

FEDERAL RESERVE BANK OF ST. LOUIS

OCTOBER 1978



REVIEW



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Taxation of Capital Gains: Principle Versus Practice

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THE taxation of capital gains has been a controversial subject ever since the income tax was instituted in 1913. Capital gains have been taxed "preferentially" at lower rates relative to ordinary income since the 1920s, but the trend in recent years has been to reduce the preference extended to capital gains. Advocates of even further increases for the capital gains tax often contend that a capital gain is no different than ordinary income, such as wage income, and so should not be taxed preferentially. Further, it is often pointed out that those with greater wealth tend to benefit most from the preferential tax treatment of capital gains.

A contrary view has recently gained support in Congress as reductions in capital gains taxes have been included in the tax cut bill recently passed by the Congress. Advocates of a reduction in capital gains taxes often note that the dollar value of some assets has risen sharply in the past decade due to rapid inflation such that the "real" burden of the tax has risen. In view of these rapid increases, some argue that the increases in capital gains taxation have gone too far. They argue that taxation of such gains stifles saving and investment, misallocates resources, and thereby restricts economic growth.

These differing viewpoints about the taxation of capital gains are due, in part, to differing conceptual ideas of what constitutes income. Also, differences arise from diverse assessments of tax considerations such as equity, economic growth, and efficiency. Those desiring to reduce the capital gains tax tend to stress economic efficiency and growth arguments while those desiring to raise such taxes tend to stress equity considerations. The present discussion is intended to give background on the taxation of capital gains and to point out some of the gaps between the way capital gains are currently taxed and the way they would be taxed if recognized principles of taxation were followed.

CAPITAL GAINS TAXATION — THE PRACTICE

Presently, capital assets are defined in U.S. tax law as all property except that held for sale in the ordinary conduct of business such as business inventories.¹ Gains (or losses) in the market value of capital assets are recognized under current tax law when they are realized, that is, when the asset is sold or transferred to a new owner, rather than when the market value of the asset actually changes. The current law also distinguishes among capital assets on the basis of the length of time the asset is held. Short-term gains, currently defined as gains on assets held less than one year, are taxed as ordinary income, whereas long-term gains, those on the sale of assets held longer than one year, are taxed at lower rates.² Under current law, long-term capital losses realized by individuals can fully offset long-term capital gains realized in the same period, but only one-half of net long-term losses can be written off against ordinary income, and then, only up to \$3,000 a year. Losses in excess of these limits can be carried over into subsequent years.

While capital gains are generally not taxed in a number of countries, including Japan and West Germany,³ these gains have been taxed in some form in the United States since the institution of income taxation in 1913. Initially, capital gains were taxed as ordinary income, but after a period of rapid inflation during and immediately following World War I, maximum tax rates were reduced on ordinary income as

¹For further details, see *U.S. Master Tax Guide*, 1977 (Chicago: Commerce Clearing House, Inc., 1976), pp. 319-25.

²For many years the distinction between short-term and long-term capital gains was six months. Under the 1976 tax legislation, nine months was the dividing point for capital assets sold in 1977 and one year thereafter.

³Richard Goode, *The Individual Income Tax* (Washington, D.C.: The Brookings Institution, 1976), p. 180.

well as on capital gains. Furthermore, at that time long-term capital gains began to be taxed at preferential rates relative to ordinary income.

From the early 1920s to the early 1940s, the maximum tax rate on long-term capital gains was changed several times, but it was always lower than rates on ordinary income. From the late 1940s to the late 1960s, tax rates on capital gains remained essentially unchanged. During this period, long-term capital gains by individuals were taxed as *either* ordinary income on one-half of the gain or at a maximum tax rate of 25 percent on the entire gain, whichever yielded the smaller tax.

In recent years, the capital gains tax rate has been raised. The Tax Reform Act of 1969 increased the maximum rate to 35 percent on net long-term gains of \$50,000 or more; the 25 percent maximum tax rate remained on the first \$50,000 of net long-term capital gains. Furthermore, a 10 percent minimum tax was levied on several so-called preferential income items of which one item was the excluded one-half of long-term capital gains.⁴ The capital gains tax was increased again in the Tax Reform Act of 1976. The minimum tax was increased to 15 percent on preference income items, and the "basis" on bequeathed property was carried over from the decedent.⁵ Under prior law, the basis of property transferred at death was increased to its current market value, which allowed the avoidance of a capital gains tax on gains during the decedent's lifetime.⁶

The yield from the capital gains taxes has been a relatively small proportion of total income taxes paid to the Federal Government. In 1973 the estimated capital gains tax yield was \$7 billion, only 4.7 percent of total income taxes collected by the Federal Government.⁷ In addition, the tax yield from capital gains income has fluctuated substantially from year to year. For example, the capital gains tax is estimated to have yielded \$8.5 billion in 1968, but only \$3.4 billion in 1970.

⁴The minimum tax pertains to eleven tax preference items. The tax is applied to the sum of these eleven items reduced by either \$10,000 or one-half of the individual's regular tax liability, whichever is greater.

⁵In many instances, basis is the cost of the asset to the taxpayer. For further details, see *U.S. Master Tax Guide*, 1977, pp. 309-19.

⁶Inheritance taxes tended to tax these gains, however, since they were included in the estate of the deceased.

⁷For estimated revenue from the capital gains tax from 1948 to 1973, see Joseph A. Pechman, *Federal Tax Policy*, Appendix Table C-13 (Washington, D. C.: The Brookings Institution, 1977), pp. 352-53.

GENERATION OF CAPITAL GAINS

Capital gains and losses are changes in the market value of capital assets. In order to understand the nature and source of these gains (or losses), this section outlines the basic principles for the valuation of an asset.

In principle, assets are valued for the earnings or services they are expected to provide; that is, the current value of an asset is the value of the expected current and future stream of earnings or imputed services from the asset. However, since a dollar's worth of goods today is worth more than a claim to the same amount of goods in the future, expected income streams cannot simply be added up. Rather they are typically adjusted by some factor which reflects this difference between a dollar received today and a dollar received in the future. This difference is reflected in the rate of interest which can be thought as the inducement to forego current consumption. For example, the capitalization formula for determining the present value of a constant stream of returns (R) over an infinite time span when discounted by some rate of interest (i) is given by the simple formula $P = \frac{R}{i}$.⁸ If an asset is expected to yield \$100 a year in perpetuity and is discounted at a 10 percent rate of interest, the present value of the asset is \$1,000, that is $(\frac{\$100}{.10})$.

While this formula ignores the complexities of most assets, it is sufficiently general to serve as a tool for classifying the sources of changes in the value of capital assets; namely, those reflecting a change in the expected earnings of the asset and those reflecting a change in the rate at which the earnings stream is capitalized.

An asset changes in value when its expected earnings changes. If the expected income stream increases from \$100 to \$150 and is discounted at a 10 percent rate, the value of the asset would be immediately bid

⁸The present value (P) of a constant stream of earnings can be written as $P = \frac{R_0}{1+i} + \frac{R_0}{(1+i)^2} + \dots + \frac{R_0}{(1+i)^N}$,

where R_0 is net income, i is the rate of interest and N is the number of periods over which the earnings are expected. This formula can be written in shortened form as simply

$P = \sum_{N=1}^{\infty} \frac{R_0}{(1+i)^N}$. When N becomes very large, the formula reduces to $P = \frac{R_0}{i}$.

up from \$1,000 to \$1,500 or $(\frac{\$150}{.10})$. For purposes of the current discussion, changes in expected earnings are classified into those resulting from anticipated changes in relative prices, those resulting from anticipated changes in the general price level, and those resulting from additional investment in the asset.

Changes in relative prices can reflect a whole host of real supply and demand factors, such as changes in technology, population growth, and changes in tastes and preferences of consumers. When changes in supply or demand factors occur such that the expected future earnings of the asset are affected, the value of the asset will immediately be bid up or down.

A second important source of increases in nominal earnings is an increase in the general price level. As the price level is expected to rise, the earnings stream from some assets can also be expected to increase. While the nominal price of these assets will in turn rise over time, the increase in the price, if it reflects the inflation only, does not affect the owner's ability to consume goods and services now or in the future.

A third source of increase in capital value is through additional investment in a capital asset. While the expected income flow from the asset is presumably increased, the asset itself has been changed or added to. Thus, appreciation in asset values reflecting additional investment should be distinguished conceptually from unforeseen revaluations of an income stream from an unaltered asset. However, in practice, observing changes in market values of an asset would not reveal whether the change reflected additional investment or an unforeseen revaluation of the income stream.

The value of a given income stream can also change due to interest rate movements. Changes in interest rates may, in turn, reflect revisions in expectations of inflation, changes in the productivity of capital, changes in the evaluation of present and future consumption, or investor attitudes toward risk. If, for example, a perpetual bond pays \$50 per year, the value of the bond at a 10 percent rate of interest would be \$500 or $(\frac{\$50}{.10})$. If the rate of interest should fall to 8 percent because of an anticipated decline in inflation, the value of the bond would increase to \$625 or $(\frac{50}{.08})$.

To summarize, in a world where events are perfectly anticipated, real capital gains of the so-called

"pure" type would not occur.⁹ While conditions could be changing, these changes would be incorporated into expectations so that no alternation in the earnings stream or discount rate would be a surprise. In actuality, events are not perfectly anticipated so that adjustments in asset values are constantly occurring. Many of these changes, however, involve losses to some and gains to others. Take the earlier example of the perpetual bond. The owner of the bond gained when interest rates declined; however, the issuer of the bond loses to a like extent since the "real" value of the coupon has increased.

A PRINCIPLE FOR TAXATION OF CAPITAL GAINS

Whether capital gains should be taxed in principle depends on the measure of income chosen. For taxation purposes, two primary definitions have been offered. One view of income, as promoted by Irving Fisher and others, defines income simply as services actually consumed from wealth; whereas, services received from wealth but not consumed (saving) are not regarded as income.¹⁰ Essentially, Fisher defined income as what is normally regarded as consumption. A second view of income promoted by Henry Simons, among others, defined income as "the algebraic sum of (1) the market value of rights exercised in consumption and (2) the change in the value of the store of property rights between the beginning and end of the period in question."¹¹ This definition is generally referred to as the accretion principle which means simply that income equals the increase in the individual's net worth plus consumption during the period.

These two measures of income would appear to imply substantially different taxes, yet they are not as dissimilar as they at first may seem. The primary difference between the two views of income is one of timing in recognition of purchasing power. Fisher's definition recognizes income when it is spent, whereas the accretion principle recognizes income when it is

⁹Pure capital gains are often defined as unexpected rises in the value of an asset as distinguished from expected increases in the market value of an asset resulting, for example, from increased investment in an asset. For a discussion, see Lawrence H. Seltzer, *The Nature and Tax Treatment of Capital Gains and Losses* (New York: National Bureau of Economic Research, 1951), pp. 53-54.

¹⁰Irving Fisher, *The Nature of Capital and Income*, original edition in 1906, reprinted as a series title in *Reprints of Economic Classics* (New York: August M. Kelley, 1965).

¹¹Henry C. Simons, *Personal Income Taxation: The Definition of Income as a Problem of Fiscal Policy* (Chicago: University of Chicago Press, 1938), p. 50.

earned. If savings are eventually spent over a person's lifetime (including bequests), the present value of the tax liabilities would be equivalent under the two definitions.¹²

While these views of income are similar, the accretion view emphasizes that receipts which are saved confer the same benefits, in terms of purchasing power or ability to pay, as receipts which are used to consume goods and services. Given currently prevailing social values, the accretion principle has become the dominant measure of income for tax purposes.

DISCREPANCIES BETWEEN PRINCIPLE AND PRACTICE

While the accretion principle provides the standard measure of income for taxation purposes in this country, a large gap exists between the way income, and in particular capital gains, are taxed in practice and the way they would be taxed according to this principle. These deviations are sometimes due to different conceptual interpretations of the accretion principle, and sometimes they reflect administrative problems.

Double Taxation

While in principle an income stream should be taxed only once, taxation of capital gains on market income-bearing assets raises conceptual problems of whether double taxation occurs when both the current earnings and the change in wealth associated with the income stream are taxed. Using again the simple valuation formula $P = R/i$, suppose a tax of t percent is applied to the stream of returns, R . The valuation formula then becomes $P = \frac{R(1-t)}{i}$, that is, the value of the asset is reduced by t percent with the imposition of a tax on the earnings from the asset. If, for example, a 50 percent proportional tax is levied on a \$100 stream of income, the value of the asset is low-

ered from \$1,000 or $(\frac{\$100}{.10})$ to only \$500 or $[\frac{\$100(1-.5)}{.10}]$. The tax on income is reflected in an implicit tax on the value of the asset.

If the income stream is expected to rise to \$150 due to a favorable change in the market valuation of the services of the asset (or the real interest rate declines to 6.67 percent), the after-tax value of the asset will be bid up to only \$750. In the absence of the income tax, the value of the income stream or the asset value would have risen \$500 (from \$1,000 to \$1,500), due to the expected \$50 increase in income. However, since the income tax reduces this gain in income to \$250, the asset rises in value by only \$250. Thus, an implicit tax of \$250 on capital gains is paid by means of the ordinary income tax on the extra income. Thus, if an additional tax is imposed on the capital gain associated with a rise in expected future earnings, the income from the asset is being taxed twice, once on the increased stream of income as it occurs and once on the anticipation of the increased stream of income.

The above analysis implies that the capital gains tax should be completely removed from those assets which generate income streams that are fully taxed by the income tax on ordinary income. In principle, a capital gains tax would remain on the appreciation of an asset, where that appreciation in value is due to a nontaxed increase in the income derived from it. The most notable example is owner-occupied housing which yields an imputed income equal to that achievable if the house were rented. A capital gains tax would not capture the entire income stream from such an asset, but at least would capture the increases in the income stream.

Corporate Income and Triple Taxation — Under current tax laws, dividends paid by corporations to stockholders are subject to three taxes — first, the corporate income tax, second, the ordinary income tax on dividends, and third, the capital gains tax. To illustrate this point, suppose a corporation, which pays out all of its earnings in dividends to its shareholders, has an unexpected increase in its earnings per share from \$10 to \$20 per year. In the absence of a tax on this income, the value of a share of stock would have appreciated \$100 or $(\frac{\$20}{.10} - \frac{\$10}{.10})$. If, however, there is a 50 percent tax on corporate income and another 25 percent tax, at the margin, on dividend income, the after-tax value of the stock will in-

¹²The present values of the tax liabilities under the two tax schemes are equal if the yield on savings is the same as the discount rate on future income. Under a consumption tax of t percent and a propensity to consume of c percent, the present value (P) of the tax on a receipt (R) is given by the formula: $P = tcR + \frac{t(1-c)R(1+g)^N}{(1+i)^N}$, where g is the rate of interest obtained on savings, i is the rate at which future income is discounted, and N is the period in which the savings is consumed. If g equals i , the second term becomes $t(1-c)R$, so that the present value of the tax is $tcR + t(1-c)R$ or simply tR . Under an income tax of t percent, a receipt is taxed only in the period received so the present value of the tax is simply tR . Thus, the present value of the tax liabilities are equivalent under such circumstances.

crease only \$37.50 or $\left[\frac{\$20(.5)(.75)}{.10} - \frac{\$10(.5)(.75)}{.10} \right]$.

As a result of these two taxes, the before-tax increase in the expected income stream is implicitly taxed \$62.50; \$50 by the tax on corporate income, and \$12.50 by the individual tax on dividends. If, in addition, a capital gains tax is imposed on the \$37.50 gain realized by the sale of a share of stock, the same increase in corporate earnings would be taxed a third time.

Some analysts advocate the taxation of capital gains since corporations can choose to retain their earnings and reinvest them in order to increase future income (and create a capital gain by increasing the real capital claim represented by a given share of stock). Retention of corporate earnings allows the taxpayer to defer taxes into the future, thus giving preferential treatment to these earnings relative to dividends paid to stockholders.

The taxation of capital gains, however, is a second best solution. Since the problem arises because earned corporate income can be diverted from realized income (dividends) to retained earnings, the solution is to remove the possibility of avoiding income taxation through retained earnings. The generally recognized means of accomplishing this is to eliminate the corporate income tax and fully apportion all the earnings of the corporation among the stockholders. Under this solution corporation earnings (whether retained or not) would be taxed only once on the individual stockholder's income tax return.¹³ Since corporate income would be fully taxed as ordinary income, no additional tax would need to be imposed on increases in the value of corporate stock.

Administrative Problems — Conceptually, in order to avoid double taxation, a capital gains tax should be applied only to those assets whose income streams are not fully subject to ordinary income taxation. Yet, the application of this principle for capital gains taxation presents major administrative problems. The difficulty arises because only the market value of an asset can be observed; thus, separating that portion of the asset appreciation which represents income which has escaped ordinary taxation is very difficult. This type of problem even arises in cases where the income stream from the asset is not taxed at all, such as owner-occupied housing, because

observed market values also incorporate purely inflation gains.

Inflationary Gains

The most questionable aspect of current capital gains taxation regards those gains in asset values which simply reflect the general rise in prices. Since these gains do not represent real increases in the command over goods and services, such gains should not be included in the income tax base.¹⁴

The rapid inflation of the past ten years has brought about large increases in asset values, as the consumer price index has risen about 80 percent. Thus, an asset which cost \$100,000 ten years ago would have had to appreciate approximately \$80,000 in order to have maintained its consumer purchasing power of ten years ago.

While there is widespread agreement that gains in nominal value as a result of inflation should not be taxed, there are practical, as well as conceptual, difficulties in separating real gains from the price increase caused by inflation. One method of adjustment could be to change the basis (or cost) of the asset by an appropriate factor based upon some price index. For depreciable assets, a method of cost accounting based upon the replacement cost rather than the historical cost of an asset would help alleviate the inflation bias.

Bunching of Gains

In principle, capital gains would be taxed as they accrue. Largely for the administrative reason that assets would need to be revalued each year, capital gains are presently taxed only when realized, that is, when the asset is sold. Thus, unrealized gains can accrue over a number of years. Taxing such gains when they are realized as ordinary income can result in a greater tax liability because of the progressive income tax structure than if the gain had been taxed as it accrued over time.¹⁵

This problem, however, could be alleviated by taxing capital gains as they accrue or by using an income averaging technique.¹⁶ There is general agree-

¹³Proposals to eliminate multiple taxation of corporate income through integration of the corporate and individual income taxes have been often proposed. For example, see George F. Break and Joseph A. Pechman, *Federal Tax Reform: The Impossible Dream?* (Washington, D.C.: The Brookings Institution, 1975), pp. 90-104.

¹⁴The effects of inflation on income taxation are not unique to the capital gains taxes. For other examples, see John A. Tatom and James E. Turley, "Inflation and Taxes: Disincentives for Capital Formation," this *Review* (January 1978), pp. 2-8, and Nancy Jianakoplos, "Paying More Taxes and Affording It Less," this *Review* (July 1975), pp. 9-13.

¹⁵Tending to offset this loss is the gain associated with the deferral of capital gains taxes until the proceeds from the sale of an asset are realized.

¹⁶Obviously a reduction in the progressivity of the income tax structure or a simple proportional income tax would also eliminate these problems.

ment that practical considerations involved in revaluing capital assets each year precludes the taxing of gains as they occur. If capital gains are to be taxed at ordinary rates, however, there is considerable merit in using averaging techniques to overcome the bunching problem.

Economic Efficiency and Growth Considerations

Arguments are frequently made that taxation of capital gains discriminates against saving, so that a decrease in the rate of taxation of capital gains would stimulate saving, investment, and economic growth. In principle, the argument that the taxation of capital gains reduces saving is really a part of a more general argument that an income tax tends to discourage saving relative to consumption.¹⁷ In practice, however, several features of the current treatment of capital gains further discriminates against saving and in some cases creates inefficiencies.

The current asymmetrical treatment of capital losses reduces the incentive to save and tends to inhibit risk-taking ventures. As indicated earlier, under current law long-term capital losses can be offset against long-term capital gains in full, but only one-half of net long-term capital losses, up to a maximum of \$3,000, can be written off in any one year against ordinary income. Such treatment of capital gains and losses increases Government revenue from what it would be if losses and gains were treated equally. Therefore, savings are reduced from what they otherwise would be. Furthermore, because the risks of losses are borne more fully by the businessmen, launching new ventures, which by their nature are quite risky, is inhibited by the unequal treatment of gains and losses.

The fact that capital gains are taxed when realized rather than when they accrue results in economic inefficiency due to the resulting "lock-in" effect. This effect occurs because as gains accrue and a potential tax liability accumulates, investors become reluctant to shift assets in their portfolios. When making

the decision to shift between assets where substantial capital gains have been accumulated, high enough yields must be anticipated to compensate for the capital taxed away. The additional rate of return which the new assets must be expected to yield increases with the size of the gain on the old asset and the investor's marginal tax bracket.

This lock-in effect influences economic efficiency in several ways. The productivity of an asset may diminish when it is dependent on the owner and that owner no longer employs the asset in its most efficient use. The lock-in effect may also reduce the well being of households by forcing them to hold assets they would otherwise rather not hold. For example, an owner of risky stocks during high income years may find that during his retirement years he would prefer less risky dividend-paying stocks. Large capital gains taxes would tend to preclude the owner from changing his portfolio in the desired way.

CURRENT CAPITAL GAINS TAX PROPOSALS

Several proposals have been offered in the present Congress to reduce the tax on capital gains. Last August the House of Representatives passed a tax cut bill which included the lowering of the maximum rate on capital gains from 49 to 35 percent by removing the minimum tax on the excluded portion of capital gains income, but a new 10 percent alternative minimum tax was imposed if this tax exceeded an individual taxpayer's regular tax liability. Two additional features of the House-passed tax cut bill which affected capital gains were a provision for indexing of capital gains for inflation starting in 1980 and a provision that gave homeowners a once-in-a-lifetime opportunity to realize up to \$100,000 in gains from the sale of their home tax-free without regard to whether another home was purchased. The tax cut bill recently passed by the Senate raised the exclusion for long-term capital gains from 50 to 70 percent and lowered capital gains taxes on homes by excluding gains on homes priced under \$100,000 when sold by individuals 55 years of age or older.

The tax bill sent to the President for his signature represents a compromise, worked out in a conference committee, between these two bills. In the final bill the exclusion of long-term capital gains from regular income taxation for individuals is increased from the current 50 percent to 60 percent. A new alternative minimum tax is included in the final bill which would be paid on the excluded portion of capital

¹⁷In principle, this argument is true of an income tax which includes both saving and consumption. An income tax based on a proper implementation of the accretion principle is not neutral with respect to current and future consumption. A proportional tax on both labor income and capital income tends to discourage saving relative to consumption. In addition, if the tax structure is progressive rather than proportional and individuals tend to save a higher proportion of their income as their incomes rise, saving will be even further reduced relative to consumption. For details of these arguments, see Richard A. Musgrave, *The Theory of Public Finance* (New York: McGraw-Hill Book Company, Inc., 1959).

gains only if it exceeds regular taxes plus the existing minimum tax which is now altered to include a list of only eight preference items. The maximum marginal bracket for the new alternative minimum tax is 25 percent for amounts exceeding \$80,000. In addition, the bill provides that homeowners, 55 years and older, can exclude a gain of up to \$100,000 on a sale of their home.

The provisions of the current tax bill sent to the President do little in the way of fundamental reform under the accretion principle. Lowering the capital gains tax rate, however, is in the right direction for assets which bear explicit market incomes. Such a reduction also will help increase saving and make investment more attractive. Yet substantial double taxation of some types of assets will remain along with a number of adverse features of the present tax law concerning capital gains.

Ironically, the proposed capital gains tax relief on owner-occupied homes has been retained in the final tax bill sent to the President, despite the fact that taxation of these gains (to the extent they are real gains) is the most justifiable on economic grounds of all capital gains taxes. In the current income tax base, the imputed rental value of owner-occupied dwellings are not included, although in principle it is income. Thus, as noted earlier, the taxing of the capital gains on such housing is one way to capture part of this implicit income. If the tax cut bill is signed by the President and becomes law, these implicit rents will not be taxed until they rise by a very large amount. Since owner-occupied housing will be treated differently than other assets, there will be an even stronger incentive to invest in homes rather than in other assets. Thus, investors will be encouraged to hold more of the nation's capital in the form of housing relative to other investment goods.

CONCLUSION

The controversy over the appropriate taxation of capital gains income has been rekindled and the recent Congressional tax cut bill calls for the reduction of taxes on such gains. With rapid inflation increasing real tax burdens on capital gains and with growing national concern about lagging investment and productivity growth, it becomes understandable why proposals to reduce capital gains taxation have gained so much support in Congress.

The taxation of capital gains, as practiced in the United States, is quite different from that implied by the accretion principle. Equity considerations alone would result in capital gains income being taxed only on assets where the income streams are not subject to ordinary income taxation. Thus, capital gains should be removed for assets which yield market income. As demonstrated earlier, the market value of such assets are after-tax values, so that a tax has already been imposed on assets which yield market incomes. Furthermore, on those assets where the capital gains tax remains, the accretion principle implies that only real gains should be taxed and that losses should be treated equally with gains.

The discrepancy between the practice of capital gains taxation in this country and the accretion principle for taxing such gains also adversely affects economic growth and efficiency. Double taxation of some assets, taxation of inflationary gains, and treating losses differently than gains tend to reduce saving, investment, and thus economic growth. Tailoring the capital gains tax after the accretion principle would not only improve the equity of the tax system, but at the same time would encourage economic growth and efficiency.



Budget Deficits and Trade Deficits: Is There a Link?

JAI-HOON YANG

HISTORICALLY, Federal budget deficits have decreased steadily as recovery from recession has progressed, and the budget has approached a balance in the later phase of recovery. In late 1978, however, well into the fourth year of recovery from the most recent recession, the Federal deficit is reported at \$65 billion and shows signs of remaining large for the next several years.

Strong misgivings about the economic impact of current and prospective Federal deficits were expressed by Arthur Burns in a recent panel discussion:

... instead of diminishing or vanishing, as used to be American practice during business cycle expansions — I see the budget deficit mounting. . . . I see a budget deficit this year, including off-budget outlays as we should, of \$65 billion. I see a deficit as large as or larger than that next year. I ask myself the question: do we have responsible financial management by our government at the present time?¹

Walter Heller, appearing on the same panel, responded to Burns' expression of concern with the observation that:

... as long as state and local governments run a \$30 billion surplus and foreign governments run a near \$25 billion trade surplus against us, the federal deficit mainly serves to offset those surpluses.²

This response is typical of the frequently expressed view that the currently sizable Federal deficits are necessary to offset the surpluses generated in other sectors of the economy and trade deficits.³

¹"Tax Revolt: A Cure or a Curse?" *Washington Post*, July 30, 1978. Arthur Burns is a former chairman of both the Council of Economic Advisors (CEA) and the Board of Governors of the Federal Reserve System.

²Ibid. Walter Heller also is a former CEA chairman.

³This view, for example, is shared by the CEA. See *Economic Report of the President*, 1978, pp. 88-91. Also see Charles L. Schultze, "Prepared Statement," U.S. Congress, Joint Economic Committee, *The 1978 Economic Report of the President*, 95th Cong., 2nd sess., January 31, 1978, pp. 22-23. Implicit in such a view may be the notion that it is not so much the age or stage of the economic expansion, but the size of the output gap — the distance between the actual and potential output — which should govern the thrust of fiscal policy. Pre-

The Federal budget position is related to the balance of accounts in the other sectors of the economy through the accounting procedures used to measure national economic activity. In this national income accounting framework, a surplus in the budgets of state and local governments, a balance between private domestic saving and investment, and a sizable trade deficit require that the Federal budget be in deficit. However, the national income accounting identity does not, by itself, help explain the coupling of the persistently large Federal budget deficits with the sizable trade deficits that have been in the news lately. Specifically, the accounting relationship sheds no light on the underlying economic behavior in the private and public sectors which has resulted in such deficits. The economic significance of simultaneously large deficits in the Federal budget and in our trade with foreign countries requires analysis of the factors which contribute to the current situation. Such an analysis reveals that the large trade deficit is symptomatic of the inflationary pressures which prevail in the economy, and to the extent that the large Federal budget deficits contribute to such inflationary pressures, the two deficits are causally linked.

National Income Accounting Identity

National income is generated in the process of producing goods and services in the economy and can be thought of simply as the *maximum* amount which the citizens of a nation can consume during a particular accounting period while maintaining the total wealth of the economy intact.⁴ To the extent

sumably, the larger the gap, the more stimulative the policy should be. Such a gap approach to policy formulation suffers, however, from the absence of reliable measures of the output gap. For references, see fn. 21 below. More fundamentally, such an approach tends to divert attention from the more fundamental task of identifying the underlying factors responsible for the emergence and persistence of the gap.

⁴National income accounting has evolved over the years to measure national income and such related economic activities as saving and capital formation (investment). For a thorough discussion of the national income accounting system and other economic accounts, see John W. Kendrick, *Economic Accounts*

that aggregate consumption falls short of national income, *saving* will be generated and national wealth will be larger at the end of the period than at the beginning. Since national income is measured by the value of goods and services produced, an excess of national income over consumption implies a larger stock of goods on hand at the end of the period. National income accountants refer to this increase in the stock of goods as aggregate domestic *investment*.

In a closed economy — one which does not engage in international transactions — aggregate domestic investment cannot be larger than aggregate domestic saving out of national income. Saving is possible only by cutting back on current consumption. Domestic saving, in turn, can be decomposed into private and government components, with government saving being comprised of budgetary surpluses of Federal and state and local (S&L) governments. However, in an open economy — one with transactions beyond its borders — aggregate domestic investment can be larger than aggregate domestic saving to the extent that foreign saving is made available domestically. That is, in an open economy, resources used for domestic investment can come from both domestic and foreign savings. This can be expressed schematically as:

<u>Saving</u>		<u>Investment</u>
Private		Private Domestic
Fed Gov't Surplus		Investment
S&L Gov't Surplus		
Foreign		
<hr/>		<hr/>
Total Saving	=	Total Investment ⁵

These terms can be rearranged to yield the following accounting identity which holds at all times:

(1) Fed budget deficit = net private saving + S&L gov't saving + foreign saving (made available in U.S.).

Here, net private saving is the excess of *private* domestic saving over *private* domestic investment. Hence, the size of the Federal budget deficit must necessarily equal the sum of savings made available by the state and local governments, foreigners, and net private saving. That is, if the Federal Govern-

ment is to borrow resources to cover its deficits, these resources must be supplied by some combination of net private saving out of current income, budget surpluses in other levels of government, or foreigners' saving out of their current income.

Foreign saving which is made available for domestic uses, however, is the counterpart of the balance on our trade of goods and services with other countries. An excess of imports over exports is called a trade deficit and represents the net saving by foreigners which is made available for domestic uses.⁶

Hence, expression (1) may be rewritten as:

(2) Fed budget deficit = net private saving + S&L gov't saving + trade deficit.

Thus, the statement that the Federal budget deficit serves to offset the sum of state and local government saving and the trade deficit is a correct *accounting* statement only if net private saving is zero or remains unchanged. Data in Table I indicate, however, that net private saving has seldom equalled zero or stayed unchanged.

Expression (2) indicates that there is no necessity for any given change in the trade deficit to be offset by or to induce a comparable, or even any, change in the Federal budget deficit.⁷ With a given trade deficit, offsetting changes in net private saving and/or state and local government surpluses can maintain the accounting identity without any necessary change in the Federal budget deficit. An accounting identity, such as expression (2), provides no useful clue, by itself, for identifying the set of factors which contributed to the recent emergence of deficits in both the trade account and the Federal budget. If such an identity is to be useful for analyzing and designing policy actions affecting both the trade account and the Federal budget, it must be supplemented by analysis of the determinants of the Federal budget deficit and the trade deficit, and the possible link between the two deficits.

The first step in unravelling the possible link between the Federal budget deficit and the trade

and *Their Uses* (New York: McGraw-Hill Book Company, 1972). For expositional convenience, no distinction is made in this paper between various concepts of national income aggregates such as gross national product, net national product, and national income.

⁵By convention, government sectors in the U.S. are assumed not to engage in any investment activity.

⁶For expositional convenience, net unilateral transfers have been ignored here.

⁷The CEA appears to endorse the view that the trade deficit is somehow determined independently of the factors impinging on other accounts in the identity and that the other accounts, notably the Federal budget, must adjust to preserve the accounting relationship. See *Economic Report of the President*, 1978.

Table 1

Selected Balances in the National Income and Product Accounts¹
(in millions of dollars)

	(1) Balance on Federal Budget: Deficit (+) or Surplus (-) ²	(2) Net Private Saving ³	(3) Balance on S&L Gov't Budget: Deficit (-) or Surplus (+)	(4) Trade Balance: Deficit (+) or Surplus (-) ⁴	(5) Statistical Discrepancy ⁵
1962-72	\$ 6,395	\$ 3,138	\$ 2,184	\$ -301	\$1,374
1973	6,711	-9,497	13,003	576	2,629
1974	10,721	-5,070	7,564	2,464 ⁵	5,763
1975	70,584	68,889	6,206	-11,882	7,371
1976	53,807	27,708	20,654	1,235	4,210
1977	48,148	-7,042	29,558	20,891	4,741

¹Based on the national income accounting identity stated in the text, except for the statistical discrepancy: (1)=(2)+(3)+(4)+(5).

²Does not include off-budget items.

³Gross private saving less gross private domestic investment.

⁴Corresponds to net foreign investment in the national income and product accounts, with the signs reversed. Reinvested earnings on foreign investment have not yet been incorporated in this measure of the trade balance.

⁵Excludes \$2,010 million paid to India under the Agricultural Trade Development and Assistance Act, that is, \$4,474 - \$2,010.

⁶Includes SDR allocations in the 1970-72 period.

Source: Department of Commerce.

deficit requires an understanding of what a trade balance is and what its proximate determinants are.

What Is the Trade Balance?

The trade balance is simply the difference between the value of exports and imports. Alternatively, the trade balance is the difference between the value of national income (or output) and the value of spending on consumption and investment by domestic households, businesses, and government units. In a closed economy, foreign trade is zero, so aggregate domestic spending must be equal to national income (output).⁸ In an open economy, however, aggregate domestic spending can exceed national output and the result is a trade deficit. The trade deficit represents consumption and investment opportunities in excess of

the country's currently produced supply of goods and services.⁹

A trade deficit results, then, *whenever aggregate domestic spending in the United States exceeds national income*. The excess of spending over current income, or equivalently the excess of our aggregate investment over our domestic savings from private and public sectors is made possible by the "abstinence" of foreigners. Foreigners make a portion of their current output available for our current domestic use. In return, they receive assets which represent claims on our *future* output. Therefore, a U.S. trade deficit is determined by those factors that induce (1) an excess of aggregate domestic spending over national income in the United States and (2) a shortfall in aggregate domestic spending over national income in foreign countries.

⁸In national income accounting, the value of national income or aggregate supply (denoted by Y) is equated to the value of aggregate demand, composed of consumer expenditures (C), business expenditures on capital goods (I), purchases of goods and services by various levels of government (G) and the excess of exports over imports (X-F). This accounting identity can be expressed as:

$$\begin{array}{lcl} \text{Aggregate Supply} & & \text{Aggregate Demand} \\ Y & = & C + I + G + (X - F) \end{array}$$

Here, X-F is the balance of trade. Aggregate domestic spending refers to the sum C+I+G and has also been called "absorption" in the trade literature. See Sidney S. Alexander, "Effects of a Devaluation on a Trade Balance," *IMF Staff Papers*, Vol. 2 (April 1952), pp. 263-78. An important corollary of this accounting identity is, as mentioned earlier, the necessary equality between aggregate domestic investment and aggregate domestic saving by both private and public units in a closed economy.

⁹Therefore, whereas aggregate domestic investment in a closed economy must necessarily be the difference between the national output and consumption, in an open economy, it is the difference between the national output *augmented by the trade deficit* and consumption. When a nation runs a trade deficit, that is, when its imports exceed its exports, it is often said to be living beyond its means. This is not strictly correct, however. A trade deficit indicates only that a nation is *spending* beyond its current means derived from national income. Whether a nation is also *living* beyond its means depends on how the nation's spending is constituted. An analogy is a business unit which is spending more than its current income but is not considered to be living beyond its means if that spending is used to enlarge its holdings of productive assets. Similarly, should a nation incur a trade deficit to enlarge its productive capacity, it is not living beyond its means. But should the trade deficit result from the nation's economic units consuming more than its national income, it is indeed living beyond its means.

MOS: An Explanation of the Money-Trade Deficit Link

An understanding of the recently publicized coupling of the large Federal deficit with the sizable trade deficit can be achieved based on an economic theory known as macroeconomics of open systems (MOS). This theory emphasizes the interdependence of various markets for goods, services, and assets, both at home and across countries.¹⁰ MOS holds that one way a trade deficit can emerge in a particular country is as a response to excessive growth in that nation's stock of money relative to the demand for it.¹¹

In response to the emergence of an excess supply of money, the spending units in the United States would attempt to restore equilibrium in their money holdings by exchanging their "surplus" money for goods, services, and assets, both of domestic and foreign origins. This attempt to "dishoard" money increases spending across a broad spectrum of goods and assets and results in the attempt to spend more than the value of goods and services produced domestically. Whether such an attempt will succeed depends crucially on what is happening in the foreign economy and the market for foreign exchange.¹²

If the price of foreign exchange is not allowed to change (exchange rates are fixed) and, if the foreign economy were initially in a position where its demand for goods, services, and assets was equally matched by the supply of these available internally at the prevailing prices, the excess demand in the United States would succeed in inducing an increase in imports into the United States. Aggregate domestic spending in the United States would be larger than the value of currently produced output, that is, a trade deficit would result.

In the perspective of MOS, such a money-induced trade deficit under a fixed exchange rate regime is a transient phenomenon primarily because the initial excess supply of money in one country would be eliminated through trade-induced changes in money holdings. In particular, the country running a trade

deficit will experience a reduction in its money supply whereas the surplus country's money holdings will increase.¹³ That is, the trade balance is the mechanism through which an initial excess supply of money in one country gets redistributed across countries, thereby inducing adjustments in aggregate spending relative to the value of domestic production.

Should the countries be operating under a purely flexible exchange rate regime, however, the initial emergence of an excess supply of money in one country does not necessarily lead to that country running a trade deficit. This would be the case if an initial increase in aggregate domestic spending spills over into the market for foreign exchange and induces an immediate upward adjustment in the exchange rate, making the foreign currency, and thereby foreign goods, more dear.

The initial excess supply of money in a country under a managed float system, such as the one that has been in operation since early 1973, would induce an excess of imports over exports if monetary authorities intervened to resist the downward pressure on the country's exchange rate.¹⁴ Such a trade deficit would persist as long as the excess supply of money is not eliminated by the trade-induced redistribution of money holdings across countries, and by adjustment in the price levels in the trading countries.

Not all trade deficits reflect an excess supply of money, necessarily implying pressure on the exchange rate or requiring an adjustment in the exchange rate.¹⁵ There would be no pressure on the

¹⁰See, for example, Jacob A. Frenkel and Harry G. Johnson, eds., *The Monetary Approach to the Balance of Payments* (London: George Allen & Unwin Ltd., 1976).

¹¹Should there be a link between the Federal budget deficit and monetary expansion, the trade deficit might be linked causally to the monetary expansion induced by the Federal budget deficit.

¹²It is not the absolute amount of excess aggregate demand in one country that is crucial, but such an excess relative to the excess demand in other countries. To simplify exposition, a two-country world (the United States and a foreign country) is assumed here.

¹³These changes in the stocks of money held in the deficit and surplus countries would bring about an adjustment in the rates of aggregate domestic spending relative to the values of national output in the deficit and surplus countries, thereby tending to restore balances in the trade accounts and in quantities of money supplied relative to demand. For an analysis of the monetary consequences of the trade surplus, and deficit, see Richard E. Caves and Ronald W. Jones, *World Trade and Payments* (Boston: Little, Brown and Company, 1973).

¹⁴It is immaterial whether it is the deficit country's monetary authority or that of the surplus country which engages in intervention. See Anatol B. Balbach, "The Mechanics of Intervention in Exchange Markets," this *Review* (February 1978), pp. 2-7.

¹⁵This is because the exchange rate is influenced not only by what is happening to the balance in the trade account (reflecting flows of *currently* produced goods and services), but also by what is happening to the balance in the capital account (reflecting the flow of claims against *future* goods and services) and to the balance in the money account. In general, the following relationship must hold for the balance of payments:

$$\text{Balance on money account} = \text{balance on capital account} + \text{balance on trade account.}$$

Therefore, should a deficit on trade account be just offset

exchange rate, however, if the emerging deficit in the trade account is exactly matched by a surplus in the capital account. That is, should the demand for foreign currencies¹⁶ be exactly matched by the supply of foreign currencies at the prevailing exchange rate, the exchange rate would not change even were there to be an excess of imports over exports. This is because a net inflow of goods and services is exactly matched by a net inflow of funds from foreigners who are willing to make investments in the deficit country. In this case, the net purchase of goods and services from foreigners is financed by the net sale of investment assets to foreigners.¹⁷ The exchange rate would not change even though there is a trade deficit.

The willingness of *private* foreigners to save and make that saving available in the United States holds a key to whether there is an equilibrium in our international transactions. Such an equilibrium is characterized by an absence of pressures to bring about changes in the pattern of trade and capital flows or in the exchange rate. Since the overall balance of payments must be zero,¹⁸ when one speaks of the balance in the trade and capital accounts as a necessary condition for an equilibrium in international transactions, one refers to the balance of transactions designed to finance consumption and investment decisions, rather than official transactions conducted by the monetary authorities to maintain a target exchange rate.¹⁹

by a surplus on capital account, there would be no change in the money holdings and no pressure on the exchange rate. From this perspective, a change in the exchange rate is indeed a monetary phenomenon. It should be noted that, under a flexible exchange rate regime, foreign trade induced changes in the money stock in both deficit and surplus countries could occur only if there are adjustment lags in the process determining the exchange rate.

¹⁶Such a demand helps to alter both the composition and the level of consumption and investment expenditures from what is available solely from domestic production.

¹⁷Such a voluntary (or autonomous) inflow of capital is possible if, for example, an improvement occurs in the expected rate of return on investment in the home country. This (relative) change in the expected returns on investment would call for a redistribution of investment expenditures across countries. If there are no restrictions on the flows of both capital and goods across borders, the home country's investment would be augmented to the extent of the trade deficit it runs, with the trade deficit being just offset by the voluntary supply of savings made available to the home country by foreigners. The trade deficit is a mechanism by which a country obtains command over current resources in exchange for a promise to pay out of the augmented flow of output in the future.

¹⁸This is due to the system of double-entry bookkeeping. See Donald S. Kemp, "Balance-of-Payments Concepts—What Do They Really Mean?" this *Review* (July 1975), pp. 14-23.

¹⁹Official transactions are more likely to be conducted to maintain a target exchange rate. Under an adjustable peg sys-

Table II

Selected Balances in the Balance
of Payments Accounts¹
(in millions of dollars)

	(1) Trade Balance: Surplus (+) or Deficit (-) ²	(2) Net Private Capital Outflow (-) or Inflow (+)	(3) Net Official Capital Outflow (-) or Inflow (+) ³	(4) Statistical Discrepancy ⁴
1962-72	\$ 1,971	\$-4,172	\$ 3,405	\$-1,204
1973	6,885	-8,024	3,864	-2,725
1974	1,719	-9,947	9,913	-1,685
1975	18,445	-26,725	2,830	5,450
1976	4,339	-24,968	11,330	9,299
1977	-15,221	-16,994	33,214	-999

¹From balance of payments accounts: (1)+(2)+(3)+(4)=(0).

²Corresponds to balance on current account in the balance of payments accounts. Data reflect the recent change in definition to include reinvested earnings on foreign investment. The major difference between this measure of the trade balance and the national income and product accounts measure given in Table I is the incorporation of the reinvested earnings on foreign investment.

³Net increase in foreign official assets in the U.S. less net increase in the U.S. official assets abroad.

⁴Includes SDR allocations to the U.S. in the 1970-72 period.

Source: Department of Commerce.

The Recent U.S. Trade Deficit

The recent trade deficit of the United States has been the kind that reflects an imbalance in *both* the trade and private capital accounts. Not only has the trade deficit not been matched and offset by a surplus in the *private* capital account, the movement in the private capital account was perverse; that is, there has been a net outflow of private capital. This means that U.S. private investment abroad has exceeded foreign private investment in the United States, in spite of the fact that foreign countries have been supplying, on net, their currently produced goods and services to the United States. Not only is foreign *private* saving not being made available to finance Federal budget deficits and private domestic investment in the United States, private savings in the United States is being directed to foreign economies. As Table II shows, given the constraint of the overall balance in the balance of payments, the net deficit on trade and private capital accounts has been matched by the net surplus in the accounts of foreign *official* institutions.

tem, such as the Bretton Woods system which was in operation from the end of World War II through early 1973, the target rate had been the officially-agreed-upon par rate. Under a dirty float system, such as the current regime, which has been in existence since early 1973, the target rate is whatever rate the intervention authority considers "appropriate." Needless to say, a target rate may not coincide with the market-determined equilibrium exchange rate.

Foreign governments, in effect, are financing the excess of our current spending over national income. The recent bulge in the trade deficit has also been accompanied by a sharp drop in the external value of the dollar.

The data indicate that the recent net inflow of resources (trade deficit) into the United States does not reflect the deliberate choice of foreign *private* economic units to invest their resources in the United States, that is, to make their savings available for our use. The data show, instead, massive purchases of U.S. assets by foreign official institutions. This, in turn, reflects official efforts to prop up the value of the dollar in foreign exchange markets.²⁰

From this perspective, the recent U.S. trade deficit can be interpreted as reflecting an excess supply of money in the United States. Given this interpretation, a link between the Federal budget deficit and the trade deficit can be found if a case can be made for the view that the deficit in the Federal budget has, at least in part, induced the excess supply of money in the United States.

How A Federal Budget Deficit Emerges

A Federal budget deficit emerges whenever Federal expenditures exceed receipts. Federal expenditures reflect prior decisions arrived at through political processes to provide for collective goods and effectuate income transfers. As such, they are less susceptible to the state of the economy than are tax revenues. Tax revenues are determined both by the tax laws and the state of the economy.

The balance in the Federal budget, therefore, reflects the complex set of forces interacting through both the political and economic systems. When expenditures exceed revenues, the resulting deficit must be financed either by borrowing or by printing money (or its equivalents, such as the sale of newly issued Government bonds to the central bank). Such a monetary accommodation of the budget deficit could occur, for example, if the debt financing of the deficit is perceived as exerting a significant upward pressure on interest rates *and* if moderating or resisting an upward pressure on interest rates is judged to be a desirable policy objective.²¹

²⁰Ironically, however, in the absence of official intervention in foreign exchange markets, the U.S. trade deficit would have been considerably smaller due to the effects of a faster and/or larger drop in the value of the dollar on the prices of foreign goods relative to those of U.S. goods.

²¹The concepts of active and passive deficits have been devised to assess the thrust of Federal budget policy. See, for ex-

A Link Between the Budget and Trade Deficits

This channel of budget-deficit-induced monetary expansion can provide a link between the Federal budget deficit and the trade deficit. Schematically, the causation would run:

Federal deficit → induced monetary expansion → trade deficit.

The available evidence on the relationship between the Federal budget deficit and monetary expansion across countries indicates that the deficit-to-money link is less than water-tight *on average*.²² Such a finding, of course, may reflect the fact that monetary policy is pursued, at least on occasions, for reasons other than accommodating the financing requirements of the government.²³ However, such a finding does not rule out the possibility that recent U.S. trade deficits reflect a monetary accommodation of persistently large U.S. Federal deficits.

The recent accelerations in money growth and inflation in the United States, in clear contrast to decelerations experienced in other countries against whose currencies the U.S. dollar has depreciated, have been accompanied by persistent Federal budget deficits

ample, Keith M. Carlson, "Estimates of the High-Employment Budget and Changes in Potential Output," this *Review* (August 1977), p. 18. The size of the active deficit indicates the extent of the unwillingness of the electorate to pay for government activities by current taxes on a pay-as-you-go basis, whereas the size of the passive deficit primarily reflects cyclical effects. The passive deficit is always an *ex post* concept whereas the active deficit may be either realized or potential. The (realized) active deficit is thought more likely to induce monetary accommodation, lest failure to do so would put greater upward pressure, compared to a passive deficit of equal size, on interest rates. However, to the extent there is no systematic relationship between active and passive deficits, the estimated link between the total budget deficit and monetary expansion will not correctly reflect the presumably more reliable underlying link between the active deficit and monetary expansion. And to the extent there is a downward bias in the estimates of active deficits, due to an upward bias in estimated potential output, the estimated effects of active deficits on monetary accommodation would be understated. For a discussion of possible upward bias in potential output, see Robert H. Rasche and John A. Tatom, "Energy Resources and Potential GNP," this *Review* (June 1977), pp. 10-24; also J. M. Perloff and M. L. Wachter, "A Production Function — Non accelerating Inflation Approach to Potential Output: Is Measured Potential Output Too High?" (paper presented at the Carnegie-Rochester Conference, April, 1978).

²²For some recent evidence, see Michael Bazdarich, "Inflation and Monetary Accommodation in the Pacific Basin," *Federal Reserve Bank of San Francisco Economic Review* (Summer 1978), pp. 23-36.

²³Also, such a finding may reflect the fact that the total deficit, rather than only the active deficit, is related to monetary expansion. In the absence of reliable measures of potential output upon which the estimates of an active deficit crucially depend, such a possibility must remain in the realm of plausible conjecture.

Table III

Money Growth, Inflation, and Budget Deficits
(1962-72 = 100)

	1962-72	1973	1974	1975	1976	1977
Money Growth¹						
U.S.	100	156	115	88	106	148
Japan	100	140	70	55	76	37
Germany	100	71	73	168	126	101
Inflation (Wholesale Prices)¹						
U.S.	100	624	900	438	219	290
Japan	100	1,436	2,854	273	464	164
Germany	100	388	788	276	229	153
Budget Deficits as a % of GNP²						
U.S.	100	58	73	469	315	257
Japan	100	150	124	442	183	568
Germany	100	70	233	752	608	423

¹Average rate of growth (percent) over 1962-72 has been set equal to 100.

²Average ratio of budget deficit to GNP over 1962-72 has been set equal to 100. Source: International Monetary Fund.

which are large compared to the historical experience (see Table III). In the absence of such a rapid monetary expansion and such an adverse development on the inflation front, the United States would not have experienced such a sizable trade deficit *accompanied by* the sizable depreciation in the external value of the dollar.²⁴ The data also indicate that the budget deficits (as measured relative to the sizes of the economies) in the United States have been associated with greater monetary accommodation than those of Japan since 1976 and Germany since 1975. Whereas the average deficits in the United States over the 1976-77 period were smaller than those of Japan and Germany, as measured relative to the base period spanning 1962-72, the average rate

of monetary expansion in the United States relative to that in the base period has been the highest.²⁵

Summary and Conclusion

It has been recently suggested that the current large Federal budget deficit is somehow linked to the surpluses in the state and local governments' budget and the deficit in the trade account. The accounting identity which relates these magnitudes offers no clue by itself as to the possible behavioral relationship that could causally link trade and Federal budget deficits.

The paper presents a theoretical frame of reference within which the recent movements in the Federal budget deficit and the trade deficit can be explained. Macroeconomics of open systems provides a key to the understanding of the recent experience. According to this view, the current trade deficit in the United States reflects primarily the fact that our rate of inflation exceeds that of our major trading partners, such as Germany and Japan, thereby making our goods and services more expensive relative to theirs. The declining value of the U.S. dollar in international currency markets and the *form* of current foreign investment in the United States suggest that an excess supply of money is the source of our inflation. To the extent that the recent excess supply of money in the United States was induced by the monetization of the historically large budget deficit, the chain of causation would run from the large Federal budget deficit to the large trade deficit, rather than the other way around.

Within the perspective of the macroeconomics of open systems then, the fundamental cause both of inflation (the fall in the internal value of the dollar) and of exchange rate depreciation (the fall in the external value of the dollar) is traced to excessive monetary expansion relative to demand, whether or not attributable to accommodation of the Federal budget deficit. Within such a perspective, nothing less than the elimination of such an excess supply of money would be an effective and enduring antidote against both.

²⁴It has often been noted that the recent decline in the external value of the U.S. dollar against such currencies as the Japanese yen and the German mark has been "too large" to be fully explained by the relative difference in *actually measured* rates of inflation or of monetary expansion. Such observations have been used in the past to reject the monetary interpretation of exchange rate movements. However, reformulation of the monetary approach which incorporated *expected* differences in rates of inflation and of monetary expansion helped to strengthen the case for it. See, for example, Thomas M. Humphrey, "The Monetary Approach to Exchange Rates: Its Historical Evolution and Role in Policy Debates," *Federal Reserve Bank of Richmond Economic Review* (July/August 1978), pp. 2-9.

²⁵This may be due to the failure of the recorded deficits to reflect the relative size of the realized active deficits, that is, a proportionately greater fraction of the German and Japanese budget deficits may be passive.

Economic Growth and Unemployment: A Reappraisal of the Conventional View

JOHN A. TATOM

THE unemployment experience of the 1970s stands in marked contrast to the possibilities for unemployment and growth which had been envisioned by most analysts and policymakers at the end of the 1960s. At that time, most observers agreed that output could not continue to grow as fast, or the unemployment rate remain as low, as in the late 1960s without an accelerating rate of inflation. Nonetheless, maintaining an unemployment rate of about 4 percent and achieving a 4 percent annual growth rate of the nation's output of goods and services appeared to be a realistic expectation.¹ Except during 1973, however, the unemployment rate has been markedly higher over the past eight years than during the prior decade.

The explanation offered for such apparently excessive unemployment is often quite simple — insufficient demand for national output.² This view of the unemployment-aggregate demand relationship draws support from an investigation of the link between changes in the unemployment rate and output growth in the 1950s and early 1960s.³ The underlying empirical relationship, embodied in what has come to be called "Okun's Law," was originally intended to provide a means of identifying the loss of national output associated with unemployment. While more detailed methods have been developed for this purpose,

the simplicity of Okun's Law, as well as its purported success in explaining and forecasting the unemployment rate, has led to its widespread acceptance.⁴

While Okun's Law has provided some insights for analysis of aggregate economic activity, unquestioned acceptance of the original empirical specification of the relationship has been unwarranted. Closer examination indicates that the original specification does not provide an accurate view of the link between changes in the nation's output and unemployment. This relationship between output growth and unemployment can be revised to capture more accurately the empirical link which existed in the 1950s and 1960s, and which continues to hold. Even the revised relationship is shown to provide only a rough explanation of the *level* of the unemployment rate. Nevertheless, variations in the rate of growth of the nation's output are a sufficiently dominant factor that the revised rule provides a reliable tool for forecasting *changes* in the unemployment rate. A significant implication of this reappraisal is that judgements concerning economic performance and the role of activist demand management policies based upon the level of, or changes in, the unemployment rate are

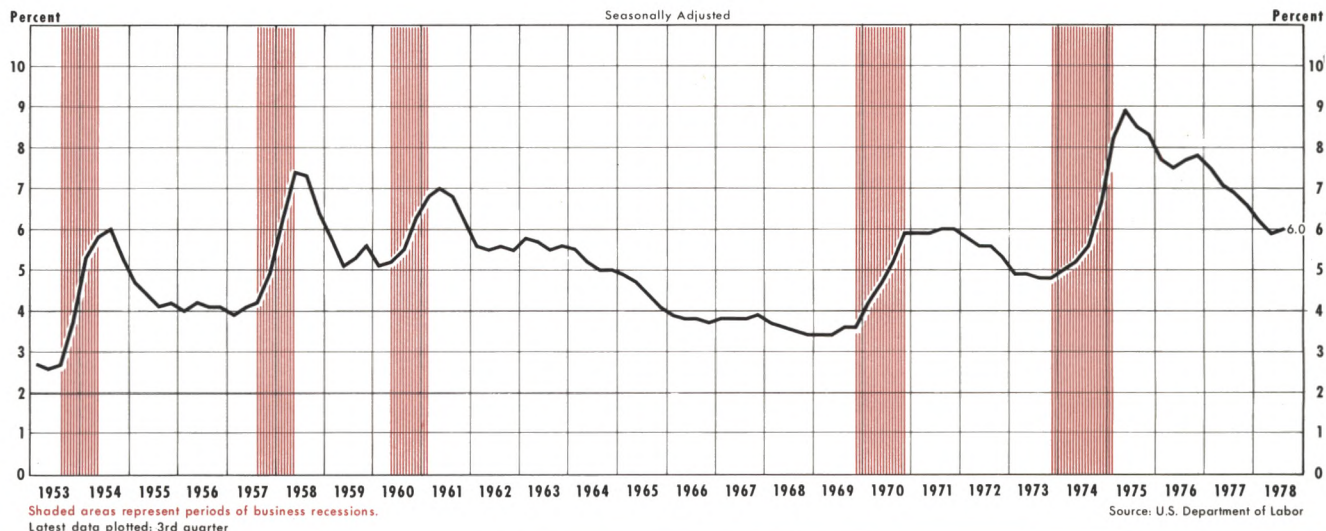
¹See, for example, Arthur M. Okun, *The Political Economy of Prosperity* (Washington, D.C.: Brookings Institution, 1970), especially pp. 60 and 100-02.

²Two of the stronger recent statements of this view may be found in James Tobin, "How Dead is Keynes?" *Economic Inquiry* (October 1977), pp. 459-68, and Arthur M. Okun, "The Great Stagflation Swamp," *Challenge* (November/December 1977), pp. 6-13.

³Arthur M. Okun, "Potential GNP: Its Measurement and Significance," in American Statistical Association, *Proceedings of the Business and Economic Statistics Section*, 1962, pp. 98-104, and reprinted in *The Political Economy of Prosperity*, pp. 132-45.

⁴This popularity is illustrated by George L. Perry's remark that "Okun's Law . . . is probably the most robust macroeconomic relationship yet developed," in "Potential Output: Recent Issues and Present Trends," *U.S. Productive Capacity: Estimating The Utilization Gap* (St. Louis: Washington University Center for the Study of American Business, 1977), p. 1; and Otto Eckstein's remark in his comment on George L. Perry, "Potential Output and Productivity," *Brookings Papers on Economic Activity* (1:1977), pp. 54-55, "It remains as true today as it was a decade ago that Okun's Law is the best predictor of aggregate unemployment." Also, the unemployment rate in the St. Louis Model has been determined by an Okun's Law relationship relating the unemployment rate to current and one quarter lagged values of the GNP gap. See Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 9 and 14, and Roger W. Spencer, "Population, The Labor Force, and Potential Output: Implications for the St. Louis Model," this *Review* (February 1971), pp. 15-23.

Unemployment Rate



seriously biased by the acceptance of the original specification of Okun's Law.

What Is Okun's Law?

In his original article, Okun used several statistical techniques to assess the relationship between unemployment and aggregate output in order to establish a measure of the output which could be produced under conditions of "full employment." The techniques used involved relating first differences of unemployment to the growth rate of output, using various measures of the gap between potential and actual output, and using a linear logarithmic relationship between employment and output and time. The benchmark assumption was that full employment and, thus, production at the economy's "potential output" rate, occurred at an unemployment rate of 4 percent. The study concluded that each percentage point of unemployment above 4 percent of the labor force implied a 3 percent "gap" of lost output.⁵ This relationship can be summarized as:

$$(1) \quad U = 4.0 + 1/3 \text{ GAP}$$

where U is the overall unemployment rate and GAP is the percentage excess of potential over actual output. When the economy's unemployment rate differs from 4 percent, the equation allows a calculation

⁵Okun, "Potential GNP," p. 100, points out that the 3 to 1 link between output growth and the unemployment rate is approximate. His "own subjectively weighted average of the relevant coefficients" implies a gap coefficient in the equation equal to 0.3125, slightly lower than the one-third figure used here.

of the size of the gap between actual and potential output.

Since Okun's original work, measures of potential output have been developed which take into account additional factors such as the use of capital and energy resources which affect productivity and potential output.⁶ Nonetheless, the use of the Okun's Law relationship as a means of explaining (or at least forecasting) the unemployment rate remains relatively widespread.⁷

Some of the difficulties with the original specification of Okun's Law may be seen by an estimate of equation (1) using quarterly data from I/1953 through III/1977. Two alternative measures of potential output are used to measure the GNP gap; the first, that of the Council of Economic Advisers (CEA), and the second based upon updated quarterly estimates by Rasche and Tatom.⁸

⁶See the discussion of the literature on potential output measures in Robert H. Rasche and John A. Tatom, "Energy Resources and Potential GNP," this *Review* (June 1977), pp. 10-24, especially pp. 10-13.

⁷According to equation (1), changes in the unemployment rate depend upon changes in the gap, which in turn depends on the difference between the rate of change in potential output (economic growth) and the rate of change in actual output. Since the unemployment rate is equally responsive to a decrease in the rate of economic growth or an increase in the rate of change of actual output, the response of the unemployment rate to either is discussed here using the terms economic growth and the rate of change of actual output interchangeably.

⁸See Peter K. Clark, "A New Estimate of Potential Output," U.S. Congress, Joint Economic Committee, Hearings on the Economic Report of the President, 95th Cong., 1st sess., January 19, 1977, pp. 39-54; and Robert H. Rasche and John A.

$$(2) \quad U = 4.58 + .325 \text{ GAP} \quad (\text{CEA measure})$$

$$(20.57)(12.55)$$

$$R^2 = .96 \quad S.E. = .279 \quad D.W. = 1.32 \quad \hat{\rho} = .87$$

$$(3) \quad U = 4.99 + .359 \text{ GAP} \quad (\text{Rasche-Tatom measure})$$

$$(11.56)(14.35)$$

$$R^2 = .97 \quad S.E. = .250 \quad D.W. = 1.32 \quad \hat{\rho} = .94$$

Both equations indicate constants which are significantly above the 4 percent level used in the original law (t-statistics are shown in parentheses). Moreover, both equations indicate significant serial correlation of the errors, even though allowance is made for a first-order autoregressive scheme. Also, when the rho-statistic is close to unity, the appropriate statistical procedure is estimation of the coefficients using a first-difference form, which in this case would mean that changes in the unemployment rate are related to changes in the GNP gap.⁹

The only change in the original statement of the relationship which has become widely agreed upon is that the unemployment rate at full employment can no longer be regarded as constant at 4 percent. Since different groups of individuals have large differences in their unemployment experience, even under high-employment conditions, changes in the composition of the labor force can have substantial effects on the aggregate unemployment rate. Recent studies of potential output allow for changes in the "full-employment unemployment rate" due to changes in the age and sex composition of the labor force.¹⁰ Such measures attempt to capture the different unemployment and participation experience of different groups within the labor force. These studies imply the use of a *variable* intercept, U_t , in equation (1), instead of the constant of 4 percent. The relationship may then be expressed as $U^* = b \text{ GAP}$, where U^* is the excess of the unemployment rate, U , over the full-employment level, U_t , and b is the responsiveness of the unemployment rate to growth, as measured by changes in the gap.¹¹

Tatom, "Potential Output and Its Growth Rate — The Dominance of Higher Energy Costs in the 1970's, in *U.S. Productive Capacity: Estimating the Utilization Gap*, pp. 67-106. The minor changes in the latter series reflect data revisions by the Bureau of Labor Statistics and an extension through the third quarter of 1977. The series used have been subsequently modified, but the conclusions are not appreciably affected by the modifications.

⁹See, for example, Jan Kmenta, *Elements of Econometrics* (New York: The Macmillan Company, 1971), pp. 289-92.

¹⁰See George L. Perry, "Labor Force Structure, Potential Output, and Productivity," *Brookings Papers on Economic Activity* (3:1971), pp. 533-65; Perry, "Potential Output and Productivity;" Clark, "A New Estimate of Potential GNP;" and Rasche and Tatom, "Energy Resources and Potential GNP," and "Potential Output and Its Growth Rate."

¹¹Perry, "Labor Force Structure," estimates such an equation using annual data and finds an estimate of b consistent with

Table I

An Estimate of the Full-Employment Unemployment Rate

Year	Rate	Year	Rate
1950	4.0	1964	4.4
1951	3.9	1965	4.4
1952	3.7	1966	4.4
1953	3.6	1967	4.4
1954	3.8	1968	4.5
1955	4.0	1969	4.5
1956	4.0	1970	4.5
1957	4.0	1971	4.6
1958	4.0	1972	4.8
1959	4.1	1973	4.8
1960	4.1	1974	4.8
1961	4.1	1975	4.8
1962	4.2	1976	4.9
1963	4.3		

Source: George L. Perry, "Potential Output and Productivity," *Brookings Papers on Economic Activity* (1:1977), p. 28.

For example, Table I shows the annual full-employment unemployment rate recently constructed by Perry.¹² The measures constructed by the Council of Economic Advisers are quite similar. The estimates indicate that the constant in the Okun's Law equation has risen from 4 percent in 1955 to about 5 percent in the 1970s. The most noteworthy effect of accounting for the change in the unemployment benchmark is that it indicates the U.S. economy was operating at full employment in 1973 and early 1974, contrary to the dominant view at that time which claimed that the economy had excess capacity.¹³

Okun's original estimate of this responsiveness. When the first-difference test used below is applied to his data, estimates of b are found which are consistent with the larger responsiveness indicated in this article. A fuller discussion of these results is available from the author in the unpublished memorandum, "An Alternative Estimate of Okun's Law."

¹²See Perry, "Potential Output and Productivity," Table 6, p. 28. Others have suggested increases in the full-employment unemployment rate above those estimated by Perry and the CEA. For example, Michael L. Wachter estimates the recent rate is about one-half of one percent above Perry's estimate. See his comments following Perry, "Potential Output and Productivity," p. 51. Also see Martin Feldstein, "The Economics of the New Unemployment," *The Public Interest* (Fall 1973), pp. 3-42, and "Unemployment Compensation: Adverse Incentives and Distributional Anomalies," *National Tax Journal* (June 1974), pp. 231-44. Feldstein argues that a more generous unemployment compensation system in the seventies has affected the opportunity cost of accepting employment offers. Such an argument suggests further increases in the benchmark unemployment rate, over and above the increases indicated by demographic factors which are estimated by Perry and the CEA and used below.

¹³See "The Debate Over Gauging the GNP Gap," *Business Week*, June 9, 1973, pp. 76-77.

Table II

Two Estimates of Okun's Law
I/1953-IV/1969*

Levels

G = CEA Output Gap:

$$U^* = .2128 G_t + .2440 G_{t-1}$$

(7.66) (8.74)

$$R^2 = .97 \quad D.W. = 1.65 \quad \Sigma \beta_i = .4568$$

$$S.E. = .196 \quad \hat{\rho} = .85 \quad (17.19)$$

G = Rasche-Tatom Output Gap:

$$U^* = .2785 G_t + .1791 G_{t-1}$$

(9.75) (6.23)

$$R^2 = .97 \quad D.W. = 1.40 \quad \Sigma \beta_i = .4575$$

$$S.E. = .196 \quad \hat{\rho} = .96 \quad (16.09)$$

First Differences

G = CEA Output Gap:

$$\Delta U^* = .2172 \Delta G_t + .2358 \Delta G_{t-1}$$

(7.79) (8.44)

$$R^2 = .79 \quad D.W. = 1.74 \quad \Sigma \beta_i = .4531$$

$$S.E. = .205 \quad (15.56)$$

G = Rasche-Tatom Output Gap:

$$\Delta U^* = .2870 \Delta G_t + .1671 \Delta G_{t-1}$$

(10.34) (5.99)

$$R^2 = .82 \quad D.W. = 2.00 \quad \Sigma \beta_i = .4542$$

$$S.E. = .190 \quad \hat{\rho} = .27 \quad (13.91)$$

* (t- statistics are shown in parentheses)

that a first-difference form of the equation is appropriate, and that each equation may suffer from the omission of other significant explanatory variables. First-difference equations are shown in the lower portion of Table II. Note that in the second equation, autoregression is a problem, even in the first-difference form, which has been removed using the Cochrane-Orcutt technique. The first difference equation estimates provide strong support for the size of the response of the level of unemployment found in the level equations.

The equations indicate that unemployment is more sensitive to the rate of change of output than the original Okun's Law suggests.¹⁶ Conversely, this means that the change in the output gap associated with a given change in the unemployment rate is smaller than implied by the original specification. The sum of the coefficients on the current and lagged values of the gap terms indicates a gap coefficient close to 0.45. The sum coefficient indicates that a 2.22 percent (1/0.45) output loss is associated with each one percent of unemployment in excess of the full-employment level.

This change has important implications for the conduct of monetary and fiscal policy. If unemployment is more sensitive to growth than the original formula indicates, the GNP gap associated with any observed level of unemployment would be smaller. Thus, the increase in output required at any time to achieve full employment is smaller than the original relationship indicates. Also, high-employment budget estimates which are based on overly optimistic assess-

These statistics partly indicate the misspecification introduced by omitting a significant lagged value of the gap. In spite of the specification errors, it is useful to consider the size of the forecast errors using the equation. On average, the unemployment forecast is 0.74 percentage points above the actual rate during 1974, and 0.75 percentage points below the actual rate observed from the second quarter of 1975 through the beginning of 1977.

¹⁶A look back at one of Okun's methods of estimating this responsiveness reveals the difference in results. When Okun estimated the relationship between quarterly changes in the unemployment rate and actual output growth, he omitted a significant lagged output growth term which, if it had been included, would have yielded the results above. For example, when changes in the unemployment rate for the civilian labor force age fourteen and over are used with real GNP growth for the period III/1947-IV/1960, Okun's first test, the constant is 0.30 and the output growth coefficient is -0.31, essentially Okun's results (-0.30) for the period beginning in II/1947. When output growth in the prior quarter is added to the equation, its coefficient (-0.21) is significant (t = -5.78). When added to the current quarter growth coefficient (-0.23), the sum (-0.44) is approximately the size of the gap coefficient found above. The constant in such an equation is 0.42, while the R² is 0.70, D.W. = 1.80, S.E. = 0.31. The standard error is markedly lower than when only current output growth is included (0.40).

Another Look at Okun's Law

Estimates of equations of the form $U^* = b \text{ GAP}$ for the period prior to the 1970s, I/1953-IV/1969, are shown in Table II. The full-employment unemployment rate series used in each case is that prepared by the CEA.¹⁴ A lagged value of the gap is significant in each case, and there is significant positive autoregression in both of the equations.¹⁵ Again, the rho-statistic is sufficiently close to unity to indicate

¹⁴When constants are included in the equations in Table II they are not statistically significant and have no effect on the gap coefficients (to two decimal places). This result indicates that the full-employment unemployment rate series used adequately captures the actual changes in the rate. Additional lagged gap terms are also not significant.

¹⁵Stephen K. McNees, "The Current Business Cycle in Historical Perspective," Federal Reserve Bank of Boston *New England Economic Review* (January/February 1978), pp. 44-59, uses the CEA data to estimate an Okun's Law equation and concludes that it "explains" unemployment from 1973 through 1977 quite well. The equation he uses contains only the current gap. A replication of his equation yielded a rho value of 0.88 and Durbin-Watson statistic of 1.40.

ments of this output gain provide a mistaken impression of the possibilities for new spending initiatives and tax cuts or understate high-employment Federal borrowing requirements. Finally, attempts to change the unemployment rate through policies which temporarily stimulate or slow output growth would yield larger unemployment rate changes than anticipated. Such policy errors would promote greater cyclical variability of the economy's output.

The Unemployment Rate in the 1970s

Dynamic simulations of the unemployment rate level equations in Table II do not forecast the unemployment rate in the 1970s well using the respective GNP gap estimates.¹⁷ On the other hand, the evidence in Table II indicates that neither equation should be expected to perform well, since the statistical properties of the equations show the appropriate statistical relationship is the first-difference form. That is, an equation of the form proposed by Okun (augmented for a lagged response) can give reasonable predictions of changes in the unemployment rate, but it does not predict the actual level of the unemployment rate very well. The role of the adjustment for autoregression in obtaining the excellent fit of the level equations during the sample period is very large. Other factors may be of too great importance to allow one to forecast unemployment *levels* well using only information on output gaps.

Simulations of the first-difference equations forecast much better.¹⁸ For the forecast period I/1970-III/1977, the average error in predictions of changes in the excess unemployment rate is 0.011 and the root-mean-squared error is 0.23, using the CEA equa-

¹⁷The appropriate test of the forecasting ability of the equations are dynamic simulations which omit information on the past forecast errors during the out-of-sample period. Static simulations take into account the lagged error term in the equations. The mean error and root-mean-squared error for the CEA level equation for the period I/1970-III/1977 are -0.22 percent and 0.50 percent, respectively. The mean error of the dynamic simulation of the Rasche-Tatom equation of 0.46 percent indicates underprediction and the root-mean-squared error is 0.62 percent. Static simulations of the level equations forecast better for the same period, yielding mean errors and root-mean-squared errors of -0.04 and 0.23 percent, respectively, for the CEA equation and 0.06 and 0.17 percent, respectively, for the Rasche-Tatom equation. Thus, static forecasts using either equation may provide fairly accurate one quarter ahead forecasts while not "explaining" unemployment very well.

¹⁸Since the estimate of the first-difference equation using the Rasche-Tatom gap measures includes the lagged error term to eliminate autocorrelation, the simulation reported is again a dynamic one. The simulation of the equation which uses the CEA gap measure is a static simulation since the estimated equation is an ordinary least squares (OLS) estimate.

Table III

Two Estimates of Okun's Law I/1953-III/1977*

Levels

G = CEA Output Gap:

$$U^* = .2229 G_t + .1960 G_{t-1} \\ (10.67) \quad (9.41)$$

$$R^2 = .98 \quad D.W. = 1.46 \quad \Sigma \beta_1 = .4190 \\ S.E. = .200 \quad \hat{\rho} = .85 \quad (21.70)$$

G = Rasche-Tatom Output Gap:

$$U = .2770 G_t + .1824 G_{t-1} \\ (13.19) \quad (8.72)$$

$$R^2 = .98 \quad D.W. = 1.40 \quad \Sigma \beta_1 = .4594 \\ S.E. = .187 \quad \hat{\rho} = .95 \quad (21.33)$$

First Differences

G = CEA Output Gap:

$$\Delta U^* = .2413 \Delta G_t + .1826 \Delta G_{t-1} \\ (11.68) \quad (8.84)$$

$$R^2 = .80 \quad D.W. = 1.94 \quad \Sigma \beta_1 = .4239 \\ S.E. = 2.02 \quad \hat{\rho} = .24 \quad (16.38)$$

G = Rasche-Tatom Output Gap:

$$\Delta U^* = .2874 \Delta G_t + .1674 \Delta G_{t-1} \\ (14.33) \quad (8.37)$$

$$R^2 = .84 \quad D.W. = 2.05 \quad \Sigma \beta_1 = .4548 \\ S.E. = .181 \quad \hat{\rho} = .30 \quad (18.01)$$

* (t- statistics are shown in parentheses)

tion in Table II. The comparable errors using the Rasche-Tatom equation are 0.08 and 0.18, respectively. While the average error in each reflects the inability of the first-difference equations, on average, to explain fully the higher levels of the unemployment rate since the end of the 1960s, the size of the average error is not significantly different from zero. The root-mean-squared error of the first-difference equation forecasts are only slightly different from the standard error in the sample period.

When the equations in Table II are reestimated through the third quarter of 1977, there are only slight changes in the equations. These equations are shown in Table III. The fit of the Rasche-Tatom equations is slightly better over the longer period, while that of the CEA equations is slightly worse. Again there is agreement between the gap coefficients in both the level and first-difference equations. The sum of the coefficients in the Rasche-Tatom

equations is about the same as in the earlier period while the sum in the CEA equations falls to 0.42. The Chow test indicates the absence of structural change in the post-1969 period in all cases but one.¹⁹ Thus, the quality of the level forecasts from the simulations of the equations estimated over the 1950s and 1960s does not appear to arise from a change in the structure of the empirical relationship.

Okun's Law, even when revised, provides only a very rough explanation of the unemployment rate in the 1970s. While the evidence shows that changes in the gap, due to differential growth rates in potential and actual output, have a significant impact on *changes* in the unemployment rate from quarter-to-quarter, and that this relationship does appear to have remained stable in the 1970s, it also indicates that the relationship between the GNP gap and the level of the unemployment rate is not sufficient to explain satisfactorily the high levels of unemployment since 1969.

Prospects for the Unemployment Rate

Using a device like Okun's Law, the prospects for unemployment rate developments may be readily stated. According to the revised "law," the unemployment rate declines roughly 0.45 percentage points per year for each one percent excess of real GNP growth over the rate of growth of potential output.

For example, the Administration recently forecast a rate of real GNP growth for 1978-79 of 4.75 percent and projected a continuation of this growth through 1983 to achieve their goals.²⁰ The accompanying path of the unemployment rate indicates a decline of 0.4 percentage points per year, with the rate reaching 4.9 percent at the end of 1981 and 4.0 percent in IV/1983. While it is not explicitly stated, the estimated reductions appear to be based upon an assumed rate of growth of potential output of 3.5 percent per year together with the old "three to one" link between growth and unemployment given by the original form of Okun's relationship. Such a rate of

growth of potential output was discussed by the CEA in 1977.²¹

The same assumptions about the growth of output (4.75 percent) and potential output (3.5 percent) give a much larger reduction in the unemployment rate over the next five years, however, when the revised rule is used. The reduction of the unemployment rate to the full-employment benchmark used here, 4.9 percent, would occur in the second quarter of 1980 rather than at the end of 1981, as in the budget projection. Moreover, the assumption of a 3.5 percent rate of growth of potential output is probably optimistic and thus understates the rate of reduction of the GNP gap. This means that the unemployment rate would fall faster than the Administration estimate. The average annual growth rate of potential output from the recession trough through the third quarter of last year is only 3.0 percent in the Rasche-Tatom estimate, as opposed to the 3.5 percent projection in the CEA data.²² If continued, the excess of actual over potential growth would be 1.75 percent per year with the Administration's forecast of GNP growth, resulting in an annual reduction of about 0.8 percentage points in the unemployment rate ($0.45 \times 1.75 = 0.7875$), about twice the rate of decline estimated by the Administration.²³ Should such actual and potential output growth be realized from the second quarter of 1978 on, the full-employment unemployment rate benchmark used here of 4.9 percent would be achieved in the third quarter of 1979 rather than at the end of 1981, as projected in the budget. Viewed in terms of timing, recent budget policy proposals aimed at achieving an unemployment target by a certain date in the future appear to be much more stimulative than the proposed budget indicates.²⁴

²¹See Council of Economic Advisers, *Economic Report of the President*, 1977, pp. 55-56.

²²See Rasche and Tatom, "Potential Output and Its Growth Rate," pp. 84, 100-102.

²³The contrast may also be seen with reference to data from the recent past. The unemployment rate in the first quarter of 1978 was 6.2 percent, 2.7 percentage points lower than the unemployment rate peak in the second quarter of 1975. Over this period, real GNP growth averaged 5.0 percent per year. The post recession potential output growth rate of 3.0 percent annually, together with the 0.45 rule, indicates a decline of 2.5 percent over these eleven quarters, only slightly below the reduction in excessive unemployment actually observed. Using the one-third estimate of the responsiveness and 3.5 percent annual potential growth implies a reduction of only 1.4 percentage points, much smaller than the reduction which actually occurred.

²⁴See Keith M. Carlson, "Economic Goals for 1981: A Monetary Analysis," this *Review* (November 1977), pp. 2-7, for an analysis of an earlier Administration plan. He points out the implications of policies to achieve such rapid real GNP

¹⁹The first-difference equation using the CEA output gap measures has a significant autoregressive disturbance term in the longer period which is not significant in the earlier period. A Chow test of structural change using both the ordinary least squares and generalized least squares estimates of the equation indicates structural change at the one percent significance level in the generalized least squares estimate.

²⁰See U.S. Management and Budget Office, *The Budget of the United States Government: Fiscal Year 1979*, pp. 29-33.

Summary and Conclusion

Okun's Law — a relationship between the unemployment rate and the level of the GNP gap — was not originally intended to explain the unemployment rate, but instead, to provide a means for measuring potential output. In recent years, alternative methods have been developed to measure potential output which have a stronger basis in economic theory and statistical method. Nonetheless, use of the relationship as an explanation of the unemployment rate has continued.

An examination of Okun's original formulation as an explanation of unemployment shows that it is not very satisfactory. Besides recent evidence showing that the full-employment unemployment rate has risen since the original work, the evidence presented here points to a larger responsiveness of the unemployment rate to real output growth.

growth for accelerating inflation and negligible real Federal spending growth.

When the revised pieces of Okun's Law are re-assembled, a serious statistical problem remains. The coefficient of a lagged error term required to eliminate autoregression in the level equations is near unity and plays a major role in the high quality of the statistical results. Forecasts based upon the level equations tend to be of significantly lower quality beyond a sample period since this disturbance term cannot be taken into account.

Nonetheless, the first-difference equations and the simulation experiment indicate strong support for the larger responsiveness found in the level equations and, more importantly, show that quarterly changes in the level of the unemployment rate are dominated by economic growth. Thus, the rule of thumb developed here may be a useful tool for forecasting. This rule, however, indicates that the unemployment rate is more sensitive to economic growth than most observers may have believed and suggests the use of increased caution in attempts to guide the economy by activist demand policies.



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