A Comparison of Eleven Econometric Models of the U.S.," American Economic Review, Vol. LXIII, #2, May 1973, Table 6, page 392. The GNP-tax multipliers they cite average from .3 to .9 below the GNP-expenditure multipliers, and fall in the range of 1.2 to 2.2 at peak. An average of 1.75 is adopted for our presentation.

8 See Steven Rattner's article in The New York Times, March 6, 1981.

9 GNP is projected to grow from $2,629 billion to $4,098 billion by 1984. At a target growth rate of 4.5 percent, MIB would increase from $397.8 billion to $474.4 billion. The required increase in velocity would have to be from 6.6 to 8.6. Between 1975 and 1979 VIB (GNP/MIB) increased from 5.5 to 6.4 or only by 17 percent. This adjustment occurred during a period of rather dramatic revision in the public's banking practices, e.g. NOW accounts, Treasury bills, small denomination savings certificates, and money market mutuals.

10 Thanks to Ray Stone of Fidelity Bank of Philadelphia for pointing out this disconcerting evidence and for providing the depiction of it.

11 Appearance before the House Ways and Means Committee as reported in The New York Times, March 5, 1981.

12 Generally, Rutledge's notion of a durable goods inventory cycle appears to draw upon L.A. Metzler's classic investment article "The Nature and Stability of Inventory Cycles," Review of Economic Statistics, Vol. 23, #3, August 1941, pp. 113-129.

13 The two decade residual plot obscures the fact that the trend line is upward over the whole period, moving from about .25 in 1960 to about .43 in 1980. This increase is probably largely explained by the rising per capita income as well as demographic changes which occurred over the period. Also hidden is the fact that the trend flattened out in the 70's relative to the 60's.

14 This is the response magnitude distilled by Steve Collar, University of Illinois in his forthcoming dissertation from the sources cited in footnote 4 and other more complex studies of labor supply elasticity.

15 This probably should be viewed as a maximum response coefficient for two reasons. First, the 0.2 percent change is a point elasticity estimate for a small 1 percent tax rate change. The tax cut proposals, on the other hand, cover a range of 10 percent per year and 30 percent in aggregate. As tax cuts raise the price of leisure by large increments, the responsiveness of leisure demand may fall significantly. Hence, the rate at which the last parts of the tax rate reduction stimulate work may fall. Two, a concentration of rate cuts in upper income brackets should have less impact on work. The incentive to substitute market activity for leisure at high income levels can't be as acute as at lower income levels. Technically, the income effect is more likely to dominate the sbustitution effect at higher incomes. Hence, leisure's attractiveness relative to extra income rises as more of the tax cut accrues to high income folk.

16 See for example V.A. Canto, D.H. Joines, and A.B. Laffer, "An Income Expenditure Version of the Wedge Model," in the proceedings of 1978 West Coast Academic/Federal Reserve Economic Research Seminar, pp. 27-59.

17 These percentages are each a geometric average of the rate of outlay and receipt growth, respectively, reported in Budget Revisions . . . , p. 11.

18 Robert Gordon, Op. Cit., pp. 509-10, computes an overall marginal tax rate as "the percentage of any change in GNP that automatically leaks out of the spending stream into government tax revenue plus the percentage that is automatically injected back into the spending stream in the form of income-contingent transfers, . . ." He reports a marginal tax rate of 31.3 percent for 1975. Applying his computation formula for the years 1976-1980 yields percentages that average just under 30 percent.

19 Regressing manhours (MH) worked on real GNP (RGNP) for the 1960-1980 period provides the following equation: MH = 48.717 + 0.08051 RGNP with a t = 60.9 and an $R^2$ of .995. Plugging in the Administration's anticipated real GNP for 1981 of $1497 billion, projects 1981 manhours at 169.24 billion. Budget Revisions . . . , p. 13.

20 Real natural GNP, the level that does not disturb the existing inflation rate, grows at about 3 percent a year (Gordon, p. 370). Adjusting 1981 real GNP by that factor gives a base 1982 real GNP with which to compute a base figure for manhours worked in 1982 using the equation from the previous footnote. Adding .27 percent to that and multiplying by the nominal output per manhour for 1981 ($2920/169.24) of $17.25 gives the net extra output available in 1982 measured in 1981 dollars. Expanding that by the Administration's predicted 8.3 percent inflation rate for 1982 gives net added output that year of $8.72 billion in current dollars.

$$MH_{1982} = 48717 + 0.08051\ (1.03)\ RGNP_{1981} = 172.86$$

$$\Delta PQ_{1982} = (172.86\ MH)\ (1.0027)\ (\$17.25/MH)\ (1.083) = \$8.72\ billion$$

21 With an additional 10 percent tax cut in 1983, the total of 20 percent should add 0.54 percent to the manhour trend of that year, while adding 0.81 percent with the final 10 percent cut in 1984. Apply those factors to the base manhour total, multiplying by the 1981 price-level-GNP per manhour, inflating at the projected inflation rates of 7 percent in 1983 and 6 percent in 1984, and adding permits computation of the aggregate addition to current dollar GNP over the 1982-1984 period shown below.

1. $MH_{1983} = 48.717 + 0.08051\ (1.03)^2\ RGNP_{1981} = 176.58$

$$\Delta PQ_{1983} = (176.58\ MH)(.0054)(\$17.25/MH)(1.083)(1.07) = \$19.06\ billion$$

2. $MH_{1984} = 48.717 + 0.08051\ (1.03)^3\ RGNP_{1981} = 180.42$

$$\Delta PQ_{1984} = (180.42\ MH)(.0081)(17.25/MH)(1.083)(1.07)(1.06) = \$30.97\ billion$$

(21 continued)

3. $PQ_{1982}$ (see previous footnote) = $8.72 billion

$58.75 billion

22 Program for Economic Recovery: Message from the President of the U.S., U.S. Government Printing Office, Washington, D.C., February 18, 1981, pp. 244-45.

23 Murray L. Weidenbaum, Business, Government, and the Public, 2nd Ed. (Prentice-Hall: Englewood Cliffs, NJ: 1981), pp. 342-344.

24 For a basic treatment of this point see Gould and Ferguson, Microeconomic Theory, 5th Ed. (Irwin, Homewood, IL, 1980) Chapter 10.

25 Weidenbaum, op. cit., p. 83, p. 98.