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The Strong Dollar, the Current Account, and Federal Deficits: Cause and Effect

*By Leroy O. Laney**

The U.S. economy enters 1984 under a more desirable confluence of circumstances than in some time. A consumer recovery is under way, inflation and inflationary expectations are lower, business profits are increasing to provide an underpinning for investment, and unemployment is falling steadily.

Three factors mar this scene, however. The exchange rate of the dollar hovers around all-time highs, hurting U.S. export competitiveness. The current account of the balance of payments is in record deficit and is expected to get much worse, acting as a drag on U.S. output and jobs. Finally, the federal budget is also in record deficit. Thought by many observers to be the most serious problem facing the economy today, budget deficits may worsen in future years, risking higher interest rates and renewed stagnation just beyond the near-term horizon.

This article examines in some detail these three factors and some causal relationships among them. Does the budget deficit's influence on U.S. interest rates cause an "overvalued" dollar that, in turn, drives the current account into deficit? To what extent is the current account deficit simply an external reflection of this budget deficit, and to what extent do the capital inflows that finance the external deficit also help to finance the fiscal deficit?

Historically for the United States, budget deficits and current account deficits have occurred together relatively infrequently. Empirical investigations presented in this article show the linkage between the fiscal balance and the external balance to be much tighter for the smaller developing countries than for industrial economies, especially the United States. For advanced economies, private savings and more-developed capital markets can cushion the impact of fiscal policy on the balance of payments.

If budget deficits grow very large relative to the total economy, however, no country is immune. It seems the United States has now reached and passed the point at which the budget deficit's ef-

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fects are felt on the external side, and there are no immediate signs that a correction is forthcoming.

Exchange rate strength

Perhaps the most visible symptom recently has been the price of the U.S. currency in foreign exchange markets. It may be somewhat difficult to argue that the U.S. macropolicy mix has hurt our economy greatly until now, given recent overall economic performance. But on the international side the case is more clear-cut. An expansionary fiscal policy combined with nonaccommodative monetary policy puts upward pressure on interest rates, underpinning a strong exchange rate that drives the balance of trade further into deficit. Without the external deficit, the economy's ascent from the recent recession would have been more spectacular than it has been. The dollar's strength—its alleged "overvaluation"—has revived arguments in some quarters about appropriate policy actions for a remedy. Some of these policy recommendations, however, focus on actions other than alteration of the underlying policy mix.

After weakness that extended from 1978 through 1980, the U.S. dollar entered a period of strength in foreign exchange markets that has endured into 1984 (Chart 1). The trade-weighted average value of the dollar reached a post-1973 low in October 1978, just before the announcement of the dollar-support package that promised increased official intervention and borrowing in foreign currencies to bolster U.S. reserves. The dollar remained relatively lackluster, however, until near the end of 1980, when it began a dramatic rise that took it to record levels for the floating rate period. As 1983 drew to a close, the trade-weighted index for the currency stood over 30 percent above its level when generalized floating began almost 11 years earlier. Even after adjustment for domestic and foreign inflation since the inception of floating, the index was over 20 percent higher.

After more than a decade of floating, there continues to be an interesting absence of consensus among economists on exchange rate policy. Disregarding a still more or less maverick contingent that would opt for an international gold standard's absolutely fixed rates ("fixed" at least until countries pursuing economic policies at variance with others' find intermittent adjustments to exchange rates necessary), disagreement remains as to how much official manipulation of exchange rates is desirable or even possible. The spectrum has at one extreme those who would eschew official intervention entirely. They believe the private market is always right or at least that central bankers are no better able to conduct profitable, and therefore stabilizing, speculation than is the private market. At the other extreme are those who believe that exchange rates alternately overshoot and undershoot equilibrium levels. These individuals occasionally advocate systematic and sometimes massive official intervention to restore a more appropriate exchange rate. Those now arguing that the dollar is substantially overvalued are largely the same ones who were convinced it was undervalued in the late 1970s.

If an exchange rate overadjusts and remains away from an equilibrium level for a prolonged period, the implications are serious, even for a large economy such as the United States. Earlier in the floating rate period, there was concern that excessive exchange rate volatility would add to uncertainties of conducting international transactions and ultimately dampen world trade and financial flows. A more recent concern emphasizes short-term volatility less than longer-term basic misalignment of exchange rates. Such misalignment can give inappropriate price signals and impose serious resource reallocation costs on domestic economies. As resources are wrenched back and forth in response to inappropriate price signals, it is argued, high frictional unemployment and other costs are generated. There can also be significant spillovers into a country's trade policy, as protectionist pressures mount and artificial trade measures are advocated.[1]

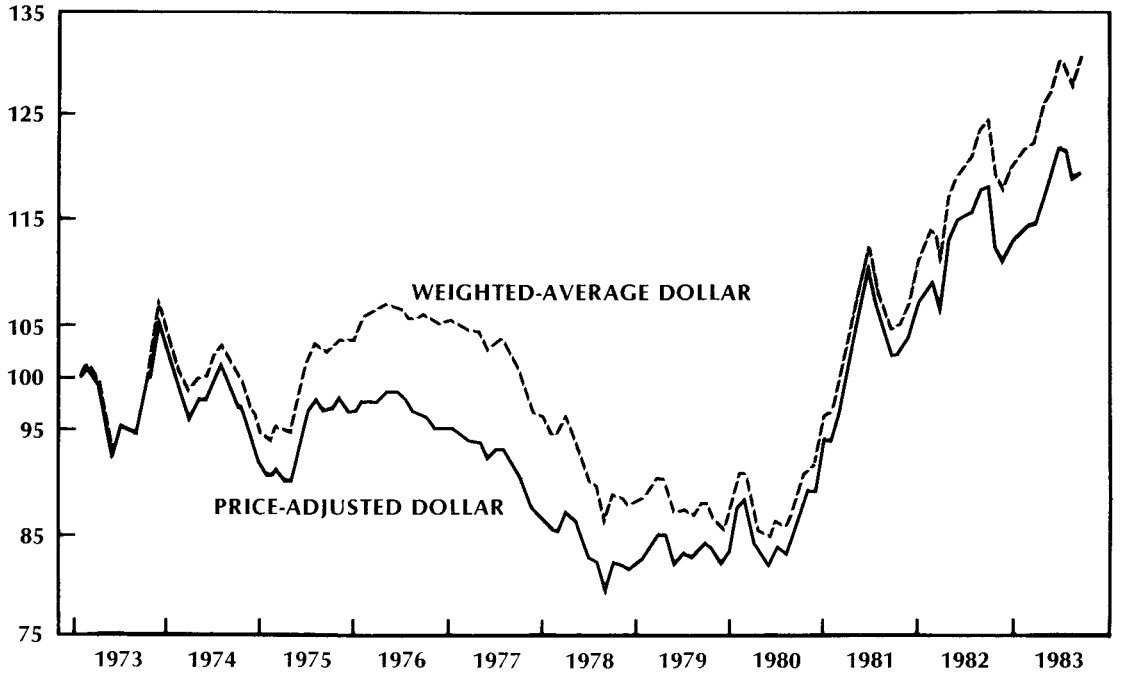
Throughout the managed floating rate period, it has usually been the policy of most central banks to "lean against the wind" in an effort to dampen swings in exchange rates, without any effort to judge whether rates are moving toward or away from equilibrium on their own momentum. Advo-

1. There is not much accumulated evidence, however, that resource reallocation costs of exchange rate fluctuations have been as great as feared by many early critics of floating. For an in-depth treatment, see Paul R. Flacco, Leroy O. Laney, Marie C. Thursby, and Thomas D. Willett, "Exchange Rates and Trade Policy," *Contemporary Policy Issues*, no. 4, Papers from the 1983 Western Economic Association International Conference (Huntington Beach, Calif., January 1984), 6–18.

Chart 1

Nominal and Real Trade-Weighted Exchange Values of the U.S. Dollar

(MARCH 1973=100)



SOURCE: Board of Governors, Federal Reserve System.

cates of a more activist posture toward intervention would point out that such leaning against the wind can actually retard restoration of equilibrium if an overadjusting rate when left alone demonstrates a tendency to move back toward equilibrium eventually.

For the past several years the United States has adopted a minimalist strategy toward exchange rate intervention, effecting a presence in the market only in extraordinary circumstances when the market is perceived to be disorderly by some definition.[2] There has been absolutely no aggressive effort to move the exchange rate to some preconceived level by intervention alone. When the United States has intervened, the scale has always been very small

2. From early 1981 through the end of 1983, the recognized Federal Reserve-U.S. Treasury foreign exchange operations were attributed to the following causes: the Reagan assassination attempt in March 1981; a European Monetary System realignment in June 1982; events surrounding an emerging international debt crisis, plus possibly other causes, in August and October 1982; upward movement in the dollar along with unsettled markets, perhaps associated with then-perceived U.S. interest rate expectations, in late July and early August 1983; and a modest purchase of yen (in coordination with Japanese authorities sensitive to international criticism about yen undervaluation), to prevent excessive weakening of that currency in response to a Bank of Japan discount rate cut, on October 31 and November 1, 1983. On each of these occasions, foreign exchange operations were quite minor compared with U.S. intervention before 1981 and relative to foreign intervention conducted concurrently during the period. See the reports on Treasury and Federal Reserve foreign exchange operations that are published in various issues of the *Federal Reserve Bulletin* each year.

relative to total flows through the market in a given period.

While the private market is usually quite sensitive to official attitudes as manifested by foreign exchange intervention, the efficacy of intervention depends on the ability to convince traders that it is profitable to join on the central bank's side of the market. A skeptical market that opposes official efforts may view those efforts as an open admission by authorities that the exchange rate has a built-up momentum in the opposite direction, so taking the other side of the market presents that most desirable of circumstances—a certain bet.

The recent official U.S. stance has been underpinned by a philosophy that while official foreign exchange operations might be useful in providing volume and reducing short-term volatility in unsettled or thin markets, they have very little long-term effect in changing the level of the exchange rate. This is especially true if such intervention is accompanied by other domestic and international macroeconomic policies that are not in harmony with exchange rate objectives.[3] To move the exchange rate to a new level in the longer run, national monetary and fiscal policies must be geared toward or at least compatible with that goal. Because U.S. intervention is routinely sterilized—that is, its effect on nonborrowed reserves is neutralized by opposite domestic open market operations—no change in overall monetary policy is encompassed in foreign exchange operations.[4]

At a superficial level, passive and activist views on intervention posture can be reconciled. It is tautological to say that the private market always sets the rate that instantaneously clears the market, and in this sense the market is always right. Those who make a case for overvaluation or undervaluation usually refer to underlying factors of exchange rate determination. These factors generally include trends in domestic and foreign money growth, income growth, expected inflation rates, real interest rates, and the balance of payments.[5] Recent empirical work has shown that state-of-the-art exchange rate models including such factors are no better at out-of-sample prediction than forward rates or a random walk, even when using actual values for explanatory variables in the post-sample period.[6] Is the dollar, then, truly overvalued by standards conventionally used to judge this issue?

The current account

Chief among the factors in the present environment that are mentioned to support a claim for dollar overvaluation is a large and increasing current account deficit in the balance of payments. Recent U.S. current account developments seem to have played very little part in dollar exchange rate behavior. The current account—which includes net investment income, tourism, transportation receipts, and some other flows as well as merchandise trade—is the most comprehensive measure of the balance of payments usually computed or analyzed in a flexible exchange rate environment.[7] This measure of the external balance, after registering only a modest surplus in 1980 and 1981, began a sharp deterioration into deficit in mid-1982 (Table 1).

The dollar did not follow the current account down, at least apparently deriving its strength

3. These views were given official articulation in the "Report of the Working Group on Exchange Market Intervention" (March 1983), a study prepared by representatives from major central banks and treasuries, commissioned by the Versailles Summit of the Heads of State and Government in June 1982.

4. Nonsterilized intervention changes the currency composition of world money, while sterilized intervention changes the currency composition of world nonmoney financial assets. If securities denominated in different currencies are perfect substitutes, sterilized intervention cannot be effective; its efficacy depends on the extent to which these assets are imperfect substitutes. This issue is not totally resolved. Some empirical evidence, however, shows that while nonsterilized intervention has a strong effect on the exchange rate, sterilized intervention has very little. See Maurice Obstfeld, "Exchange Rates, Inflation, and the Sterilization Problem: Germany, 1975-1981," *European Economic Review* 21 (March-April 1983): 161-89.

5. For a recent treatment of the development of exchange rate literature over the floating rate interval and for policy and historical perspectives, see Jeffrey R. Shafer and Bonnie E. Loopesko, "Floating Exchange Rates After Ten Years," *Brookings Papers on Economic Activity*, 1983, no. 1:1-70.

6. See Richard A. Meese and Kenneth Rogoff, "Empirical Exchange Rate Models of the Seventies: Do They Fit Out of Sample?" *Journal of International Economics* 14 (February 1983): 3-24.

7. Broader definitions of the external balance including capital flows, such as the "basic balance" and the "official reserve transactions balance," were discontinued with the advent of flexible exchange rates because they were judged to be irrelevant and sometimes even misleading in such an environment.

Table 1
U.S. BALANCE OF PAYMENTS
(Seasonally adjusted)

Item	1982 Q1	1982 Q2	1982 Q3	1982 Q4	1983 Q1	1983 Q2	1983 Q3p
	Millions of dollars						
Merchandise trade balance	-$6,103	-$5,854	-$13,078	-$11,354	-$8,810	-$14,661	-$18,169
Current account balance	564	1,434	-6,596	-6,621	-3,587	-9,655	-11,976
Net capital flows	-4,332	-9,322	-8,486	-8,036	-5,217	10,298	12,058
Errors and omissions	3,768	7,887	15,082	14,657	8,833	-644	-82

p—Preliminary.
SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

elsewhere. Of course, it is by now well established that goods markets do not clear as quickly as exchange markets. But it is useful to remember also that the overall balance of payments is an accounting identity that always sums to zero after the fact. Any current account deficit materializing in a given period must be balanced by a corresponding net capital inflow from abroad.

The array of accounts in the balance of payments tells an economist nothing about causation. It is just as easy, however, and in the short run just as correct in analyzing effects on the exchange rate, to conceive of causation running from the bottom up as from the top down. From this perspective, financial flows are not the passive reaction to an autonomous current account; rather, the current account is driven by exogenous capital flows. Capital inflows can strengthen the exchange rate, make exports less competitive abroad and imports cheaper domestically, and combine with a host of other factors to widen the current account deficit.[8] Because capital flows can be quite volatile, the exchange rate may also demonstrate short-run volatility. But even for a very long time the exchange rate may deviate substantially from a level that would balance the current account.

Capital flows are likely to be driven by economic forces that are traditionally considered in exchange rate determination. But they may originate from sources that are not captured in conventional economic models. Political instabilities as well as economic uncertainties, for example, can cause certain currencies to attract funds seeking a haven. Recently, there has been little doubt that the U.S. dollar has been a preferred currency for flight capital, particularly from Mexico and other Latin American countries. It is impossible to capture all of this capital flight in balance-of-payments transactions, but the errors and omissions account has sometimes been large enough in recent periods to finance the total U.S. trade deficit. Errors and omissions have diminished sharply, however, turning negative in mid-1983.

Although most of this statistical discrepancy is thought to be composed of unrecorded capital transactions, a substantial share may also derive from incomplete recording of some transactions belonging in the current account—yet another reason why this balance may be a misleading indicator of the appropriate exchange rate. The United States, as well as other countries, seems better able to monitor external payments on the current account than external receipts, particularly in the services component.

These measurement problems accumulate across countries. Theoretically, the sum of the current ac-

8. It would, of course, also be incorrect and overly simplistic to ignore completely the effect the current account has on the exchange rate. Over the longer haul, persistent and large current account deficits or surpluses are quite likely to cause exchange rate adjustment, even though the response may be subject to a considerable lag.

count surpluses and deficits of all countries should add to zero because the world economy is a closed system. But in 1982 no major group of countries recorded a surplus. The missing global surplus that year has been estimated to be $80 billion to $100 billion.[9] From a policy standpoint, it is worth noting that this discrepancy can lead to an overly restrictive stance globally, possibly also increasing protectionist pressure.

How undesirable overall are a strong dollar and a current account deficit for the United States? The picture is not totally one-sided. A strong dollar reflects the world's confidence in this country—a change indeed from the situation only a few years ago when private and official diversification out of the dollar as a reserve currency was a major concern.[10] A strengthening currency also means less inflationary pressure from abroad because imports are becoming cheaper in domestic terms. A current account deficit means this country is able to consume more goods and services from abroad than it exports to pay for them and also may mean less inflationary pressure because more real goods and services are entering the country than are leaving it.

On balance, however, the state of affairs is detrimental. Abnormal dollar strength hurts U.S. competitiveness, damaging some otherwise healthy industries and possibly causing inefficient allocation of real resources. The current account deficit causes the accumulation of foreign debt owed by the United States to foreigners, draining scarce capital from the rest of the world. A more appropriate role for the United States, as one of the world's wealthiest countries, is net lender rather than net borrower. Throughout most of the postwar period, this net-lender role was fulfilled while the United States usually ran current account surpluses.[11]

While causal linkages here are a slippery issue, causation appears to run more from the exchange rate to the current account than vice versa, in the short term at least. (At present, of course, other things than a strong dollar influence the current account deficit—for example, the income effects of faster economic growth in the United States than abroad.) But the coexistence of the two and the absence of clearly defined causation suggest there might be a third force underlying them both.

Federal budget deficits

There is another U.S. deficit in today's picture, the federal budget deficit. This deficit has received more attention than the deficit in the balance of payments. Recent heated policy debate has centered on the inflationary impact of budget deficits, whether it makes a difference if the deficits are monetized, whether the deficits are related to higher interest rates through crowding out of private investment in capital markets, and—perhaps foremost—the urgency and methods of reducing these deficits relative to other goals, such as low taxes and a strong national defense. Compared with the case of the strong dollar or the current account deficit, however, there is probably more agreement that the present and prospective federal deficits are unambiguously bad.

Some observers have recently alluded to a causal linkage from the federal deficit to the strong dollar and the current account deficit.[12] The argument generally runs as follows. Actual and expected large budget deficits cause relatively high real interest rates in the United States, which strengthens the dollar. Dollar strength, in turn, exacerbates the cur-

9. This global discrepancy can result from timing as well as the fact that certain transactions escape the record. The lapse between exporting-country shipment and importing-country receipt can lead to distortion in periods when world trade values are changing rapidly.

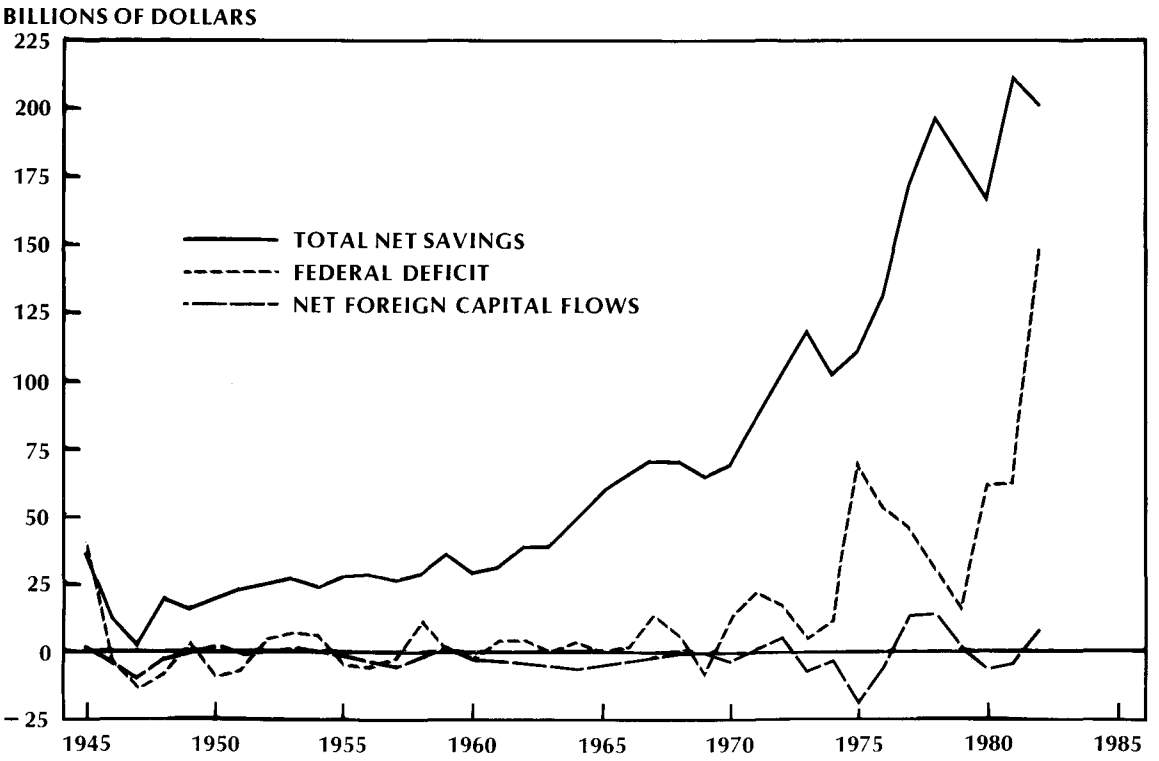
10. See Leroy O. Laney, "A Diminished Role for the Dollar as a Reserve Currency?" *Voice of the Federal Reserve Bank of Dallas*, December 1978, 11-23.

11. The role of the United States as the world's principal reserve currency country has always made likely a short-term capital inflow over time as foreign countries accumulate international reserves. Earlier in the postwar interval, a typical configuration was a current account surplus combined with a larger long-term capital outflow. The resulting balance-of-payments deficit, financed by short-term inflows, occasionally gave rise to charges that the United States was able to exploit its seigniorage advantage—that is, to run a secular payments deficit to satisfy the world's growing demand for international reserves. But on the capital account alone, the United States as reserve center provided liquidity to the world by functioning as a global intermediary, borrowing short and lending long.

12. See, for example, *Economic Report of the President, February 1984*, together with *The Annual Report of the Council of Economic Advisers* (Washington, D.C.: Government Printing Office, 1984).

Chart 2

Net Foreign Capital Flows, U.S. Budget Deficit, and Total Net Savings



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

rent account deficit. The current account deficit is therefore the mirror image of the domestic budget deficit, with foreign capital inflows to finance the former also helping to finance the latter.

It is important to note several things about these relationships over the long haul. First, it would require a massive current account deficit indeed to take much of a bite out of federal financing needs, even if foreign flows are important at the margin. As a source of net savings in the United States, the net foreign capital inflow is usually relatively small (Chart 2). Net private savings, followed at some distance by the state and local budget surplus, provide the bulk of overall U.S. net savings. The contribution from abroad not only is typically much smaller than either of these two but also is frequently negative, corresponding to an external payments surplus. A net capital outflow from this country has prevailed in most postwar years. As a use of net savings, on the other hand, the federal deficit has become quite significant recently.

A somewhat different picture is shown by the foreign-held share of total outstanding Treasury debt, 12.5 percent at the end of 1982.[13] But this substantial share is larger than the contribution usually made by net foreign inflows in any given period. Of the total foreign share, the largest proportion is held by foreign central banks and other

13. Larger shares were held by domestic households (24.4 percent) and government trust funds (17.5 percent). Approximately equal shares were held by Federal Reserve banks (11.7 percent) and commercial banks (11.2 percent).

official monetary authorities. The foreign share grew significantly during the 1970s, with official dollar purchases by monetary agencies of the oil-producing countries as well as by central banks of industrial countries. It was suggested in the 1970s that energy-related developments increased the demand for dollar-denominated instruments by redistributing wealth to oil-producing countries that have higher net saving. This impact is likely to be more important in times when these countries accumulate reserves from oil price escalations. A major rise in oil prices is not in the present scenario, nor is it a near-term prospect. Official purchases by industrial countries are much more prevalent when the dollar is falling, as major-currency countries seek to moderate the rise of their currencies against the U.S. monetary unit.[14]

A second observation deals with the role of deficits in inflationary expectations. Looming huge deficits may presage high nominal interest rates but not high real ones because if deficit-associated inflationary expectations mushroom, real interest rates might not be so high. And experience has shown that it is real interest rates that are important in influencing the exchange rate. It may be believed that budget deficits are not inflationary in themselves, and apparently one must also have faith that they will not be indiscriminately monetized. The adoption several years ago of a more disciplined monetary stance by the Federal Reserve, plus the Fed's vocal opposition to future deficits, probably does help underpin an assumption that excessive monetization is not forthcoming. But it is a crucial assumption. The longer-term historical record suggests that exchange rate behavior and expectations can be very sensitive to central bank independence from the government agency that sets fiscal policy.[15]

A third point, returning to the causation issue, relates to the earlier discussion of current account-capital flow causation. If fiscal deficits cause balance-of-payments deficits, a country does not have a capital inflow because it has a current account deficit; it has a current account deficit because it has a capital inflow, and it has a capital inflow because it has a budget deficit. Simultaneous occurrence is of little general use in determining causal direction, as always. Resort to a national income accounting framework helps illustrate this.

Where, as traditionally defined, Y is gross national product, C is private consumption, I is private investment, G is government expenditures, X is exports of goods and services, M is imports of goods and services, S is private savings, and T is government taxation:

$$(1) \quad Y = C + I + G + (X - M) = C + S + T.$$

Then, rearranging terms,

$$(2) \quad (M - X) = (I - S) + (G - T).$$

The external deficit must equal the difference in private investment and private savings plus the difference in government expenditures and taxation, the fiscal deficit.

If causation always runs unidirectionally from the fiscal deficit to the external deficit, from the government sector to the foreign sector, then the private sector surplus or deficit must be stable over time. While this is a rather heroic assumption when savings and investment functions are viewed in a Keynesian framework, the relationship between the fiscal deficit and the external deficit can be tested by estimating

$$(3) \quad (M - X) = \alpha + \beta(G - T),$$

where the constant term α represents $(I - S)$.

It is impossible, however, for this causal relationship to hold for all countries. This can be illustrated with a theoretical two-country world, composed only of Countries A and B. Assume that in Country A the budget deficit is transmitted to the external balance:

$$(4) \quad (M_a - X_a) \leftarrow (G_a - T_a).$$

14. This mechanism provides a source of current account deficit finance in such periods. Because the current account responds to a depreciating dollar only with a lag (initially, the falling currency may only increase import values and decrease export values, volume changes coming later), this finance may be needed. But if large enough, official foreign inflows could indeed help retard the dollar's fall, as intended.

15. See, for example, Joseph Bisignano, "The Lesson of Poincaré," *Weekly Letter*, Federal Reserve Bank of San Francisco, 8 July 1983. For a cross-country survey of central bank independence that also compares and discusses the role of exchange rate behavior, see King Banaian, Leroy O. Laney, and Thomas D. Willett, "Central Bank Independence: An International Comparison," *Economic Review*, Federal Reserve Bank of Dallas, March 1983, 1-13.

But Country A's external deficit is, by definition, Country B's external surplus because global surpluses and deficits must sum to zero:

$$(5) \quad (M_a - X_a) = -(M_b - X_b) = (X_b - M_b).$$

If Country A's budget deficit unidirectionally causes its external deficit, it must be able to force this deficit on the rest of the world, here composed only of Country B. In Country B, then, causation must run the other direction. Its external surplus must unidirectionally cause a budget surplus:

$$(6) \quad (X_b - M_b) \rightarrow (T_b - G_b).$$

In a world of n countries, therefore, the hypothesized causal direction can hold for $n-1$ at most. The nth country will always be forced to conduct a fiscal policy dictated by the sum of the external balances of the rest of the world. And the fact that the relationship *cannot* hold for one country raises a question as to whether it *does not* hold for a larger number.

The real world is not so simple, of course. Actual causation is likely to be bidirectional in many countries, even though it may run predominantly in one direction or another. It is possible to hypothesize the countries in which causation runs more from the domestic to the foreign side and those in which it runs more from the foreign to the domestic side. A relatively small and open economy, for which international transactions are very important, would be more likely to have domestic developments dictated by the foreign balance. A large economy for which foreign trade is less important would probably have its external balance conform to domestic policy. Even for the smaller economies, however, it is more logical and usually more realistic to conceive of causation running from the domestic side to the foreign side.

For more-developed economies, the relationship may not hold systematically at all. The configuration of private investment and savings may absorb the effect of fiscal policy without transmitting it to the external balance.

An international survey

It is possible to examine the relationship of the fiscal balance to the external balance, as stated quite simply in equation 3 above, over a wide range of diverse countries. Results of such an investigation are subject to some rather apparent caveats. Coefficients may be biased by simultaneity, and with respect to specification there is obviously a wide array of other variables besides the fiscal deficit that would enter an equation purporting to explain more fully the movements of the current account. But the exercise at least can determine whether there is any correspondence between the two balances, and time series analysis affords the summarization of a very large amount of data. Examination of results not only can indicate the international prevalence of this correspondence but also may shed light on the kinds of countries for which it is likely to hold most strongly.

In Table 2, industrial and developing countries are grouped according to International Monetary Fund classification. Data limitations made it necessary to exclude a number of IMF member countries, but results for 59 countries in all are shown.

The fiscal balance as a determinant of the external balance is statistically significant noticeably more frequently in the developing-country group than in the industrial-country group. Even within the industrial-country group, it is in the smaller economies that the variable shows significance. Among the world's seven largest economies, only Canada and Italy demonstrate a statistically significant positive relationship. The United States evinces a negative (perhaps spurious) relationship that would be judged significant at the same statistical level if that were the test being conducted. Although simultaneity bias may vary across countries, coefficient size is generally larger for the smaller and less-developed economies, illustrating that the external balance is larger relative to the fiscal balance in those cases.

The outcomes for the smaller and developing economies are not surprising, given the common knowledge that both external deficits and fiscal deficits of these countries are frequently financed largely and sometimes almost entirely by foreign borrowing. Such countries generally do not have domestic capital markets sufficient to fund government deficits, so reflection in the external deficit is direct and systematic over time.

Even the developed economies, however, cannot rely on domestically generated savings to finance budget deficits above a certain size. What has not held systematically for them can certainly hold episodically, with threshold effects, when govern-

Table 2
RELATIONSHIP OF EXTERNAL BALANCE AND FISCAL BALANCE ACROSS COUNTRIES
$(M - X) = \alpha + \beta(G - T)$

Area	Interval	Constant	Fiscal balance coefficient	$\overline{R}^2$	DW	Rho
Industrial countries						
United States	1948–82	-5.54 (-3.47)	-.12 (-3.01)	.43	1.48	.35
Japan	1955–79	-194.62 (-.62)	-.10 (-1.53)	.12	1.42	.20
Germany	1950–82	-10.64 (-2.64)	-.31 (-1.51)	.47	1.37	.57
United Kingdom	1948–82	-.48 (-.62)	-.24 (-1.93)	.67	1.45	.75
Canada	1948–82	.96 (2.65)	.17 (2.58)*	.14	1.56	
France	1950–81	-1.10 (-.28)	.08 (.34)	.14	1.27	.32
Italy	1951–82	-148.68 (-.19)	.22 (6.39)*	.72	1.69	.32
Switzerland	1948–82	-2.56 (-3.20)	-.73 (-1.51)	.59	.93	.57
Netherlands	1950–82	-.49 (-.40)	-.40 (-3.21)	.52	1.54	.59
Belgium	1958–82	-15.84 (-1.24)	.20 (3.76)*	.83	1.47	.67
Sweden	1948–80	-.39 (-.77)	.22 (4.57)*	.38	1.68	
Norway	1954–76	-.87 (-1.21)	1.96 (10.34)*	.91	1.73	.55
Finland	1948–81	.39 (.64)	.63 (2.12)	.36	1.30	.57
Australia	1949–82	2.61 (1.32)	-.57 (-2.35)	.68	1.75	.93
New Zealand	1950–81	18.02 (.31)	.67 (6.77)*	.59	1.84	
Austria	1948–81	-1.20 (-1.07)	.49 (6.69)*	.57	1.98	
Spain	1962–82	83.62 (2.07)	.40 (4.60)*	.67	1.47	.34
Ireland	1948–82	-5.77 (-.25)	.94 (23.90)*	.94	1.62	

Continued on next page

Table 2—*Continued*

Area	Interval	Constant	Fiscal balance coefficient	$\bar{R}^2$	DW	Rho
Industrial countries—*Continued*						
Iceland	1948–81	379.23 (.91)	1.46 (.85)	.55	.48	.91
Developing countries						
Brazil	1950–81	44.26 (1.35)	-70.81 (-6.56)	.72	1.30	.34
India	1950–79	-.36 (-.11)	.18 (1.29)	.02	2.02	
Mexico	1966–80	-4.68 (-.68)	1.14 (11.26)*	.96	1.55	.58
Turkey	1967–80	.56 (.08)	.82 (8.81)*	.85	2.00	-.12
Argentina	1967–79	-3.64 (-.51)	-.24 (-3.78)	.39	2.65	-.45
Yugoslavia	1960–81	14.76 (1.41)	3.33 (2.93)*	.59	.96	.32
South Africa	1948–82	-109.95 (-.27)	.69 (1.81)	.21	1.55	.45
Indonesia	1969–82	-174.61 (-.37)	1.42 (1.79)	.19	1.46	.20
Nigeria	1965–78	118.52 (.33)	.16 (.52)	-.05	1.59	.10
Hungary	1970–82	22.42 (1.78)	-1.62 (-.74)	.09	1.81	.32
Greece	1951–82	11.47 (2.81)	.72 (8.06)*	.67	2.03	
Philippines	1957–80	2.51 (2.25)	1.47 (3.80)*	.76	1.06	.59
Thailand	1950–82	1.45 (.72)	1.32 (6.96)*	.60	1.64	
Israel	1957–80	340.49 (1.50)	1.20 (22.62)*	.96	1.72	
Pakistan	1960–81	1.42 (1.96)	.30 (3.51)*	.52	1.68	.28
Malaysia	1960–82	-1,020.98 (-1.41)	.71 (4.71)*	.69	1.31	.62
Morocco	1965–80	-.90 (-3.20)	1.00 (14.00)*	.93	1.55	
Singapore	1963–81	874.60 (4.40)	-3.69 (-3.89)	.44	1.45	

Continued on next page

Table 2—*Continued*

Area	Interval	Constant	Fiscal balance coefficient	$\bar{R}^2$	DW	Rho
Developing countries—*Continued*						
Ecuador	1950–81	1.79	1.21	.70	1.81	.35
		(2.12)	(5.90)*			
Sudan	1967–79	7.10	1.44	.75	1.89	.02
		(.37)	(5.98)*			
Guatemala	1958–81	71.20	.88	.69	2.06	.33
		(2.48)	(5.68)*			
Burma	1948–79	202.27	-.38	.54	1.86	.73
		(1.01)	(-2.13)			
Zaire	1966–81	-148.90	2.29	.74	1.72	
		(-.99)	(6.64)*			
Kenya	1964–81	146.84	2.09	.48	2.17	
		(.22)	(4.07)*			
Ethiopia	1964–78	28.51	.68	.43	1.96	
		(.87)	(3.39)*			
Sri Lanka	1950–82	-589.74	1.16	.98	1.37	.74
		(-1.17)	(19.26)*			
Tanzania	1968–79	157.69	1.25	.67	1.97	.01
		(.38)	(4.79)*			
Bolivia	1959–82	3,483.27	-.10	.34	1.90	.13
		(2.23)	(-2.52)			
Panama	1948–80	20.00	1.00	.94	1.74	.38
		(3.11)	(15.45)*			
Jamaica	1960–80	117.36	-.13	.02	2.12	
		(3.18)	(-1.18)			
Zambia	1964–79	-133.02	.34	.01	2.13	
		(-2.49)	(1.06)			
El Salvador	1954–82	75.98	1.06	.49	1.67	
		(2.14)	(5.24)*			
Nicaragua	1960–79	106.69	-.00	.17	1.04	.59
		(.26)	(-.00)			
Jordan	1959–82	52.30	2.07	.72	1.61	.32
		(2.20)	(4.92)*			
Honduras	1950–82	110.67	.72	.78	.91	.62
		(2.64)	(2.42)			
Cyprus	1966–81	13.02	1.66	.82	1.64	
		(2.47)	(8.24)*			
Haiti	1967–82	120.47	2.23	.83	2.52	
		(2.49)	(8.54)*			

Continued on next page

Table 2—*Continued*

Area	Interval	Constant	Fiscal balance coefficient	$\overline{R}^2$	DW	Rho
Developing countries—*Continued*						
Liberia	1965–81	42.06	.44	.51	1.75	.46
		(2.53)	(1.70)			
Malawi	1964–82	15.93	1.70	.72	1.48	
		(1.47)	(6.92)*			
Sierra Leone	1964–81	1.42	1.62	.95	1.79	.66
		(.11)	(9.24)*			

NOTE: Figures in parentheses are *t* statistics; * indicates significance of the independent variable at the 99-percent level, using a one-tailed test that the variable is signed as hypothesized.
$\overline{R}^2$ is the coefficient of determination adjusted for degrees of freedom.
DW is the Durbin-Watson autocorrelation test statistic. A generalized least-squares procedure was used to correct for first-order autocorrelation in cases where the ordinary least-squares Durbin-Watson statistic was not acceptable.
Rho is the first-order autocorrelation coefficient and is reported only in cases where the generalized least-squares procedure was employed.
In each case, the fiscal balance is that of the central government. The external balance includes net factor payments to and from abroad but does not include net transfer payments. All data were in units of local currency, so the constant term cannot be compared across countries.
SOURCE OF PRIMARY DATA: International Monetary Fund (*International Financial Statistics*).

ment deficits become large relative to the savings pool and the overall economy.

The United States now sees the effects of its fiscal deficit on the external side. The unified federal deficit as a percentage of gross national product has recently risen markedly (Chart 3). Under these conditions, discounting the possibility of a major increase in the private domestic savings rate, the United States can expect a continued reflection of the budget deficit in the current account deficit.

Returning to the national accounts framework for illustration, both a country's external balance and its private sector balance can be driven causally by the government balance:

$$(7) \qquad (M - X) + (S - I) \leftarrow (G - T).$$

Rising domestic interest rates, then, not only appreciate the currency and contribute to a current account deficit but also discourage investment relative to savings sufficiently that both foreign and domestic contributions are necessary to finance the government sector. The crowding-out effects of the budget deficit operate on private domestic investment as well as on exports and import-competing industries. (Should the current account deficit make its influence on the dollar felt, currency depreciation could correct the external imbalance. A continued budget deficit would then be felt mainly in the domestic economy.)

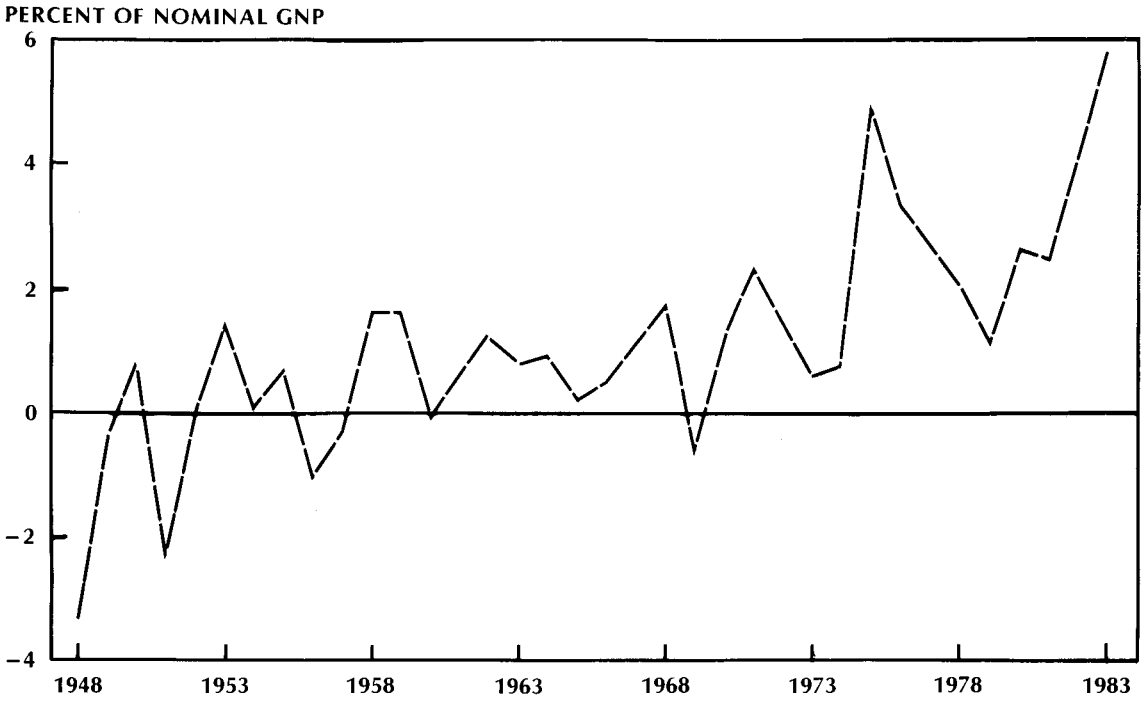
Concluding comments

The solution to dollar overvaluation suggested by this article is to continue allowing the market to set the exchange rate but to foster underlying conditions that enable the market to set a more appropriate rate. Ultimately, this can only mean reducing the federal deficit.

If the budget deficit goes on being reflected in a growing current account deficit, the capital inflows necessary to finance the latter at a constant exchange rate must also grow. Will the increased inflows be forthcoming from a world skeptical of the haven currency country's ability or determination to put its own house in order? Budget deficit reduction is a well-recognized, if still rather controversial, subject in the United States. But there is probably insufficient recognition of the international scope. The dollar could drop precipitously if potential foreign

Chart 3

Unified U.S. Budget Deficit Relative to Nominal GNP



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

inflows turn into outflows. And such outflows would at the same time exacerbate, rather than help alleviate, a domestic shortage of funds.

Finally, the fiscal approach to the balance of payments taken in this article can easily be turned into a monetary approach. The developing-country case is again a useful analogy, because insufficient domestic sources of funds put added pressure on the central bank to monetize the deficit. Fiscal deficits drive monetary expansion, inflation explodes, nominal interest rates rise while real rates drop, and the currency depreciates. In the advanced-country case, where lower deficits might be financed in domestic capital markets without monetization, add a complaisant central bank to a deficit out of control and that country moves toward the developing-country scenario.

How Fiscal Policy Matters

*By John Bryant**

In the fiscal policy of the United States, emphasis has been shifted from social programs to defense and from tax financing to deficit financing. National defense outlays, which were 23.2 percent of total Federal Government outlays in 1980, were estimated to rise to 27.8 percent of the total in the 1984 budget, according to the 1984 *Economic Report of the President*. Deficits, which have risen even more dramatically, were 10.3 percent of outlays in 1980 and were estimated to become 21.5 percent in the 1984 budget.

Do these shifts matter from a macroeconomic perspective? In other words, how do they affect our economy's aggregate production and consumption of goods and services? Of particular concern, the subject of heated debate inside and outside the Administration, is how the huge and growing deficits will affect private investment.

Of course, such issues are not just of interest now but will be important questions for policymakers into the foreseeable future. This article does not address the magnitude of the various effects of fiscal policy. Rather, it discusses the avenues through which fiscal policy influences the private sector and describes qualitatively the effects of fiscal policy.

The macroeconomic effects of fiscal policy are certainly not a new issue. In his 1821 book *Principles of Political Economy and Taxation*, David Ricardo presents an analysis implying that deficit finance is not important from a macroeconomic perspective. Ricardo goes on to suggest why this analysis does not apply in reality—why this "government irrelevance" result does not hold.[1]

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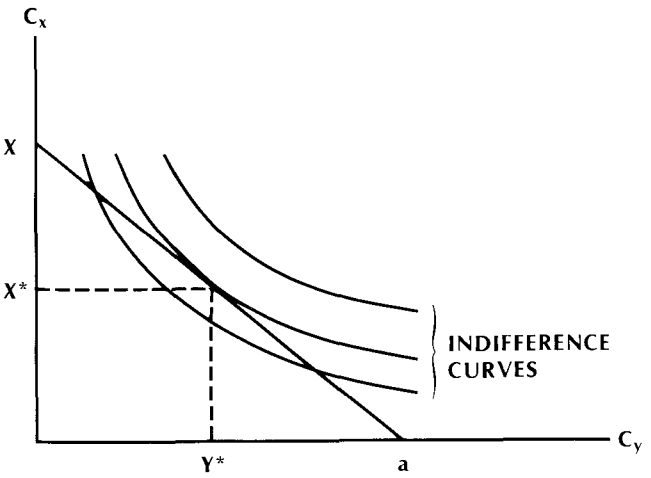
1. For discussions see, for example, Kevin D. Hoover and Joseph R. Bisignano, "Classical Reflections on the Deficit," *Weekly Letter*, Federal Reserve Bank of San Francisco, 14 October 1983, and Gerald P. O'Driscoll, Jr., "The Ricardian Nonequivalence Theorem," *Journal of Political Economy* 85 (February 1977): 207–10.

Although It seems intuitively obvious to the modern observer that the government budget is of particular importance for the economy, it is, nonetheless, instructive to follow in Ricardo's footsteps and examine the various avenues of influence of fiscal policy. Indeed, in the economics literature there has of late been a resurgence of interest in the Ricardian proposition and in broadening Ricardo's analysis.[2] This resurgence of interest is at least partly due to the increased urgency of the issues involved. The basic thrust of the recent work is to examine precisely in what respects the government is a special economic agent.

The important distinguishing characteristic of the government is that it can raise revenue through taxes, whereas businesses must ultimately rely on sales. The government is not subject to the discipline of the marketplace. Consequently, the government redistributes income and produces and uses goods and services without considering the profitability of these actions and without the consent of some of the interested parties. This explains why more attention is focused on the fiscal policy of the government than on the activities of, for example, Exxon.

It follows that fiscal policy is important because (1) taxes and transfer payments are costly to administer, (2) taxes and transfer payments reduce incentives for production in the private sector, (3) government redirects expenditures in ways that affect aggregate welfare or efficiency, and (4) private citizens may underestimate, or ignore, the future tax liability of paying off government bonds. These avenues of influence of fiscal policy are illustrated below. For the most part, the analysis implies that "expansive" government fiscal policy actually *reduces* production and investment. Moreover, this reduction is effected without an increase in interest rates.

Figure 1
Simple Production



C_x is consumption of good x, and C_y is consumption of good y. Feasible consumption bundles are represented by the straight line running from X on the C_x axis to $a=(1+r)X$ on the C_y axis. The individual chooses the feasible consumption bundle that is on the highest indifference curve, namely, $C_x=X^*$ and $C_y=Y^*$. The optimal consumption of good x is X^*, and the remainder of the endowment of good x, $(X-X^*)$, is used to produce $Y^*=(1+r)(X-X^*)$ units of good y.

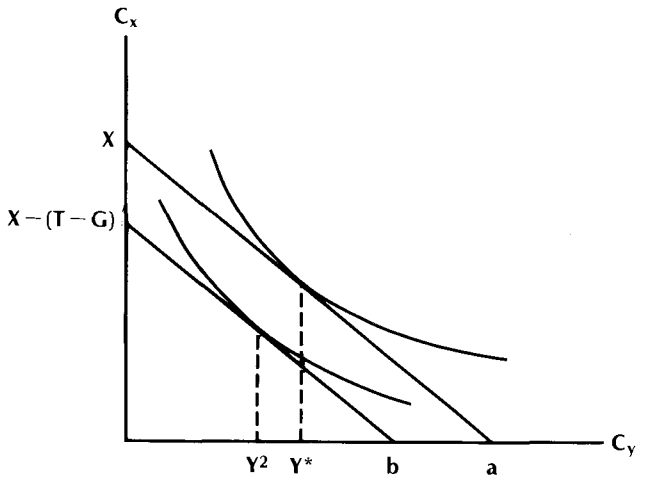
How costly administration of taxes and transfers matters

A simple model is useful to illustrate the avenue whereby taxes and transfer payments likely reduce production. For simplicity, assume an economy with fully employed resources and no money.[3] Suppose the economy consists of identical individuals. Then, an analysis of the effect of government policy on one individual leads to conclusions that can be extended to the economy as a whole. Assume there are just two goods, *x* and *y*, to permit the use of graphical analysis. Further assume each individual is endowed with *X* units of good *x* and no units of

2. Recent literature considers the "irrelevance" not only of bond versus tax financing but also of government expenditures. Some elements of this analysis can be found in Robert J. Barro, "On the Determination of the Public Debt," *Journal of Political Economy* 87 (October 1979, pt. 1): 940–71; John Bryant, "Government Irrelevance Results: A Simple Exposition," *American Economic Review* 73 (September 1983): 758–61; Joseph E. Stiglitz, "On the Relevance or Irrelevance of Public Financial Policy," NBER Working Paper Series, no. 1057 (Cambridge, Mass.: National Bureau of Economic Research, January 1983); and Neil Wallace, "A Modigliani-Miller Theorem for Open-Market Operations," *American Economic Review* 71 (June 1981): 267–74.

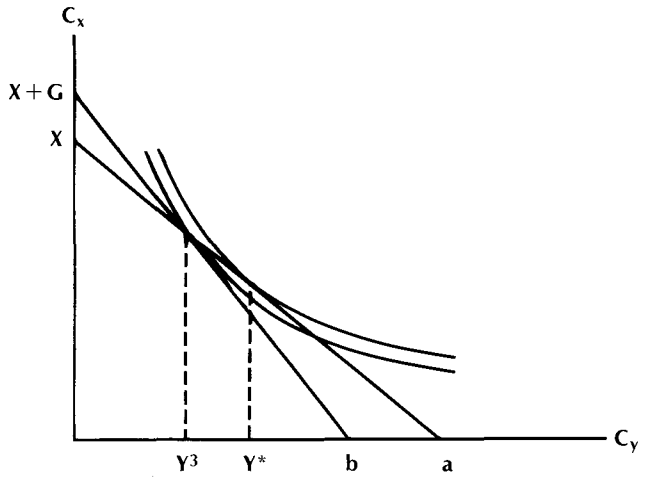
3. A more general treatment appears in John Bryant, "Banking, Recession, Depression, and Government Expenditure," *Journal of Banking and Finance* 6 (December 1982): 549–59.

Figure 2
Transfer Payments with Administrative Costs



Costly government transfer payments effectively reduce the endowment of good x by (T − G). Feasible consumption bundles are now represented by the straight line running from X − (T − G) on the C_x axis. If the goods are normal goods, this causes the individual to reduce production of good y from Y^* to Y^2.

Figure 3
Taxes and Incentives



A tax on production and a costless government transfer payment do not affect the set of technologically feasible consumption bundles, which is still represented by the straight line running from X on the C_x axis to $a = (1 + r)X$ on the C_y axis. However, the individual's perceived budget set is now represented by the straight line running from (X + G) on the C_x axis to $b = [(1 + r)/(1 + t)]\ (X + G)$ on the C_y axis. The perceived budget set must induce the individual to choose a technologically feasible consumption bundle. Therefore, to balance the government budget, t must be set so that the consumption bundle in the budget set that is on the highest indifference curve is also feasible, as illustrated. This causes the individual to reduce production of good y from Y^* to Y^3.

good *y*. However, the available technology enables each individual to transform good *x* into good *y* at the rate 1 to $(1 + r)$. From holdings of good *x*, the individual chooses the amount of good *y* to produce that maximizes her welfare. The solution to this problem is illustrated in Figure 1. In general, the individual chooses to consume some of each good.

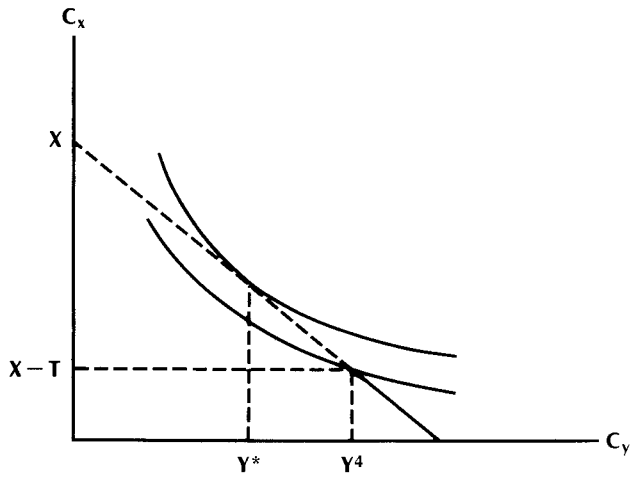
Now add government taxes and transfer payments to the example. It is a standard assumption in macroeconomics that the effects of such redistributions cancel out in the aggregate. For example, the recipient of a transfer payment increases saving by the amount that the taxed individual reduces saving. A simple way to build this feature into a model is to assume taxes and transfer payments accrue to the same individual.

Suppose the government taxes the individual *T* units of good x and makes a "transfer payment" to the individual of *G* units of good x. If this activity consumes no resources, it obviously has no effect on the individual, as *G* equals *T*. Otherwise, the individual gets a transfer payment less than her tax, so *G* is less than *T*. Effectively, the individual's endowment of *x* has been reduced by $(T - G)$, the cost of administering the program. If *x* and *y* are normal goods, this waste reduces production. This point is illustrated in Figure 2.

As a "real world" example, social security redistributes income from workers to retired people, but the program is costly to administer. The program may be viewed as taking money from a person and then giving it back to her in two respects. First, money taken from her in her working years is returned to her when she retires. Alternatively, many working-age people would, in the absence of social security, contribute more to the support of their parents. Social security thus takes money from one pocket and returns it to another. More generally, the effects of redistributing income from workers to

Figure 4

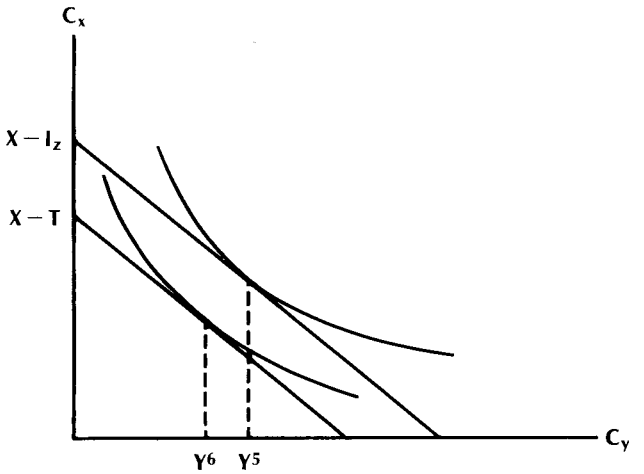
Excessive Government Production



Excessive government production of good y, $Y^4=(1+r)T$, effectively reduces the endowment of good x by T and effectively gives the individual an endowment of good y of Y^4. Because the individual would like to "unproduce" some of good y but cannot do so, she consumes $C_x=(X-T)$ and $C_y=Y^4$ and is worse off.

Figure 5

Private Production with Excessive Government Production



I_z is the optimal amount of good x allocated to the production of good z, and Y^5 is the optimal production of good y. If the government uses $(T>I_z)$ units of good x to produce good z, one effect is to reduce the effective endowment of good x. Typically, another effect is a shift in the indifference curves in the (C_x, C_y) plane as well. If the indifference curves do not shift "too much" and if the goods are normal goods, production of good y will fall from Y^5 to Y^6.

retired people may cancel out in the aggregate. But the goods and services that could have been produced with resources used up by social security administration are lost to the economy.

How taxes and transfers reduce incentives

In addition to being costly to administer, taxes and transfer payments also reduce incentives in the private sector and thereby reduce production. This can be illustrated by modifying the above example, in which taxes were simply levied on a "lump sum" basis. In that case, taxes have no effect on incentives; they only reduce income. But consider the case of a tax based on production.

Suppose the government operates costlessly. However, the government charges a flat-rate tax on the input of good *x* to the production of good *y* (or, equivalently, the government taxes the production of good *y*). This tax finances the transfer payment of *G* units of good *x*. If the amount of good *x* allocated to the production of good *y* by the individual is *I* and the tax rate is *t*, then *t* must be chosen so that the resulting input satisfies $(t\ I=G)$.

This implies that for the individual the effective rate of return of production is not $(1+r)$ but $(1+r)/(1+t) < (1+r)$. The tax reduces the incentive to produce. This, in turn, implies that the individual reduces production and is worse off (Figure 3). As a real world example, the income tax discourages work and encourages leisure.

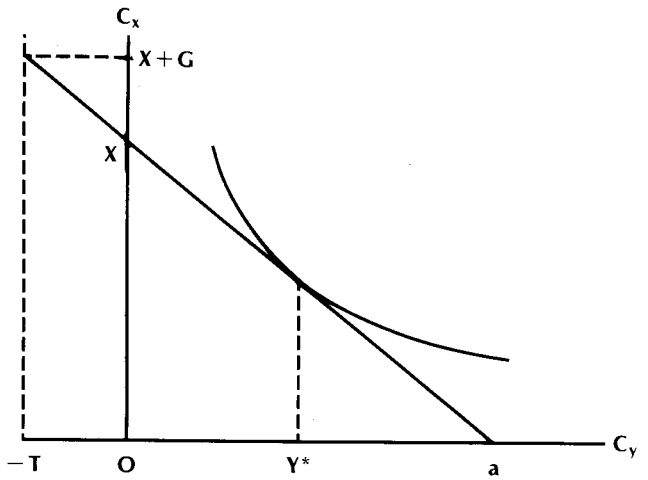
Excessive government expenditures

The discussion to this point has covered transfer payments only. Governments also engage in production, however. If the publicly produced goods can be substituted for privately produced goods, increases in government production will be matched by decreases in private production, and the additional government spending will have no macroeconomic effects. But this condition does not always hold.

For example, government may produce more of a

Figure 6

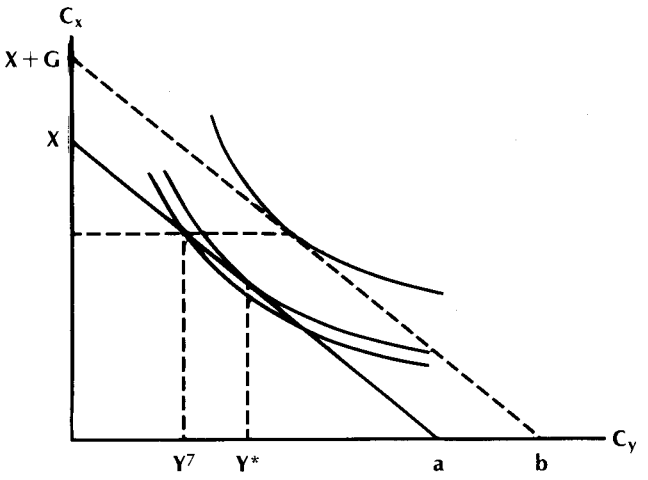
Bond-Financed Transfer Payments



A government transfer payment financed by a bond issue that is, in turn, retired by taxes effectively increases the endowment of good x by amount G and effectively gives the individual a "negative endowment" of good y of $-T=-(1+r)G$. However, by using the transfer payment to purchase bonds in amount G, the individual returns to her original endowment of X units of good x and no units of good y. Then the individual produces Y^* units of good y, as before.

Figure 7

Bonds as Spurious Wealth



A bond issue and a costless government transfer do not affect the set of feasible consumption bundles, which is still represented by the straight line running from X on the C_x axis to $a=(1+r)X$ on the C_y axis. However, if the individual ignores the tax liability of the bonds, she will think her endowment of good x increases by G but will ignore her effective "negative endowment" of good y of $-T=-(1+r)G$. Therefore, the individual's perceived budget set is represented by the straight line running from (X+G) on the C_x axis. The individual, overestimating her endowment, increases consumption of good x, if the goods are normal goods, and thus reduces her production of good y to Y^7.

good than the private sector would in the absence of government intervention. In this sense, government production may be termed "excessive." This may occur because the government is not subject to the discipline of the marketplace. The government is not constrained to engage in profitable levels of activity.

In the first example, suppose the government taxes the individual T units of good x, uses that amount of good x as input to produce good y, and then makes a "transfer payment" to the individual of G units of good y. If the government operates costlessly, then G equals $(1+r)T$. As long as T is less than the input the individual would have made without government interference, this fiscal policy has no significance. The individual simply reduces her input by the amount T and her production by the amount $(1+r)T$, and total input and production are unchanged. The government production perfectly "crowds out" private production because the government is just acting as the individual's production agent. However, if T exceeds the amount of input the individual would choose, total input rises to T, total production rises to $(1+r)T$, and the individual is worse off, as is illustrated in Figure 4.

As a real world example, the Tennessee Valley Authority (TVA) builds and operates dams that the private sector could build and operate. If the TVA dams would otherwise be built and operated by the private sector, the allocation of resources and total production in the economy are not affected by the TVA. Suppose, however, that the dams built by the TVA are larger or more numerous than the private sector could profitably build and operate. The added production of dams cannot be offset by reductions in private sector dam building. All the dams in the area are TVA dams already.

As it stands, the two-good example does not allow illustration of the effect that is exerted by excessive government production on the private production of

other goods. Suppose, however, that there is a third good in the example and it, like good y, is produced from good x. Moreover, suppose it is this third good, z, that the government is overproducing. Let the welfare-maximizing input of good x into the production of good z be I_z, $I_z < T$. If the amount of good z consumed does not influence the tastes for goods x and y[4] and if x and y are normal goods, then government overproduction of good z reduces the production of good y (Figure 5).

There may be goods that should be produced but which the private sector cannot produce—at least not efficiently. A common example is national defense. In such a case, the above analysis of excessive government production still applies, only the adjective "excessive" has to be deleted, and this government production need not make the individual worse off. It does, however, likely reduce private sector production.[5]

How bond financing matters

To discuss the final avenue of influence of fiscal policy, it is necessary to introduce government borrowing into the analysis. Governments generally borrow by selling bonds in one period and collecting taxes in a subsequent period to repay the bondholders. If in this situation individuals underestimate their future tax liability, they likely increase consumption today and reduce investment as the bonds are erroneously substituted for investment. Under this condition, bond-financed deficits do reduce private investment. This can be illustrated with a reinterpretation of the above two-good examples.

Suppose each individual lives two periods and there is one good in each period—good x in Period 1 and good y in Period 2. Under this interpretation, r is the real interest rate and production of good y is investment. Suppose the government sells bonds to the individual in Period 1 for good x in the amount B and makes a "transfer payment" to the individual of G units of good x. In the second period the government taxes the individual T units of good y and pays the individual $(1+i)B$ units of good y to redeem the bonds.

Consider first the case where the individual keeps in mind the future tax liability implied by bond issuance. If the government operates costlessly, G equals B and $(1+i)B$ equals T. As the bonds must compete with production of good y—that is, investment—$(1+i)$ equals $(1+r)$. The real interest rate is not influenced by the bond issue. Moreover, the individual's investment is not influenced by the transfer payment and bond issue because the bonds are held to cover the tax liability T. Saving rises in the amount of the bond issue. This is illustrated in Figure 6. (Notice that Figure 6 is essentially identical to Figure 1.)

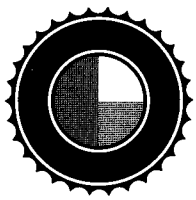
Suppose, however, that the individual ignores her tax liability T. By failing to incorporate the tax liability into her decision, she overestimates her wealth. If x and y are normal goods, she reduces her investment in Period 1 and is ultimately worse off, as is illustrated in Figure 7. Bonds are erroneously substituted for investment. As bonds still compete with production of good y, interest rates are not affected, $(1+i) = (1+r)$. However, the realized rate of substitution of future goods for current goods now exceeds the rate of interest.

Concluding comments

The preceding analysis has several implications for the shift in U.S. fiscal policy. The reduced rate of growth in transfer payments should stimulate production. Increased defense expenditures could lead to lower private production and investment. Increased government borrowing could stimulate consumption and discourage investment in the near term but eventually might lead to disappointment and lower consumption. Lastly, a reduction in investment caused by defense expenditures or by borrowing does not require a rise in interest rates.

4. The individual's utility function is separable in good z.

5. However, some forms of government expenditures—roads, for example—may affect private production technologies and thereby may encourage production.



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