DEFICITS, INTEREST RATES, AND MONETARY POLICY

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I. The Deficit Syndrome

The deficit of the federal budget dominates attention of the public arena. The process began with President Carter's ill-fated budget announcement in February 1980. The response of the bond market revealed at the time the public's increasing doubts and apprehensions about the course of fiscal policy. Concern about the deficit approached a feverish pitch since 1982. Wall Street "economists," senators, congressmen, pundits, and the media in general attribute to the budget deficit an array of dismal effects. We heard in 1982 that the deficit would obstruct any incipient recovery. This prediction has been thoroughly falsified within the first four quarters of the upswing. So it was replaced by a new prediction. The deficit is supposed to halt the recovery in the near future and push the economy into a new recession. The deficit threatens us moreover with higher inflation. A direct link seems to be asserted connecting inflation with the deficit. Lastly, the deficit seems to be the cause of double-digit nominal interest rates and the highest real rates since the 1930s. Such interest rates produce apparently an "overvalued dollar" encouraging imports and lowering our exports. This pattern reduces, so we hear, our welfare, as it lowers domestic employment and output below the otherwise achievable level. And the close interdependence of national capital markets transmits the effects of the "high interest policy" pursued by the U.S. government, represented by a "loose" fiscal and "tight" monetary policy, to all major nations. This vision offers European officials an excellent opportunity to blame U.S. policy for their economic troubles.

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The public arena seems to find this story plausible. But many beliefs are "plausible," and economic analysis nevertheless offers no support for these fashionable and contentious inventions. Policymaking guided by this political vision of our economic problem will at best shift the nature of the problem with little improvement in our future economic prospects. Thus, at this stage clarification of the nature of the issues associated with the budget deficit seems particularly urgent and important. We may immediately dispose of the most egregious error without long arguments. We can assert with some categorical definiteness that deficits per se do not create inflation. It should be noted that the "disinflationary phase" of the past four years occurred concurrently with the largest peacetime deficits ever observed in U.S. history. Most particularly, our inflationary experience of the last 18 years was not caused by the deficit. Similarly, neither economic analysis nor empirical evidence support the contention that high interest rates raise the exchange rate or that deficits produce recessions.

The wide array of mistaken beliefs and misconceived apprehensions obscures, unfortunately, the real problems associated with the budget and the deficit. This paper addresses some of these problems. Section II emphasizes the significance of the budget irrespective of the deficit and stresses the need for an economically relevant measure of the deficit. The following section examines the economic relevance of the stock of real debt. Section IV explores the relation between the deficit and interest rates. The "anatomy" of interest rates in section V further investigates the (indirect) channels linking deficits with interest rates. Lastly, the long-run effect of a deficit policy on the monetary regime is examined in section VI.

II. The Importance of the Budget

Economic analysis offers little support for the single-minded attention concentrated on deficits. In contrast, it informs us that fiscal policy exerts in various ways substantial real effects on output and the formation of human or nonhuman capital. We need to look beyond the budget deficit at the whole fiscal policy pursued by the government.

The ultimate fiscal instruments affecting the economy are the magnitude and characteristics of expenditures on goods and services, the pattern of the effective tax schedule including both positive and negative taxes (i.e., transfers), the true value of the government's liabilities, and possibly the true value of the government's assets. A systematic investigation of the government's effect on asset markets and resource allocations attends to all those dimensions beyond the

officially measured deficit. An analysis directed to the long-term implication of fiscal policy, moreover, should remove purely cyclic components among expenditures and revenues. The cyclic components probably contributed recently to raise the measured deficit. The inflation tax imposed on outstanding government liabilities is, on the other hand, usually omitted in the standard accounting measures. This tax reflects the implicit revenue accruing to the government as a result of the inflation-induced real depreciation of nominal liabilities. The rate of inflation is the tax rate and the stock of real-valued debt the tax base. Such an adjustment in the deficit is unavoidable whenever we wish to obtain an economically significant measure. Long-run effects of the deficit are, if they occur at all, transmitted via changes in the stock of real debt and the composition of real wealth. Changes in the *real* value of debt are thus important in this context. A correct measure of the current (real) deficit expressed as the change in the real value of debt must subtract, beyond the ordinary tax revenues, also the inflation tax from total government expenditures. A proper measure of the nominal deficit is then obtained by multiplying the real deficit with the current price level. This corrected measure is below the official measure by an amount equal to the current inflation rate multiplied by the outstanding nominal debt. This point will be made more explicit in section VI.

The listing of the government's liabilities is not exhausted by its official debt. Pensions, the social security system, and various guarantee schemes impose commitments for future outlays on the government. The present value of these commitments is a political and economic fact just as real as the official debt. It is noteworthy in this context that the apprehension on the political and media market, or Wall Street, seems not to include the economic reality of "unfunded liabilities."

Probing beyond the official measure of deficits alerts us to the real significance of fiscal policy. Decisions bearing on spending and tax schedules modify the allocation of our resources and the normal level of output. Different fiscal choices affect the division of output between investment and consumption. The incentives or disincentives associated with spending patterns and tax schedules affect savings, investment in productive capital (both human and nonhuman), and socially nonproductive investment in the political process. The latter increases with the magnitude of spending and the complexity of tax schedules. These effects occur independently of the deficit and powerfully condition our economy. The attention concentrated on the deficit alone thus obscures to a large extent major problems associ-

ated with budget policies. The distortionary character of taxes with the corresponding welfare losses implies that a persistent deficit is not necessarily inferior to *any* tax increase. But distortionary consequences of fiscal policy in the use of real resources are not confined to taxes. The government's expenditures produce similar effects. The welfare losses resulting from expenditure programs can occasionally exceed, as in the case of Great Britain, the welfare losses associated with taxes. Controls over the magnitude and nature of expenditure programs emerge with an importance beyond "the need to lower the deficit." The consequences of expenditures irrespective of their financing deserve more informed attention in the public arena.

III. The Relevance of the Debt

An overview assessment of fiscal policy outlined in the previous section suggests the occurrence of separate welfare losses traceable to taxes, expenditures, and deficit finance. The first two strands of possible (and probable) welfare losses are generally accepted in economic analysis. But the last was seriously disputed over the past 10 years. The "Ricardo theorem," recently revived by Barro with an extensive and subtle analysis, denies that the mode of financing the budget exerts any significant real effects. The argument is essentially based on an infinite intertemporal budget constraint of households and government. The "unrealistic" assumption of infinitely living households is made operationally significant with the empirical hypothesis of intergenerational altruism. The welfare of each generation includes with its own immediate position also the future welfare of its descendants. This framework includes additionally a crucial assumption to the effect that economic agents fully anticipate with certainty that government borrowing will be repaid from future tax revenues based on lump sum taxes. Current borrowing is thus equivalent to future tax liabilities and the present value of these tax liabilities is equal to the current value of borrowing. The (infinite) intertemporal budget constraint thus implies, under the circumstances, that the division of current budget finance between borrowing and tax revenues does not affect the public's real consumption pattern. Reliance on borrowing calls forth, in view of the anticipated tax liability, a matching increase in the public's saving. Current deficits thus involve, according to the Ricardo-Barro analysis, a redistribution of tax revenues over time. By fully discounting these time shifts the public's behavior essentially offsets the government's fiscal action. Real consumption and real interest rates, consequently, are unaffected by the government choice of financing current expenditures.

An alternative analysis denies the equivalence of current borrowing and future tax liabilities. The rejection of the "intergenerational altruism" hypothesis suspends the link between current borrowing and future tax liabilities embedded in the "infinitely living household" represented by an infinite intertemporal budget constraint. Increased future tax liabilities due to current debt finance are not offset under the circumstances by compensating private saving involving an intergenerational wealth transfer. Government debt does exert a wealth effect in this case and real debt will influence real interest rates and other real magnitudes.

The hypothesis of "intergenerational altruism" is grounded on the empirical observation of bequests made by the older to the younger generation. But bequests and even operating bequest motives are consistent with intergenerational selfishness (Brunner 1986; Bernheim, Shleifer, and Summers 1985). Bequests may dominantly occur as a component in an intertemporal and intergenerational exchange. The older generation offers potential bequests in exchange for current attention by the younger generation. This analysis appears to survive observation somewhat better than the intergenerational altruism hypothesis. There exists under the latter no good reason why the older generation should concentrate, as the facts indicate, their intergenerational wealth transfers on bequests. Intergenerational altruism simply implies the occurrence of wealth transfers, but the form of the transfer is irrelevant under the hypothesis. It could just as well occur in the form of gifts as in the form of bequests. But bequests dominate the transfer, a fact well explained with the aid of "bequest-motivated intergenerational selfishness."

The real consequences of debt financing associated with the rejection of the "Ricardian thesis" and its explanatory hypothesis do not exhaust the effects of a deficit. Recent discussions surveyed in my paper on "Fiscal Policy in Macro Theory: A Survey and Evaluation" (1986) examine the effect of various risks affecting agents under a deficit policy. Uncertainty of future income and future tax incidence associates real effects with the deficit. Uncertainty about the nature of future taxes conditions moreover the risk embedded in current portfolios. There is no particular reason to expect that this risk is perfectly diversifiable. On the contrary we need to expect that apart from the risk of particular assets the diffuse risk of future tax liabilities will also modify the net return on "safe" assets anchoring the return structure according to the capital asset model. The resulting adjustment in returns and asset values would modify the division of output between consumption and investment.

IV. Deficits, Debt, and Interest Rates

The previous section concluded that deficits do probably affect interest rates both via the consequences of debt finance and the portfolio risks produced by an uncertain future tax incidence. The mechanism linking deficits with interest rates, however, needs some attention. Two alternative hypotheses with very different implications confront us, one dominates the views of the public arena and the other emerges from economic and finance analysis.

The arguments advanced in the public critique of deficits involve a direct link between current savings, current deficits, and the emerging interest rate. The real interest rate in particular is seen to be determined by a "collision" between supply flows of funds expressed by savings and net foreign capital imports and demand flows made up by the government deficit and the private sector's real investments. This view is clearly presented in the 1984 *Economic Report* prepared by the Council of Economic Advisers. Dr. Emminger, former president of the Deutsche Bundesbank, used this argument in public statements. The media and "Wall Street" dominantly interpret our financial affairs in terms of this argument. It appears to explain plausibly how a larger borrowing requirement by the government sector competes with the private demand for a scarce flow of investable funds supplied by households and foreigners. This competition must be resolved by the rationing function of interest rates. Larger deficits thus raise immediately the level of interest rates. This vision implies moreover that interest rates, once adjusted to a current deficit, will not be influenced by any further repercussions even by a large and persistent deficit. But interest rates are supposed, under the circumstances, to reflect sensitively and immediately the relative magnitude of the *current* deficit.

The plausible appeal of this view in the public arena is unfortunately not justified by economic analysis. We possess here a common professional core unaffected by Keynesian and monetarist disputes about macro-analysis. Our problem reaches actually beyond the bond market. It involves basically the nature of the pricing process of durable objects with comparatively low transaction costs. The prices of such objects formed at any given moment on the market are not determined by a flow of new production encountering a flow of new demands. A price determined in this manner would hardly persist beyond the shortest moment. The low transaction costs enable holders of already existing objects to change their existing possession at any time. A price determined by demand and supply flows generates, under the circumstances, responses among the prior holders of objects.

These responses together with the inherited stock of objects determine at any moment the prevailing price. This applies in particular whenever the existing stock is large relative to the new production flow. Prices in markets for durable objects with comparatively low transaction costs are thus controlled, not by flows of new production and a corresponding pro-rata allocation of savings, but the interaction between the accumulated stock and the public's willingness to hold this stock. Stock demand and stock supply and not a (new) flow demand and (new) flow supply, determine the current price. The prices of GM shares or of any other shares are consequently not determined by the interaction between new issues and a partial allocation of current savings. Share prices are determined at any moment by investors' willingness to hold the outstanding stock. The same situation describes the bond market, the foreign exchange market, and many commodity markets.

The public's stock demand depends on current and expected future market conditions. Stock demands are in general quite sensitive to expectational states expressing prevalent information and beliefs. Durability of objects and low transaction costs offer expectations substantial room to operate. Keynes recognized this phenomenon quite clearly. He emphasized in particular that a larger variance of expectational patterns raises the transaction volume associated with given price changes, whereas a very small variance of expectational states may produce large price changes at a vanishing transaction volume.

This analysis of a "stock-dominated market" contrasts sharply with the vision of a "flow-dominated market" encountered in the public arena. Some important differences should be noted at this stage. Our intuition immediately alerts us to crucial distinctions in relevant proportions or orders of magnitudes. The proportion of the deficit looms in the context of the flow analysis with an impressive magnitude. This fact was carefully noted in the Council of Economic Advisers' 1984 *Economic Report*. The direct link between deficits and interest rates thus suggests a massive effect on nominal and real rates of interest. The stock analysis conveys a very different sense. Deficits modify interest rates only indirectly. They gradually increase the stock of real debt and interest rates respond to this increase in the stock. But this increase in the stock relative to the inherited stock is modest compared to the savings-deficit proportion. We should expect therefore a smaller impact on interest rates by deficits than is typically suggested by a flow approach.

Closely associated with these aspects bearing on orders of magnitude is an important difference between transitory and permanent

deficits. A temporary deficit, recognized as such by market participants, produces a negligible effect on interest rates according to the stock analysis. The flow analysis implies on the other hand a substantial rise of interest rates for the duration of the deficit. A permanent deficit produces according to the flow analysis a permanent, once-and-for-all increase of interest rates to a higher level. The stock analysis produces in contrast also a different implication on this point. A permanent, large deficit implies a persistent increase in the stock of real debt per unit of real income, provided inflation remains sufficiently low. This persistent increase produces not just a once-and-for-all rise of interest rates but initiates a persistent upward drift over time in the real rate of interest. A stock analysis thus suggests that the *shorter-run* aspects of a deficit policy pose no serious economic threats. The longer-run implications of a permanent large deficit persistently raising real debt per unit of real income loom on the other hand more seriously than indicated by a flow analysis. These aspects will be examined in greater detail in section VI.

But what is the evidence about the comparative status of the flow and stock analysis? We do know from ample observation that most transactions on "auction markets" (i.e., markets for durable goods with low transaction costs) are associated with shifts in existing portfolios. This fact cannot be reconciled with a flow analysis. A report prepared by the Congressional Budget Office (1984) summarizes the findings of 24 studies. The results are very mixed and offer no ground for a systematic link between current deficits and interest rates. A recent paper by Evans (1985) examines in some detail the possible effects of current deficits on interest rates. The author finds no support for the assertion that deficits raise interest rates.

Much work in the field of finance reinforces the analysis of a stock-dominated price formation on "auction markets." The effects of new information on prices examined in event studies reflect the operation of a mechanism involving an interaction between stock supply and stock demand. These effects cannot be reconciled with a (net) flow approach to price formation in these markets. The (net) flow approach suffers a similar problem when we consider short-run price behavior. Shares and bonds are exchanged and prices formed in the absence of new issues. Neither of these observations can be reconciled with the flow approach. Both phenomena require for a useful explanation a stock approach with its expectational emphasis based on shifting information and beliefs.

V. The Anatomy of Interest Rates

The links between the deficit and market rates of interest require more detailed attention, including some sense of relevant orders of

magnitude. For our purpose the nominal rate of interest is partitioned into a sum of three components: the basic real rate on default, risk-free government securities; a risk premium reflecting the market's uncertainty about the future course of monetary policy and, thus, the profile of inflation; and lastly, the inflation premium expressing the market's expectation of the inflation rate. The sum of the first two components constitutes the gross real rate of interest. The argument developed here and in section VI indicates that a persistent deficit may be expected to affect nominal interest rates via all three components. But the popular view based on the flow analysis thoroughly fails to comprehend the nature and magnitude of these effects and their relevant mechanisms.

According to Fama (1975), the basic real rate on long-term government bonds averaged about 2.5 percent for most of the postwar period until the early 1970s. This level may be applied as a benchmark to a 1960–64 base period used as a comparison with the current state. We first need an estimate of the effect on the basic real rate attributable to permanent deficits. This permanent deficit is specified as the cumulative stock effect expected by the market over a five-year horizon. Suppose under the circumstances the market expects the stock of real debt to double over this period. The response of the real rate of interest to the increase in the stock of real debt, discounted by the market's expectation to the current interest level, depends on the elasticity of the real rate with respect to the real debt. The asset market analysis, which I have jointly developed over the past decade with Allan Meltzer, implies an elasticity of about 0.6 when supplemented with appropriate structural order constraint. Under the circumstances a 100 percent rise in real debt would raise the basic real rate from 2.5 percent to about 4 percent. In the context of our existing uncertainty bearing on these issues the estimate offered should be understood to define an upper bound. The "Ricardian" estimate of a zero elasticity determines a lower bound.

The second component (i.e., the risk premium) was probably quite negligible in the 1960s. But it emerged in recent years as a significant component of the gross real rate of interest. The announcement of a move toward tighter monetary control in October 1979 was actually followed by a large and pervasive uncertainty concerning the future course of monetary policy. Federal Reserve officials repeatedly supplied conflicting signals and statements. The variance of monetary growth increased and the motion of the money stock approached a random walk. The market responded to this deep uncertainty about the future prospects of inflation with a lower level of bond prices. A risk premium thus became embedded in the gross real rate of interest

reflecting the purchasing power risk associated with securities expressed in terms of fixed nominal values. Mascaro and Meltzer (1983) estimated this risk premium to be about 2–2.5 percent. Bomhoff (1983) estimated the premium independently at about the same level. The gross real rate thus adds up to about 6–6.5 percent. The remainder of about 5.5–6 percent constitutes the inflation premium. The link between the three components and the deficit can now be characterized with the aid of Table 1. It offers an interpretation for the difference observed between the early 1960s and the early 1980s.

TABLE 1

PARTITIONING THE NOMINAL RATE OF INTEREST

Period	Nominal Rate	Basic Real Rate	Risk Premium	Inflation Premium
1960–64	4	2.5	0.5	1
1983	12	4	2–2.5	5.5–6

Table 1 is not presented with any sense of precision or detailed reliability but it does convey a general sense about the anatomy of interest rates. We should particularly remember that our elasticity estimate for real rates is most probably an upper bound defining the range of our uncertain knowledge. We learn thus that the current effect of a large anticipated increase in the stock of real debt explains at most 1.5 percentage points of the 8 percentage point difference between 1983 and the early 1960s. The *current* deficit thus fails completely to explain both current nominal and real rates. The *permanent* deficit may explain via the stock effect a portion of the higher gross real rate. But even a permanent deficit of the order of magnitude specified cannot explain in terms of the real debt effect the drift from 4 percent to 12 percent in the nominal rate of interest.

A deficit expected by the market to persist into an indefinite future modifies the nominal rate also via the risk premium and the inflation premium. A permanent deficit raises over time the likelihood of irregular but substantial monetary accommodation. We note however that past U.S. data yield no evidence for such a supposition (King and Plosser 1985). Neither do past observations from most European nations offer much support. But until recently the problem could hardly exist. The deficits during peacetime remained comparatively small. The experience of nations with large and persistent deficits does convey a warning however. Italy, Israel, Argentina, Brazil, and others reveal the potential link operated by "the monetization of the deficit." This potential link contributes to maintain, or even raise,

the level of inflationary expectations and consequently the inflation premium. The likelihood of this feedback from permanent deficits increases, moreover, whenever the stock of real debt per output unit drifts higher over time. The same pattern combined with the tradition of discretionary policymaking also deepens the pervasive uncertainty about the future profile of inflation and affects both the level and volatility of the risk premium. A *permanent* deficit recognized as such by the market does indeed influence interest rates according to our account. The mechanisms establishing the link, however, are radically different from those suggested by the popular flow analysis discussed in a previous section. Flow analysis attributes most of the higher nominal rates to a higher basic real rate. Our analysis, in contrast, attributes the 8 percentage point increase over the 1960–64 period to three factors: dominantly to the inflation premium (about 5.5–6 percentage points); secondly to the risk premium (averaging about 2 percentage points); and lastly to the basic real rate and the pure real debt effect.

It should be emphasized that the discussion of Table 1 presents a maximal possible effect for the deficit on the (gross) real rate of interest. The influence of tax policies has been disregarded thus far. But we should note that investment tax credits and accelerated depreciation substantially raised the net real returns on investments in real assets. Competitive markets would distribute this effect over all asset markets including the bond market. The operation of such an effect would lower the contribution attributable to the deficit working via the first two strands listed in Table 1. Thus, 1–1.5 percentage points could be accounted for in terms of changes in tax policy.

One more aspect needs our attention. The public discussion conveys an impression that *any* increase in the real rate of interest discourages investments and is "bad for the economy." This judgment is quite unwarranted. An increase in the marginal product of real capital simultaneously raises real interest rates and expands real investment. The rise in real rates thus signals a "good thing." The underlying productivity of real capital improves and the potential growth rate rises. The increase in real interest rates resulting from tax policies must be interpreted in this vein. Even the increase in the real rate due to the risk premium cannot without detailed examination be unambiguously interpreted to exert a negative influence on real investment. The inflation risk shaping the second component of bond yields may actually encourage some investments in real assets. This seems to have been the case for housing. Schwert (1977) established that housing offers a good hedge against unanticipated inflation. Some other categories of real assets may share to some

extent this property. The distortionary effect of nominally based taxes on profits, however, may operate to discourage investment in productive real capital in the face of an uncertain inflationary course. Under the circumstances the same underlying cause would simultaneously raise the real rate and housing investments but lower investments in productive real capital.

VI. The Interrelation Between Fiscal and Monetary Policy

The analysis of the anatomy of nominal interest rates presented here also determines the requirements for a low interest rate policy. A determined noninflationary monetary policy would lower the inflation premium by a substantial amount. But this monetary policy may not persist in the context of a permanent deficit policy. A permanent policy of large deficits measured in terms of the associated growth in real debt imposes a gradual upward drift on the basic real rate. It fosters a high and volatile risk premium and prevents the complete attrition of the inflation premium in response to expectations of eventual monetary accommodation. A noninflationary monetary policy appears thus as a necessary but not as a sufficient condition for comparatively low nominal interest rates. We also need to change our fiscal regime holding the deficit to at most a very small margin of national income.

The issue addresses the long-run interrelation between monetary and fiscal regimes. This problem appeared for the first time in the discussion of the so-called instability of bond-financed deficits in the early 1970s (Brunner 1986). Sargent and Wallace (1981) revived our interest in this matter with a different approach. They questioned the long-run survival of an anti-inflationary monetary regime when confronted with persistent deficits sufficiently large to raise the real stock of government debt relative to real national product. The problem may be explored with the aid of the government's budget constraint:

$$\overset{0}{S} + \overset{0}{B} = G + TR - TA + iS, \tag{1}$$

where S is the stock of publicly held debt, B is the monetary base, G refers to nominal government expenditures on goods and services, TR designates transfer payments, and TA tax revenues; i should be

interpreted as the average interest rate on outstanding debt. The budget equation can be translated into the following expression:

$$(2)\quad \overset{0}{s} = \overline{def} + [(rr-n) + (n - \frac{\Delta y}{y}) + (\pi - \frac{\Delta p}{p})]\, s - [(\pi+n) + (\frac{\Delta p}{p} - \pi) + (\frac{\Delta p}{p} - n)]\, b - \overset{0}{b},$$

where s denotes the ratio of real debt to real national income, b represents the volume of base money per unit of nominal national income (i.e., it is the reciprocal of base velocity), and $\overline{def}$ consists of the basic deficit ratio expressed as

$$(3)\quad \overline{def} = \frac{G+TR-TA}{Y},$$

with Y indicating nominal national product. The other signs are: rr = real interest rate, n = normal rate of real growth, y = actual output, π = expected rate of inflation, and p = the price level.

Expression (2) may be considered as a differential equation in s. A stable process requires that the bracketed expression associated with s on the right side be negative. Actual real growth $\Delta y/y$ and actual inflation $\Delta p/p$ sufficiently large would produce a negative sign. But this state is purely transitory. Over the long run relevant for this investigation the sign would be determined by $(rr-n)$, the relation between the real rate and the normal growth rate.

Two distinct states will be considered characterized by the inequalities $rr > n$ and $rr < n$. The first state implies an unstable deficit-debt process whereas the second state determines a stable process. Some subtle issues bearing on the interpretation of the two states are neglected here and discussed elsewhere (Brunner 1986). One might expect that the difference in the dynamic properties would crucially influence our problem and the major conclusion. The subsequent argument will show that this is not the case.

The relevant long-run relations may now be written as

$$(4)\quad \overset{0}{s} = \overline{def} + (rr-n)s - (\pi+n)b.$$

We note that a steady-state condition also requires that $\overset{0}{b} = 0$. This expresses the fact that the price level is fully adjusted at any time to the prevailing volume of the monetary base and b is fully adjusted

to the ongoing inflation. Under the first state (rr > n), the debt-deficit process is unstable. For any initial value $\overset{0}{s} > 0$ the real debt ratio will continuously rise with the persistence of deficits ($\overline{def}$) and low inflation. In this case the stock of real debt per unit of real income at time N satisfies

$$(5) \qquad s(N) = s_o + \frac{\overline{def} - (\pi + n)b}{rr - n} [\exp(rr - n)N - 1].$$

Under the assumption that $\overline{def} > (\pi + n)b$, the stock s grows monotonically with time N. This growth raises the real rate of interest over time in a "non-Ricardian world." Moreover, the persistent deficit and the growing real debt burden foster increasing uncertainty and doubt about the future of a non-inflationary regime. The rising purchasing-power risk reinforces the resulting drift in the real rate. Political pressures on the central bank to accommodate more extensively will also increase over time under the circumstances. Expression (4) shows that s(N) can be lowered by means of an inflationary accommodation. A rising s(N) is moreover expected according to the argument suggested above to raise the likelihood of higher π values. We may suppose for convenience an upper limit $\bar{s}$ acceptable to the political process and explore its implications. This implies according to equation (4) that the inflation rate π must satisfy $\pi \geq \bar{\pi}$ where $\bar{\pi}$ is a minimal benchmark for π depending on the upper limit $\bar{s}$ and described by

$$(6) \qquad \bar{\pi} = \frac{\overline{def}}{b} + (rr - n)\frac{\bar{s}}{b} - n.$$

The positive relation between $\bar{\pi}$ and $\bar{s}$ is immediately obvious. A persistent accumulation of the real debt burden can ultimately always be terminated by sufficiently high levels of inflation.

The last expression (6) can be used with two different interpretations according to the nature of the inequality between rr and n. With rr > n, it describes the inflation rate required to satisfy an imposed stock of relative real debt $\bar{s}$. Alternatively, with rr < n, it determines the equilibrium stock s associated with any predetermined inflation rate, i.e.,

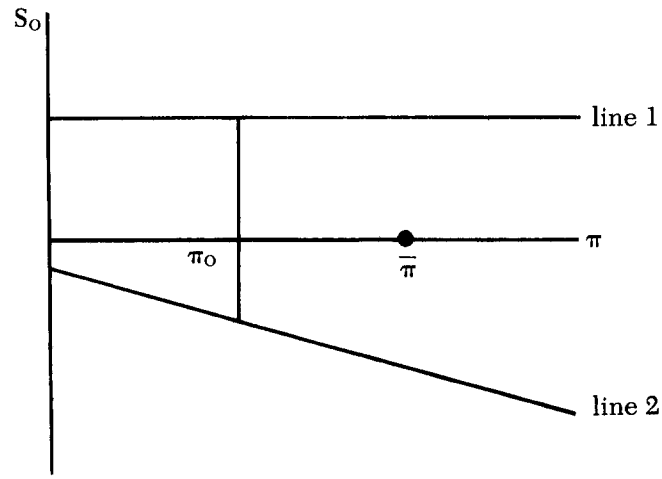
$$(7) \qquad s = \frac{\overline{def} - (\pi + n)b}{n - rr}.$$

In the first case fiscal and debt conditions dominate monetary policy and in the second case monetary policy dominates the debt position.

The difference between the two states involving the nature of the adjustment to a constant real debt ratio s can be outlined in terms of Figure 1. The horizontal line 1 represents the component $[\overline{def} + (rr - n)s]$ of $\overset{0}{s}$ and line 2 the component $[-(\pi + n)]b$. Consider now the first state with $rr > n$ and an inflation rate π_o below the inflation rate $\overline{\pi}$ required to hold s constant. This means that the vertical distance between line 1 and the π-axis exceeds the vertical distance between the π-axis and line 2. The rate of change of s is positive under the circumstances and line 1 drifts higher. This drift continues so long as the basic deficit $(\overline{def})$ is maintained and $\pi_o < \overline{\pi}$. In order to stabilize the real debt ratio s, the inflation rate needs to be raised to $\overline{\pi}$, which rises with s. As line 1 is allowed to drift upward, $\overline{\pi}$ shifts further to the right.

FIGURE 1

ADJUSTMENTS TO A CONSTANT REAL DEBT RATIO



In the second state characterized by $rr < n$, the real debt ratio s adjusts in contrast to any predetermined level π_o. Suppose the initial condition is again described by the graph. The real debt ratio s rises under the circumstances and this *lowers* line 1 via $rr - n < 0$. This process persists until the vertical distance between line 1 and the π-axis coincides with the vertical distance between π-axis and line 2.

The significance of the difference in the interrelation between the fiscal and monetary regimes apparently suggested by the previous argument dissipates however upon further examination. Table 2 reveals the problem.

A glance at Table 2 indicates that deficits of the order experienced or still expected in the United States and Europe would eventually produce—even in the context of a stable process—a massive increase in the real debt ratio beyond the current U.S. level of about .35.

TABLE 2

BASIC DEFICIT RATIO AND EQUILIBRIUM REAL DEBT RATIO UNDER A STABLE PROCESS

Basic Deficit Ratio ($\overline{def}$)	Equilibrium Real-Debt Ratio (s)[a]
.01	.40
.05	2.40
.10	4.90

[a]It is assumed that $\pi = 0$, b = .05 rr = .02, and n = .04.

Important real consequences emerge. Real rates of interest rise and output is shifted from investment to consumption. Normal growth will consequently decline. The negative difference (rr − n) may thus disappear and the economy move into an unstable debt accumulation process. The smaller (absolutely) the initial negative difference (rr − n) and the larger the permanent deficit with the implicit equilibrium real debt ratio, the greater is the likelihood of a change in the sign of the crucial inequality.

The large real debt burden associated with a 5 percent basic deficit, even in the case of a stable process, suggests that the longer-run problem confronting an independent noninflationary monetary regime should not significantly depend on the stability condition. Table 3 demonstrates this point. It summarizes the long-run inflation threat associated with persistent deficits under either state. The inflation rate is computed under the conditions that the real debt ratio (s) is held constant either at .33 or .50 and base money per unit of nominal national income (b) is constant at .05. We notice that irrespective of the stability condition (rr − n) the long-run inflation threat embedded in a permanent basic deficit of 5 percent of gross national product would move us to levels of inflation not yet experienced as a maintained phenomenon in the United States or Europe. Table 3, however, needs to be interpreted somewhat differently under the alternative cases. In the case that rr > n, the π values show the inflation required to hold s = .33 (or = .50). Under the other case we obtain an equilibrium s = .33 (or = .50) for the predetermined π-values.

The argument in this section reveals potential dangers to the political survival of a noninflationary monetary regime in the context of a

TABLE 3

PERMANENT DEFICITS AND LONG-RUN INFLATION

Basic Deficit Ratio ($\overline{def}$)	Expected Inflation Rate (π)[a]			
	if s = .33 and		if s = .50 and	
	rr > n	rr < n	rr > n	rr < n
.01	39	10	50	7
.05	139	90	150	87
.10	239	190	250	187

[a]π = inflation rate in percent per annum, b = .05, rr = .06 or .02, and n = .03.

substantial permanent deficit. The argument emphasizes that a noninflationary monetary regime and a fiscal regime of permanent deficits beyond some benchmark level are unlikely to coexist in the long-run. One of the two regimes will be adjusted to the other. A political economy approach to the underlying processes suggests that the monetary regime is the more likely to adjust and tends to accommodate the fiscal regime. A viable noninflationary monetary regime thus requires severe constraints on the fiscal regime. But we need to emphasize once more that the experience of Western nations provides thus far, with the exception of Italy and Israel, little evidence bearing on the issue discussed. There was, fortunately perhaps, no occasion for any evidence to emerge. The deficits were mostly small and the real debt burden manageable. We may have entered however a new age of permanent large deficits. But even in this context the behavior of monetary authorities did not conform well over the past few years to the story of the potential threat. It was nevertheless sufficient to generate a pervasive uncertainty about the future course of monetary policy exhibited by the behavior of financial markets. A crucial test still lies in the future. A political miracle balancing the budget may of course prevent its occurrence and confine our evidence to Latin American and Third World nations.

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THE IMPLICATIONS OF BUDGET DEFICITS

Ben E. Laden

Professor Brunner (1986) has provided a far-reaching analysis of the implications of budget deficits with a paper that covers various aspects of the question. He throws a great deal of light on the relationships between deficits and interest rates, as well as on related questions of economic growth, allocation of resources, inflation, and real rates of interest. The most important contribution of this paper is contained in the mathematical analysis presented in the last section. In an extension of the Sargent and Wallace (1981) analysis, Brunner develops a dynamic process relating the stock of federal debt to inflation, real growth, and real interest rates. This approach provides valuable insights into the implications of the deficit.

First, it demonstrates the importance of the relationship between the real interest rate and the normal rate of real growth to the stability of the financial system. When the real rate of interest exceeds the normal growth rate of the economy, which is surely an apt description of the current situation in the United States, the dynamic process is highly unstable, implying that real debt will rise relative to GNP without limit. This analysis confirms the concerns which are widely held about the current fiscal situation.

Second, Brunner's model demonstrates the inflationary implications of permanent deficits of 5 percent of GNP, which is implied by extension of the current services budget. We should not anticipate double-digit inflation; look for triple digits! The conclusion, which Brunner correctly points out, is that a noninflationary monetary policy and a permanent deficit policy cannot coexist in the long run. He concludes, and I concur, that the monetary regime is more likely to be adjusted, leading to higher inflation.

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An extension of Brunner's model to include economic growth and the real interest rate is a logical next step and a promising area of research. By adding explicit assumptions about monetary policy, fiscal policy, and growth of productive capacity, a relatively simple model that concentrates on the joint determination of the real interest rate, inflation, the federal debt, and economic growth should be obtainable. Within such a framework the implications of the deficit for real interest rates, growth, and inflation could be explored more fully within a small model whose properties easily could be demonstrated.

Brunner strongly criticizes the concerns market participants have with the deficit. I have a great deal more respect for the basic instincts of market participants. Their statements of the issues may not always be complete, but they have gone through the best learning process yet devised by man, the market which constantly tells them whether they are right or wrong. Thus I would like to offer an alternative interpretation of what worries Wall Street, an alternative that is quite consistent with Brunner's conclusions.

Wall Street is concerned that the deficits will persist. Merely looking at the current deficit is too simple. At a minimum, it is necessary to adjust for the stage of the business cycle to analyze the implications of the deficit for interest rates (Congressional Budget Office 1985). I attended a meeting in 1981 in New York at which a Treasury Department official presented graphs of interest rates and budget deficits and claimed that there was no relationship. The professional investors at that meeting realized that the relationships are more complicated, that budget deficits and interest rates are affected by other variables, particularly the stage of the business cycle. They also knew that tax changes had reduced future revenues to a degree that had not been paralleled in previous business cycles. Investors have also expressed serious concern about the implications of unfunded liabilities in medical programs and Social Security.

Investors therefore conclude that the political process cannot deal with the problem of controlling government spending. Entrenched special interests cannot easily be made to give up their benefits under a representative democracy, unless and until we can devise more effective means for budgetary control. In the end monetary policy will have to give way to the reality of inflationary pressures emanating from the fiscal regime. Monetary expansion will exceed prudent limits, ensuring serious bouts of inflation in the future.

The precise implications are unclear, but the conclusion is that imbalances in fiscal policy impart an inflationary bias to our economy that evidently cannot be resolved. Consequently, my reading of

investor concerns indicates that Wall Street would agree with much of Brunner's analysis.

The perspective of market experience, however, leads me to disagree with Brunner's view of the irrelevance of flow analysis. Brunner argues that the simple analysis that high deficits mean higher interest rates influenced market participants to overpredict the inflation rate. In fact, the biggest errors in forecasting the 1984 inflation rate were made by those who relied primarily on a monetarist approach, emphasizing links between monetary growth and inflation. This approach was misleading partly because of distortions from new kinds of deposit instruments and because of the strength of the dollar.

The flow analysis commonly used by market analysts to predict interest rates is done in a more complete flow-of-funds framework. This approach emphasizes the longer term implications of deficits, including the problems associated with a mature business cycle in which deficits persist at 5 percent of GNP. The conclusion is that inflation and interest rates will be rising, perhaps sharply, as the economy approaches full capacity utilization. The claim that flow analysis is irrelevant requires instantaneous adjustment to every kind of new information. Investment decisions are made by individuals, not computers, and the human mind is incapable of continuous analysis of all relevant variables. Consequently portfolios are influenced by the history of investment decisions, as well as by transactions costs and accounting and legal requirements that prevent or delay full adjustment.

I would also argue that when fully understood and fully specified, flow analysis is not inconsistent with stock analysis, but is rather a different way of looking at the same phenomena. However, changing expectations and uncertainties in the financial markets prevent or delay instant reflection of equilibrium stock adjustments.

Relating these thoughts to investor concerns about the deficit, investors are impressed with the fact that $200 billion deficits imply that the federal government must raise, on average, net new funds of $4 billion weekly. I have often heard the comment, "Why extend maturities now, the market will persistently be hit with new supply." The implications are often referred to by the term the "Europeanization" of the bond market. The meaning is that, as in many European countries, our market will become dominated by government issues and private issuers will only be able to sell much shorter maturities than in the past.

I contend that this already has happened. Many institutional portfolios, which used to make little use of government debt, are dominated by governments because they are the only issues that have

much liquidity in the marketplace. Private debt has been shortened considerably. In 1975–78 private issuers floated about $17–18 billion of long-term bonds of 20 years maturity or longer, approximately 70 percent of all new bonds. In 1984 only 15 percent or $10 billion of new issues were 20 years or longer (Kimelman and D'Oelsnitz). These developments could be said to describe a "collision" or a "crowding out" of private borrowers by the deficit, although this is a different sense of the term from that used by the *Wall Street Journal* in its editorials during the mid-1970s.

Finally, three additional points concerning the relationships between interest rates and deficits should have been discussed more fully in Brunner's paper.

First, the extraordinary strength of the dollar has held inflation down and has helped in the financing of strong demands for credit. Had the dollar not been so strong, might we not already be seeing the increases in interest rates and inflation associated with the imbalances in fiscal policy? And what will happen when the dollar declines? The common fears might then be quickly realized.

Second, the yield curve had a flat to negative slope throughout most of the 1980–82 period. This is certainly consistent with the conclusion that monetary policy was tight. When combined with stimulative fiscal policy there is a logical explanation for high real interest rates (Blanchard and Summers 1984). I would argue that this is a reasonable alternative to Brunner's explanation. In fact, it may only be another way of looking at the same phenomenon.

Third, the combination of budget deficits and financial deregulation creates considerable uncertainty about future interest rates. The question that arises is whether, without constraints on interest rates, the next cyclical peaks in rates will be higher than ever. On the other hand, high real rates could imply that the economy would remain weak enough to prevent extreme levels of rates. This question is a concern in the market that so far has received little attention from analysts.

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