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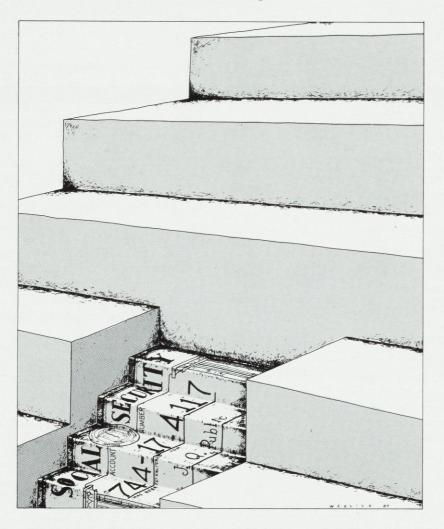
VOLUME LXXIV, NO. 2, MARCH/APRIL 1989, ECONOMIC REVIEW

2	The Federal Budget Deficit and the Social Security Surplus Thomas J. Cunningham	Though the surplus in the Social Security trust fund provides some relief—on paper—for the federal budget deficit, "on-budget" fiscal reform offers a more permanent route to deficit reduction.
14	Capital Requirements for Banks: A Look at the 1981 and 1988 Standards Larry D. Wall	Over the last decade, regulators have instituted new capital standards for banking organizations. This article considers banks' reactions to these requirements as well as the effectiveness of capital regulations in fostering bank solvency.
30	F.Y.I. R. Mark Rogers	Tracking the Economy: Fundamentals for Understanding Data
50	Book Review Thomas J. Cunningham	The Netherlands and the Gold Standard, 1931-1936: A Study in Policy Formation and Policy edited by Richard T. Griffiths
		The Gold Standard and the International Monetary System 1900-1939 by Ian M. Drummond

FEDERAL RESERVE BANK OF ATLANTA

The Federal Budget Deficit and the Social Security Surplus

Thomas J. Cunningham



Off-budget surpluses, such as those experienced by the Social Security program, are typically incorporated into federal budget figures, but these surpluses should not be viewed as panaceas for the current fiscal deficit. This article considers the mathematics of budget dynamics, the projected performance of the Social Security trust fund, and the influence of these two forces on the federal budget now and in years to come.

he federal government's recent budget deficits, which in dollar figures are unprecedented in U.S. history, have sparked a great deal of concern. Potential consequences ascribed to these deficits include a myriad of problems, particularly possible inflation and massive trade imbalances. So great has been this apprehension that some measure of political consensus has emerged favoring reduction in the deficits' size, with one major result being the Gramm-Rudman-Hollings balanced budget act.

At the same time, more attention has been devoted to the dynamics of the Social Security tax and benefit system, which is producing an unprecedented programmatic surplus. This growing surplus is projected to peak midway through the second decade of the next century. Thus, at the very least, the Social Security surplus will help reduce current and intermediate-term federal budget deficits.

This development is not exactly news. Owing to reforms in the late 1970s and early 1980s, the dynamics of Social Security now ensure a substantial program budget surplus, peaking around 2015 and, as currently estimated, vanishing around 2030. These projections factor in the current design of Social Security tax and benefit laws as well as demographic trends. They do not include various health insurance programs associated with Social Security.

Despite the fact that this reform has been in place for several years, considerable confusion still appears to surround the size, significance, and implications of the trust fund's surplus.² In particular, many analysts expect enormous federal budget surpluses in the not-too-distant future. It is true that if real wages and economic activity were to grow at heretofore unseen rates while inflation stayed low, the Social Security trust fund would accumulate assets without end, potentially absorbing the entire national debt-provided, of course, other sources of the federal deficit are under control. Under these remarkable circumstances, though, other trust funds would also be in a position to accumulate assets without end. With rather more reasonable assumptions about the future, good things will still happen, but the surplus's ultimate consequences are far less dramatic.

This article explores the Social Security surplus and some of its implications in the overall context of the federal budget deficit. It begins by describing the nature and possible future course of the trust fund surplus. After setting forth the relationship of the Social Security surplus to the entire budget deficit and the mathematics of budget dynamics in a growing economy, the article probes some long-run problems.

The Surplus . . .

Before its reform in 1977 and again in 1983, the Social Security system was financed essentially on a nonactuarial, pay-as-you-go basis. That is, Social Security payroll taxes financed current Social Security expenditure, and over time the tax revenues and income maintenance expenditures roughly equalled one another. With a series of small surpluses, the Social Security trust fund grew gradually, having accumulated about \$40 billion by the mid-1970s. The program's dynamics then resulted in major deficits with no apparent near-term remission. These shortfalls drained the trust fund's holdings down to about \$12 billion by the time of the 1983 program reform.

When Social Security was first conceived, the pay-as-you-go approach was appropriate, or at least practical, for three reasons. First, since the original benefits were disbursed almost immediately after the legislation was implemented, there was essentially no trust fund to draw upon; thus, as a matter of expediency, some element of pay-as-you-go financing was necessary. Second, when the Social Security Act was enacted, the retirement age—at which payments of benefits began-was loosely in line with the life expectancy of the average working male. Third, if the program was solvent under the initial composition of Social Security taxpayers and benefit recipients and that composition was stable, whether benefits were paid from a trust fund or from current tax revenue was not an issue; the individual tax burdens would be, on average, identical and stable over time.

Two events—one foreseeable and one unforeseeable—made the pay-as-you-go approach

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Table 1.
A Projection of the Performance of the Social Security System
(dollar figures in billions)

Year	Social Security Assets	Change in Social Security Assets (Social Security Surplus/Deficit)	Gross National Product (GNP)	Ratio of Social Security Surplus/Defici- to GNP
1988	109		4,736	
1989	155	46	5,048	0.00901
1990	212	57	5,382	0.01065
1991	277	65	5,734	0.01137
1992	352	75	6,123	0.01225
1993	438	86	6,532	0.01318
1994	536	98	6,954	0.01405
1995	646	110	7,399	0.01481
1996	769	123	7,873	0.01562
1997	905	137	8,376	0.01632
2000	1,409	504	10,048	0.01671
2005	2,632	1,223	13,563	0.01803
2010	4,460	1,828	18,147	0.02015
2015	6,763	2,303	24,006	0.01919
2020	9,124	2,361	31,483	0.01500
2025	10,996	1,872	41,178	0.00909
2030	11,867	871	54,048	0.00322
2035	11,240	-627	71,169	-0.00176
2040	8,840	-2,400	93,621	-0.00512
2045	3,799	-5,041	122,907	-0.00820

All dollar figures are in current-dollar terms and are not tied to an index.

Source: Board of Trustees of the Federal Old-Age and Survivors Insurance and the Federal Disability Insurance Trust Funds (1988); projection alternative II-B, various tables.

infeasible. The predictable event was the lengthening of life expectancies. As mentioned earlier, when Social Security was created, the retirement age was set about in line with the average life expectancy of the ultimate Social Security recipients. As the beneficiaries of the Social Security system began to live longer, though, the overall level of benefits to be paid and financed rose. The unforeseeable event was the baby boom, parented by the "baby-bust" generation of the Depression. By itself, this bust-and-boom combination makes a pay-as-you-go approach a particularly easy short-run course to follow since the immediate result is a dis-

proportionately large number of workers per retiree. As long as the ratio of workers to retirees is on the rise, the burden of support placed on the labor force progressively eases. As the babyboom cohort matures, though, this process inverts itself, creating a disproportionately large number of retirees per worker. In 1986 each Social Security recipient was supported by 3.3 workers. By the middle of the next century, this ratio is expected to fall to less than two.³

The long-term actuarial infeasibility of the system, coupled with its middle-term potential for a surplus and a short-term substantial deficit, created a mandate for the reforms that took

place in 1977 and 1983, when the Social Security system was reconstructed on a more actuarially sound basis. Payroll tax hikes were phased in over a period of time with the explicit intent of establishing a surplus in the Social Security trust fund. This development will help the fund satisfy future obligations that could not otherwise have been met given the earlier Social Security revenue provisions and the demographic bulge. Thus, the large future deficits that would have ensued in the Social Security system will be offset by the sale of assets accumulated between now and the time the population bulge retires.

Table I shows one likely outcome of the Social Security system given current legislation and demographics. Average inflation and real growth are assumed, as is a population that ages in about the same manner as today's. (The underlying reasonableness of this projection, alternative II-B prepared by the Old-Age, Survivors, and Disability Income [OASDI] fund trustees, will be discussed shortly.) The table reflects a growing surplus in the trust fund through the turn of the century, with a deficit not occurring until the middle of the twenty-first century, about as far into the future as the entire history of the program to date.

The OASDI trustees actually make four projections of the trust fund's behavior, all spanning a 75-year horizon. The major difference between each assumption set is the projected demographic movement. Over the forecast horizon virtually all of the beneficiaries have already been born. Thus, the only uncertainties concern birth rates and labor force participation rates rather far off into the forecast. Alternative I, the trustees' "optimistic" assumption set, has a fertility rate of 2.2 after 2012; under this scenario, the ratio of covered workers to beneficiaries would fall to just under 2.5 around 2030 and then slowly rise. The "pessimistic" alternative III has a fertility rate of 1.6 after 2012; the coveredworker-to-beneficiary ratio falls to under two around 2030 and then declines to just over one by the projection's end. Alternatives II-A and II-B follow identical worker/beneficiary paths with the ratio slowly declining to just under two-but operate under different economic performance assumptions.

The economic suppositions differentiating the forecast paths vary appropriately with their

respective scenarios. Real growth is quite high under alternative I and falls to historically anemic levels under alternative III. Similarly, inflation is well behaved under alternative I, falling to 2 percent as measured by the Consumer Price Index for 1993 and thereafter, whereas price pressures are historically high under alternative III, averaging 5 percent after 1994. Real wage gains, real interest rates, and unemployment rates vary similarly. The assumptions under II-A and II-B are intended to "bracket" the consensus long-run demographic and economic performance outlooks. Alternative II-B, which contains the more pessimistic economic assumptions of the two scenarios and is usually the alternative discussed, shows the trust fund running out of assets around the middle of the next century. Alternative II-A projects a substantial diminution of assets, but a positive amount still remains at the end of the forecast horizon.

... And the Deficit

The government is not required to, and thus does not, follow generally accepted accounting principles (GAAP). Instead, the reported budget basically reflects a cash accounting system, as opposed to an accrual accounting system. Under cash-basis accounting and unlike GAAP, no attempt is made to consider either revenue that is due (accruals) or, more importantly, money that the government owes (liabilities). The budget simply reports on actual revenues and disbursements. As a result, expenditure programs undertaken today that have substantial long-term spending implications may have little effect on the currently reported deficit. For example, most entitlement programs carry substantial unfunded future liabilities that do not appear in reported budgetary shortfalls. Only in the case of some multiyear contracts, such as some military acquisition projects, where the "authorization" budget and the "outlay" budget differ, are future liabilities explicitly recognized. Even this method does not begin to approximate standard capital budgeting.

In the late 1960s the government began systematically reporting its budget on a strictly unified basis, representing the combination of what had previously been "on-budget" and

"off-budget" items. "On-budget" items represent typical government expenditures and general tax revenues. "Off-budget" items, on the other hand, are usually expenses that are in some way supported by an independent funding mechanism. Currently the only major off-budget item is Social Security. In its case, benefits and expenditures are not decided upon each budget year, and the payroll taxes that support the system exist apart from the general revenue provided by corporate and personal income taxes.

The unified budget concept makes great economic sense since interest in the federal budget stems from the desire to know basically what the government pays out and receives. The bottom-line question is whether the federal government, as a whole, needs to borrow. In this context, the fact that the Social Security program has a net surplus or deficit is of little more intrinsic interest than, say, whether the U.S. Forest Service has one.

Social Security may, however, be different enough from other income transfer programs to warrant some special consideration. In that it draws upon specific and separate (tax) revenues for its operations, Social Security resembles a standard pension plan. Nonetheless, in the event that the tax revenue and accumulated trust fund balance is not sufficient to meet the obligations of the Social Security system, the government would likely put up general tax revenues to counteract the revenue shortfall.

Regardless of the appropriateness and extent of the accounting separability of the Social Security system, it is administered as a somewhat independent program, and its surpluses or deficits are, appropriately, counted in the reported unified budget. Perhaps inappropriately, they are also counted in the Gramm-Rudman-Hollings deficit reduction legislation. The effect of the Social Security surplus on the unified budget total is reported in Table 2, which shows budget projections from the Congressional Budget Office (CBO) through the next five years. (The numbers in the table reflect the CBO projections released in January 1989.) Social Security dominates the off-budget item category.

The on-budget baseline estimates show a deficit that rises slowly from \$211 billion for fiscal year 1989 to about \$239 billion by the end of

the forecast horizon. (Baseline budget estimates assume that no changes will take place in the laws governing current expenditure and tax programs. Thus, amounts can change, but only in already-determined ways.) Over the same time, the off-budget (Social Security) surplus is moving from \$56 billion to \$117 billion. As a result, the reported deficit is projected to shrink from \$155 billion to \$122 billion. If Social Security is treated as a program with a political and economic life essentially independent of the rest of the federal budget, this deficit reduction is simply an accounting illusion, and no real deficit-reduction progress is being made.⁴

Admittedly, this conclusion is not entirely fair. Another component of federal spending that the government has absolutely no control over is interest payments on debt already outstanding. The debt must be serviced, or the government will be in default. This interest payment is expected to be \$169 billion in fiscal year 1989, rising to \$206 billion by the end of the forecast. Thus, the on-budget deficit, net-of-interest, is actually falling over the five-year horizon by \$9 billion. Nevertheless, the growing federal debt associated with the budget deficits should be the cause for some concern.

A Digression on Budget Dynamics

One of the most important problems associated with a continuing federal budget deficit is its long-run sustainability. Aside from questions of the deficit's overall desirability (or lack thereof), the first and maybe most obvious question is whether the current fiscal policy can be continued. That is, can historically large nominal deficits be sustained into the indefinite future?

A useful method of considering the deficits' sustainability is to subtract interest payments from the rest of the unified budget balance and to treat the result as the "basic" or "primary" deficit. This primary budget balance reflects actual programmatic fiscal policy. Interest payments depend in large measure on the outstanding debt, which is the result of previous budgetary decisions and is not something that the current session of Congress can control. The debt has already been sold and carries with it an

Table 2. Budget Projections, 1989-94

(by fiscal ve	ear, in billions	of dollars)
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	1989	1990	1991	1992	1993	1994
		Off-B	udget (Social Se	ecurity)		
Revenues	267	290	312	333	355	379
Outlays	211	222	234	243	252	261
Surplus	56	68	79	90	103	117
		On-Bud	get (All Other P	rograms)		
Revenues	715	779	828	876	925	980
Outlays	926	988	1,047	1,101	1,158	1,219
Deficit	211	209	219	225	233	239
			Total			
Revenues	983	1,069	1,140	1,209	1,280	1,359
Outlays	1,138	1,209	1,280	1,344	1,410	1,480
Deficit	155	141	140	135	129	122

Source: U.S. Congress, Office of the Budget, The Economic and Budget Outlook: Fiscal Years 1990-1994, January 1989.

unavoidable service burden. Without outstanding debt, the unified budget deficit would coincide with the primary budget deficit.

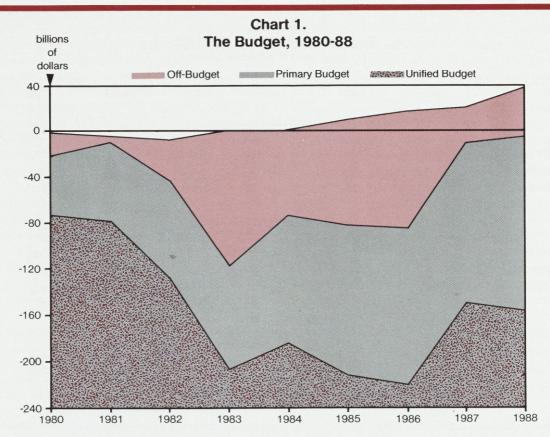
The question of whether the budget deficit can be sustained hinges on the government's ability to sell the debt necessary to finance whatever unified budget deficit occurs each period. In turn, one condition that is necessary to selling continuously more debt is that the ratio of debt to income (say, Gross National Product, or GNP) not be growing constantly. That is, a necessary, but perhaps not sufficient, condition for the feasibility of a continuing deficit is that the debt-to-income ratio not increase without limit.⁶

If the primary budget shows a deficit as a constant and fixed proportion of GNP, the condition for the debt-to-GNP ratio's stability is that the real rate of growth in the economy exceeds the after-tax real rate of interest. If the primary budget is in surplus, this real growth/real interest condition can be relaxed to permit stability with the real interest rate exceeding the

real growth rate by some amount dependent upon the size of the primary budget surplus.⁷

Chart I depicts the relationship between the reported (unified) budget deficit, the primary budget balance, and the off-budget surplus from 1980 through 1988. The vertical distance between the unified budget deficit and the primary deficit represents debt service, that is, net interest payments on the outstanding federal debt. Again, this debt service changes (along with debt) because of two financing needs: (1) the fundamental decisions about programmatic expenditure and taxation, which are the primary determinants of the primary budget condition; and (2) the debt service from financing previous unified budget deficits.

This chart depicts a dramatic divergence between the primary and unified deficits. The substantial increase in federal spending in fiscal years 1981-83 resulted in a large accumulation of debt, and thence debt service. Thus, even though the primary budget is essentially moving into balance in fiscal year 1988, the unified



Even though the primary budget is essentially moving into balance in fiscal year 1988, the unified deficit moves in the opposite direction of the primary deficit, with a mild worsening from its 1987 level.

Source: U.S. Congress, Office of the Budget, *The Economic and Budget Outlook: Fiscal Years 1990-1994*, January 1989; and *Economic Report of the President*, Washington, D.C., February 1988.

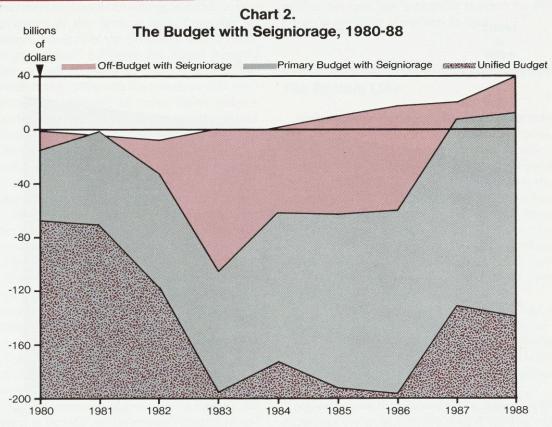
deficit, for the first time, actually moves in the opposite direction of the primary deficit, with a mild worsening from its 1987 level. Also shown in Chart I is the steady improvement of the off-budget fiscal condition, which moves to a surplus of almost \$40 billion in fiscal year 1988.

If the concern over the deficit revolves around the act of financing it by selling bonds to the public, including seigniorage in measures of the deficit is important. When seigniorage—that is, the revenue gained from money creation—is incorporated as part of the primary budget condition, the result is a more appropriate gauge of the deficit (see Chart 2, which includes overall government revenue). After netting out bonds purchased by the Federal Reserve in the course of conducting monetary policy, the primary budget turned to a slight surplus in 1987. Given the pattern of the primary budget without sei-

gniorage, one can expect that the primary budget with seigniorage will improve further in the current fiscal year.

Overall, then, the budget dynamics picture does not look awful. The primary budget is in surplus, with interest on debt accounting for virtually all of the unified deficit, regardless of how that shortfall is measured.

From a baseline budget perspective, in fact, the deficit would certainly appear to be under control even though it does not meet the Gramm-Rudman-Hollings deficit reduction targets. This view is illusory, however. Chart 3 shows unified budget, primary budget, and off-budget projections through 1994. The chart portrays how the Social Security surplus disguises the major cloud on the budget horizon: namely, the difference between the primary and unified budgets, which grows through the end of the forecast.



Netting out bonds purchased by the Federal Reserve in the course of conducting monetary policy results in a slight surplus in the primary budget in 1987 and 1988, though the unified budget still worsens between those two years.

Source: See Chart 1.

Without the added debt service, this difference would not occur. Since, however, programmatic expenditures on a baseline basis will not fall at a rate that would balance the growth in interest expenses, the on-budget budget deficit will rise. This growth remains fundamentally quite troubling. The deficit relief offered by the budget's dynamics comes primarily from the actuarially fair Social Security program, and not from some underlying reduction in the on-budget component of the federal deficit.

The Long-Term Issues

The major long-term problem with this scenario is the declining ratio of workers to retirees and the then-incumbent unified budget deficit that will occur when Social Security unwinds its current surplus. That the Social Security trust fund should build up a sufficient stock of assets to cover its liabilities is not relevant in and of itself. The trust fund will still, at some future date, have to sell off these Treasury security holdings when Social Security benefits exceed the program's tax revenue. At that point, by definition the unified budget deficit will grow. Whether this deficit turns into a substantial burden depends in large measure on what happens to the on-budget side of the unified budget. Here lies the problem.

Suppose the current unified budget were balanced and remained in this state over the next few decades. (Time horizons here are intentionally vague owing to the obvious uncertainty surrounding the size and duration of the Social Security trust fund surplus. The discussions

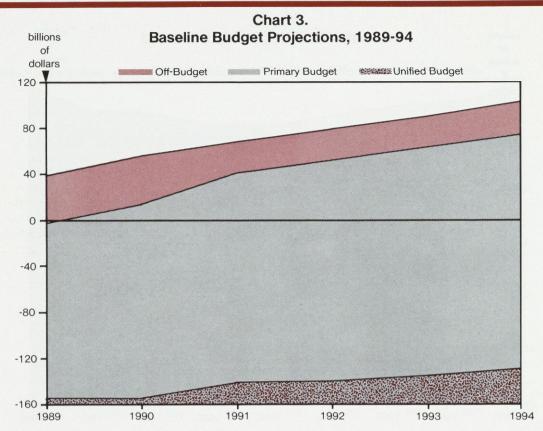


Chart 3 extends Chart 2 through 1994 to show how the Social Security surplus masks the major cloud on the budget horizon—the difference between the primary and unified budgets, which grows because of interest payments on past debt.

Source: U.S. Congress, Office of the Budget, The Economic and Budget Outlook: Fiscal Years 1990-1994, January 1989.

sion here follows alternative II-B of the OASDI trustees, in which the trust fund peaks at just less than \$12 trillion around 2030, and is exhausted in 2050.) The significant buildup of the Social Security trust fund would be financing an equivalently sized on-budget deficit, which only becomes a problem when the trust fund starts buying fewer bonds because of a decreasing surplus induced by more retirees. Two possible responses by the on-budget government are available.

The first alternative is for the on-budget government sector to ignore the change in the trust fund's finances. This strategy would result in an increase in the unified deficit equal to the reduction in the amount of bonds that the trust fund buys. This alternative is an easy one to choose, because maintaining a balanced unified budget would become progressively more

difficult since programmatic expenditures would have to be cut by ever larger amounts as the trust fund's purchases decline. Thus, although a growing deficit is an easy path to take, the unified deficit may grow large if the trust fund must eventually stop buying and ultimately sell off its assets.

To meet the difficulties associated with this eventual asset sale, some analysts have advocated that the Social Security trust fund begin to accumulate foreign, rather than U.S. Treasury, securities. By doing so, when these assets are sold, the result would be a rather painless transfer into the economy from abroad of the income needed to fund Social Security's obligations. Though attractive at first glance, this plan does not truly address the problem of the intereconomy transfers that would have to occur in the future.

When selling assets abroad, one must find purchasers that are both willing and able to buy the assets at the time of sale. Consider an extreme example of the problems such a situation may cause. Suppose the Social Security trustees had invested in Latin American securities in the 1970s with the intention of financing through the sale of those loans today's benefit expenditure. In many cases, the assets acquired during the last decade are now selling far below what the buyers expected at the time of original purchase. From this example, one can see that purchasing securities from a specific foreign country now, with the intention of having the other nation either retire or refinance from other sources the securities at maturity, or simply selling them on the open market, may later prove to be a mistake.

A better approach might be for Social Security's trustees to continue amassing U.S. Treasury securities with the intention of selling them abroad in the future. This strategy would eliminate the country-risk problem associated with accumulating foreign assets. The supposition that the rest of the world would be willing to purchase U.S. Treasury securities in the middle of the next century is reasonable as long as the budget is brought under enough control to ensure that foreign capital markets would willingly purchase the trust fund's large supply.

The second alternative is to cut spending on programs. This action would not be easy or popular, especially on a continuing basis. Under alternative II-B, Social Security reaches a maximum surplus around 2010 of a little over 2 percent of GNP. By the time the trust fund runs out of assets in the year 2045 or so, OASDI is running a deficit of not quite 1 percent of GNP; hence, a net turnaround of about 3 percent of GNP occurs over roughly 30 years. Maintaining a balanced unified budget would then require a proportionate reduction of on-budget expenditure, or an increase in taxes (Social Security or otherwise) of 3 percent of GNP over 30 years.

This solution may not seem too daunting. Three decades may be ample time in which to make adjustments. During the last decade observers have witnessed about that much variation in the size of the deficit, though much of that variation was, of course, essentially unplanned. Nonetheless, a sustained reduction of government programs equal to 3 percent of GNP (with

no concomitant reduction in taxes) may be neither an easy nor a popular burden for the future generation of workers to bear.

The Bottom Line

With regard to the U.S. federal budget condition, the stage is set for some potentially positive developments over the next few decades. The primary budget (even without reference to seigniorage) is in surplus, and programmatic (on-budget, net-of-interest) expenditure has been declining, though not fast enough to keep pace with the rising debt service. Social Security will be providing a significant and growing chunk of GNP, which, though temporary, will help finance the on-budget deficit for the next several decades.

The Social Security surplus, though, is not a budget panacea. Only under a historically unprecedented set of circumstances would the OASDI trust fund be able to provide the incredible amounts of savings that some in the popular press have claimed.⁹

Nevertheless, the reforms that put the OASDI programs on an actuarially sound footing will provide some financial relief for the rest of the federal budget. This source of deficit reduction must not, however, be confused with making real progress toward shrinking the deficit. This point cannot be overemphasized. In particular, if economic performance produces an unexpectedly large surplus in the short run, the United States should resist the temptation to spend it: economic performance cannot be above-average forever. Thus, analysts concerned with the federal budget deficit should focus on the size and direction of the onbudget—as opposed to unified—deficit as the appropriate measure of fiscal budgetary control.

In a much broader view, however, not too much should be made of the Social Security surplus. The change in the effective national savings rate represented by this surplus would likely be occurring anyway because of the demographic composition of the population. That is, whether Social Security existed or not, the bulge in population would be saving for retirement. Somewhere in the world somebody

in the next generation will have to purchase the assets that this generation is acquiring, thus creating the same potential for budget deficits (as Social Security sells its assets), and trade deficits/capital inflows (as both OASDI and the private pension providers seek to find buyers abroad to purchase their accumulated assets) as exist today.

The most important moral to take away from this story is the need to focus on the on-budget

federal deficit. The natural surplus currently resulting from an actuarially fair Social Security program should not be taken as anything other than a lucky event, and real budgetary control should be measured excluding this temporary phenomenon. The Social Security surplus that will occur over the next few decades should not obscure the federal government's need for true fiscal reform.

Of Ricardian Equivalence, Social Security, and Red Herrings

The seventeenth century economist David Ricardo first proposed that all methods by which a government finances its expenditure are equivalent. That is, in a closed economy, which is self-contained and has no dealings with other economies, whether government spending is paid for by taxes or bond sales is of no consequence. Future generations inherit both the bonds from deficits and the taxes to retire the bonds. The two are of equal value, and thus, abstracting from possible redistribution of wealth problems, net to zero. I

One way of thinking about Ricardian equivalence is as follows: the current distribution of real resources and output is all that is relevant, not the method by which the distribution is financed; it is the amount of resources consumed by the government that is important, and the method by which the current consumption is financed only matters to the extent that it implies some future redistribution of wealth or income.

What does Ricardian equivalence have to do with Social Security? The Social Security system administers a series of claims on output by retirees. The money to pay these claims is built up over time by individuals' "savings"—the Social Security taxes paid by the individuals and their employers. This saving for retirement would, in some measure, be occurring with or without the Social Security Administration, but much retirement saving does occur through this mechanism.

Consider a simple overlapping generations example. Assume that everyone in the economy lives two periods. They work in the first period, retire in the second period, and consume in both. Since the older generation is not (by construction in this example) producing anything, the cohort must consume some of the younger generation's production. Usually this consumption occurs through the older generation's selling assets to the younger generation. The older generation accumulated these assets when they were young, in

anticipation of retirement, and the younger generation is willing to trade some of their current production for these assets so that they can repeat the process in the next period, when they retire.

This redistribution does not necessarily have to take place through the trading of assets for output. The government could simply enforce retirees' claims on current output. Current workers might go along with the redistribution plan, since everyone knows that this redistribution needs to occur, and eventually the younger generation, too, will be in a similar situation. Social Security, to meet these redistributional needs, accumulates assets as well, assets that will have to be sold to meet the needs of the future bulge in retirees, just like any other pension fund.

What matters in this example, as in real life, is the retired generation's claims on the current real output of the working generation, whether made by asset sales or enforced in some other way by the government. As long as each successive generation is larger or more productive than the previous one, these various transfer mechanisms will work fairly well. A problem may come, however, if one relatively large generation is followed by a relatively smaller one, where the transfer from workers to retirees may prove disproportionately large and relatively onerous.

The United States will face this precise problem over the next several decades. Each retiree is currently "supported" by about 3.3 workers. In the middle of the next century that ratio will decline to less than two. To maintain per capita real consumption, one of two situations must occur. Either labor productivity will have to rise substantially or some other economy whose population composition is opposite to the United States's situation will have to be willing to purchase the U.S.-accumulated financial assets so that some potential substantial redistributional burdens can be avoided.

Note

Government bonds thus do not represent net wealth, as the present value of the bonds equals the present value of the taxes necessary to retire the bonds. This point is made in the well-received article by Robert

Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82 (November/December 1974): 1095-1117.

Notes

¹See, for example, Cunningham (1986) and especially Cunningham and Cunningham (1986).

²For example, see "What Do We Do With All This Money?" (1988) or "That Bizarre Social Security Surplus" (1988).

³Sprague (1988) and Board of Trustees of the Federal Old-Age and Survivors Insurance and the Federal Disability Insurance Trust Funds (1988).

⁴Interest payments complicate this story in terms of government borrowing. A good discussion of the on-budget to off-budget income transfer accounting problem can be found in U.S. Congress (1989): 48-49.

⁵Actually, the unified net-of-interest deficit is the measure of particular interest for questions of stability and sustainability of a particular fiscal policy regime. For a detailed discussion of this idea, see Cunningham (1986). Also see note 7.

⁶Unlimited growth of this ratio is not sustainable for the simple reason that an infinite amount of debt cannot be purchased. That is, the amount of debt to be sold cannot

become continuously greater than the amount of income that is available to purchase it.

⁷This point is made explicit by Darby (1984). The steady-state debt to income ratio (ignoring seigniorage) is $D = (G - T) / (\gamma - r)$, where D is the steady-state debt to income ratio, G is the ratio of government spending to income without consideration of net interest, T is the tax to income ratio, γ is the real rate of economic growth, and r is the real after-tax rate of interest. In the standard story of a primary budget deficit (G - T > 0), stability depends upon γ 's being greater than r. If, however G - T is negative—a primary budget surplus—D can still be defined, but now with the less restrictive condition of r greater than γ . (If $\gamma > r$ and T > G, then the government will accumulate assets without bound.)

⁸Chart 3 is based on the January 1989 estimate made in U.S. Congress (1989).

⁹See note 2.

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Capital Requirements for Banks:

A Look at the 1981 and 1988 Standards

Larry D. Wall

Recent developments in the thrift industry and its insurer, the Federal Savings and Loan Insurance Corporation, have made Americans painfully aware of how quickly and massively troubles in financial institutions can mount. One implication of the current problems is that reforms need to be made in the supervision and regulation of federally insured depository institutions to reduce the probability that taxpayers will be asked again to share the burden of returning a federal insurance agency to solvency.

Among the alternatives being proposed is that federally insured depositories, especially thrifts, should be subject to stricter capital regulations. Higher capital standards may reduce the risk to the deposit insurance agencies by giving owners of banks and savings and loan institutions additional incentives to monitor risk and by providing a cushion to absorb losses. However, before capital regulation is accepted outright as a critical element of future reforms, the bank capital standards instituted during the 1980s deserve careful analysis because of the importance of adopting appropriate policies to limit the risk of government deposit insurance agencies.

This article reviews the bank capital standards that were adopted in late 1981. Among the issues considered are the reasons the

regulations were strengthened at that time, the decision to tighten capital requirements rather than some other regulations, and the effect of the standards on the banking system. The article also discusses the bank regulators' sweeping modifications in 1988 to the capital requirements and considers some of the issues raised by the new risk-based capital standards.

The overall framework for the analysis is provided by the regulatory dialectic model, which maintains that market forces will attempt to avoid binding regulation and that the government will respond by trying to shore up apparent regulatory weaknesses. The advantage of this model is that it explicitly considers the development of regulation through time and, thus, provides a framework for studying both the 1981 guidelines and the recent changes.¹

Regulatory Dialectic Theory

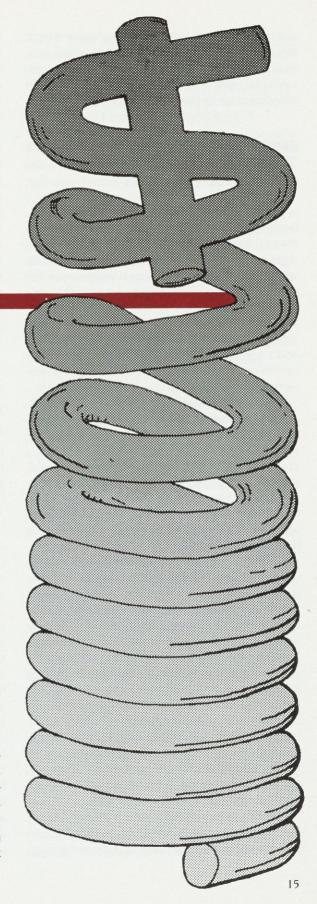
Edward J. Kane (1977) developed regulatory dialectic theory to analyze the interaction of economic and political power, with a particular emphasis on the selective allocation of credit.² According to this theory, regulation in economic markets does not universally satisfy the desires of some agents, and so some control from political markets is sought. The political process in such cases responds to those entities demanding regulation.

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One theory of governmental action maintains that regulations are often made interactively: as people try to avoid restrictions on their behavior, the authorities extend regulation. In this context, an Atlanta Fed senior economist reviews capital standards for banks. The effectiveness of these requirements is considered through a review of the research to date; the author also addresses some issues raised by the recently adopted risk-based capital standards.

In Kane's view, the problem with binding regulations is that, by definition, they prevent individuals and firms from acting in their own self-interest. Enormous rewards may be available to those who are willing to ignore the regulations, such as people who stayed in the alcohol business during Prohibition or people currently involved in the illegal drug trade. Substantial monetary compensation is also available to people who can develop ways to meet the technical requirements of the regulations while subverting their intentions. An example of such contravention is the development of moneymarket mutual funds in response to limits on deposit interest rates. The private sector's ability to undercut regulatory controls grows over time as more and better methods are developed and knowledge of them spreads throughout the economy. This evasion and avoidance activity not only hinders the effectiveness of a regulatory framework but also creates unintended and undesirable distortions.

The political system responds to the side-stepping of regulations by extending them, Kane believes. However, he suggests that enforcement of the regulations' original intent lags behind attempts to circumvent the standards, unless very strong community support exists for them. According to this researcher, private-sector participants with a personal stake in their actions tend to "outclass, outnumber and outwork" those with a limited personal interest, such as people in the public sector. The result, in Kane's opinion, is that "Customarily a network"



FEDERAL RESERVE BANK OF ATLANTA

of controls continues to expand unless and until the budgetary cost, social inconvenience, economic waste, and distributional inequity associated with the system become painfully obvious even to the ordinary citizen."

The Situation before the 1981 Capital Guidelines

Kane's analysis clearly points out that regulations arise because of some political demands, that is, because the market by itself does not impose significant enough restrictions on certain activity. Thus, any discussion of the 1981 guidelines, which are the focus of this article, must consider why the regulations were adopted. The two important issues here are: (1) why was bank regulation tightened in 1981, and (2) why did regulators use capital requirements rather than some other means of stricter regulation?

The Need for Tighter Regulations. The modern era of external controls on U.S. bank activities began in the 1930s. Institutional failures, accompanied by widespread bank runs, increased early in that decade. Moreover, the real, that is, nonfinancial, economy went into a severe economic downturn. In 1933 Congress took several actions to reduce the risk of bank runs and possibly also the threat of bank failures. The legislature's principal action was to create deposit insurance, which both eliminated the incentive of small depositors to engage in bank runs and extended the reach of federal bank regulators. Prior to 1933 state-chartered banks were subject to federal regulation only if they voluntarily chose to join the Federal Reserve System. The provision of federal deposit insurance was contingent on the acceptance of federal regulation, and so many banks not federally regulated prior to 1933 voluntarily accepted federal regulation to obtain deposit insurance and thus remain competitive. At the same time, competition in the banking industry was curbed through both controls on the interest rates payable on deposits and restrictions on the formation of new institutions.

Deposit insurance also gave banks an incentive to increase their risk. Before 1933 depositors monitored the riskiness of their own banks.

If an institution increased its exposure, depositors could either demand a higher rate of return or withdraw their funds. After deposit insurance measures were put in place, many depositors lost interest in how risky their bank's activities were. Moreover, deposit insurance premiums are not actuarially based; that is, they ignore the bank's level of risk. Instead, the payments are based on a fixed percentage of the firm's deposits. In effect, banks could gamble in hopes of providing their shareholders with a large return on their investments, but the government would bear most of the losses if the bank had to close as a result of its risks. However, the impetus to take greater chances with bank assets was lessened by the increased incentive to own a bank charter and thus be able to reap the profits from banking activities. For several decades, the re-

"Bank failure rates fell sharply after the creation of federal deposit insurance.... Firms' capital was supervised during this period, but no formal numerical standards were in effect during the 1970s."

strictions on competition were effective enough to ensure a bank's profitability unless its management was either incompetent or corrupt.

The Modern Era. Bank failure rates fell sharply after the creation of federal deposit insurance, and they remained at very low levels into the 1970s. Firms' capital was supervised during this period, but no formal numerical standards were in effect during the 1970s. Instead of having regulations or levels that applied across the board to a group of banks, regulators assessed capital ratios on a case-by-case basis. A potential advantage of the bank-by-bank approach of the 1970s was that supervisors could consider factors such as management quality that are not easily incorporated into numerical guidelines. In practice, however, the lack of a single standard created problems. Though supervisors could keep any individual bank from having a

capital level below that of its peers, in the 1970s large banks as a group began to experience declining capital ratios, according to Alan J. Marcus (1983). These declines eventually led to the 1981 regulations.

During the late 1970s the economic environment changed in several ways, compounding the problems that regulators faced. High inflation and high interest rates raised the costs of regulating the returns paid on deposits. Technological advances lowered the costs of developing substitutes for bank deposits, such as investing in money-market mutual funds. The combined effect of high rates and technological advances was a sharp increase in the number of nonbanks that supplied banklike services.³ Moreover, high rates of inflation induced many firms to gamble that prices would chart a similar

"The risk of bank failure increased in the early 1980s as disinflationary policies, which threatened the outcome of investments made in the previous decade, were successfully implemented."

course in the future. A large number of banks expanded their lending to energy and agricultural interests on the assumption of rising commodity prices. Some large banks also broadened their portfolios to include more loans to Latin American countries, based on an expectation of continuing inflation and low real interest rates. Because of later shifts in the economic environment, after the end of the 1970s banks and thrifts experienced increased competition and became more vulnerable to disinflationary policies.

Strategies to reduce inflation were devised in the early 1980s, resulting in a temporary spike in interest rates that prompted further attempts to innovate around the maximum rates payable on deposits. These new instruments were so successful that Congress passed the Depository Institutions Deregulation and Monetary Control

Act of 1980, which phased out most deposit interest-rate ceilings and promised increased competition within the banking industry. Lower U.S. inflation also made riskier the loans extended to energy and agricultural producers and to many Latin American debtors.

The risk of bank failure increased in the early 1980s as disinflationary policies, which threatened the outcome of investments made in the previous decade, were successfully implemented. The incentive to avoid risks was also undermined as increased competition eroded the profitability of owning a bank. For regulators to meet the mandate to prevent or limit bank failures, which grew from public concern about failures and their cost to deposit insurers, some regulatory action was necessary.

The Choice of Capital Guidelines

Bank regulators can use a variety of tools to reduce risk and potential losses to the deposit insurance fund. Their choice of numerical capital ratios is more easily understood by considering the available alternatives for reducing the number and impact of bank failures.

Risk-shifting. Regulators could have attempted to shift most of the risk of bank failure to the private sector. This strategy's effect would have been to reduce the incentive for banks to take risks since private interests would resist absorbing losses. One way to accomplish this realignment of exposure would have been to increase the amount of subordinated debt banks would be required to hold. Subordinated debt, like equity, provides a cushion to absorb losses, thereby reducing claims against the deposit insurer should a bank fail. Closing troubled banks before the market value of their equity capital became negative would have been another solution.

The problem with this tactic is its inconsistency with the political incentive to avoid bank failures. If risk-shifting is to increase market discipline, investors must suffer losses when banks fail. The potential for loss provides the impetus to monitor firms' activities. Thus, the dissolution of some banks is an essential element of a successful shifting of risk.⁴ However, Kane (1985) suggests that political pressure "focuses on the

hardships that individual (bank) failures threaten to impose on individual members of society and on the danger that a failure might initiate a sequence of systemwide collapse." In particular he notes that bank regulators do not typically want to chance a collapse similar to that which occurred in the 1930s, especially since surviving banks and the taxpayers bear the costs. The concern about the demise of large banks is particularly significant since their success or failure is thought to have a greater impact on the banking system's stability than the failure of small banks.

Risk-based Premiums. A second alternative for decreasing bank risk is to charge insurance premiums that fully and accurately reflect each bank's risk exposure. Though eliminating the incentive to take more risk than would be taken in the absence of deposit insurance, this course would require congressional action. Another problem is that measuring a bank's riskiness is difficult, a fact which could lead to some significant errors in premium assessment. A third drawback is that risk-based insurance premiums would require very high assessments for problem institutions, further increasing their probability of failure. Thus, the notion of riskbased insurance premiums, like risk-shifting, is inconsistent with the political incentives facing regulators, which are intended to keep banks healthy and operating.

Regulatory Fiat. If price mechanisms are insufficient in motivating banks to take less risk, regulatory fiat might be appropriate. For example, regulators could seek to have laws enacted that would preclude banks from investing in excessively risky assets. Prior to 1981 limitations on the nature of an institution's assets were in place. but regulators could have tried to strengthen these restrictions. One problem with limiting bank exposure through regulatory controls on assets is that of specifying exactly which investments are excessively risk-laden. An asset's riskiness must also be gauged in the context of the bank's entire asset portfolio. An investment that appears questionable in its own right may actually reduce a bank's overall risk by providing diversification. A second problem with trying to restrict existing bank assets is that some bank customers are probably going to lose a few bank services and are likely to use political pressure to overturn regulatory judgments.

Capital Requirements. A fourth alternative in the attempt to reduce risk is raising capital requirements. Banks may object that higher capital requirements raise operating costs, but any increase in costs is typically distributed such that no single group of customers has a strong incentive to object. An important advantage of higher capital standards is that they can keep problem banks from failing. The capital that a bank raises to meet increased standards may provide enough resources for the bank to survive a devaluing of its bad assets. Though regulators may face problems determining the optimal amount of bank capital, the risk of failure is inversely related to the level of capital if other factors are held constant; that is, the more capital a bank holds, the less likely it is

As one can see, regulators could have chosen from a variety of alternatives to respond to the call for increased regulation. All of the alternatives had drawbacks, but increased capital requirements appeared to be the optimal regulatory action, given their incentive structure.

Banks' Response to the 1981 Regulations

In December 1981 the Federal Reserve and the Office of the Comptroller of the Currency (OCC) announced a common set of standards that would apply to all member banks and all bank holding companies. In that year as well, the FDIC announced a somewhat different set of regulations for all insured, nonmember banks, and in 1985 the FDIC adopted capital regulations identical to the Fed's and the OCC's. (The initial regulations and subsequent modifications are reviewed in the box on page 19.)

Although capital regulations became stricter in 1981, they were not necessarily the only reason for changes in the industry's capital levels. At this time, the market may also have recognized the increase in risk that had taken place and demanded higher capital levels. If increases in bank capital were due to market rather than regulatory pressures, Kane's regulatory dialectic theory would not necessarily apply. Moreover, even if the new standards were

The 1981 Guidelines and Revisions

The Federal Reserve and the Office of the Comptroller of the Currency (OCC) developed numerical capital guidelines in 1981. Two types of capital were defined: (1) primary capital, which consists of common stock, perpetual preferred stock, capital surplus, undivided profits, reserves for contingencies and other capital reserves, mandatory convertible instruments, and an allowance for possible loan losses; and (2) total capital, which is primary capital plus limited-life preferred stock and qualifying subordinated notes and debentures of the bank subsidiaries. Banks are split into three categories: multinational organizations as designated by their respective supervisory agency (in practice, the 17 largest banking organizations), regional organizations (all other banks with total assets in excess of \$1 billion), and community banks that have total assets under \$1 billion.

No numerical standards were set in 1981 for the multinational organizations, but regulators stated their clear expectation that these firms would improve their capital positions. The guidelines suggested that the minimum primary-capital-tototal-asset ratio for regional banking organizations is 5 percent, and the minimum for community banks is 6 percent. The guidelines also stated that both regional and community institutions are generally expected to exceed these minimums. A 'zone approach" was used for total capital ratios. Banking organizations were presumed to have adequate total capital if their capital ratios fell into zone 1, which for a regional bank meant maintaining total capital of at least 6.5 percent of assets and for community banks meant maintaining a ratio of at least 7 percent.

The FDIC established a minimum equity-capital-to-assets ratio of 5 percent in 1981. In May 1982 the Fed and the OCC announced their criteria for assessing mandatory convertible debt issues. The regulators provided several conditions that must be satisfied before this type of security would count as primary capital. Among these conditions are that:

- the security must mature in 12 years or less;
- the aggregate amount of the mandatory convertibles may not exceed 20 percent of all other types of primary capital;
- the issuer may redeem the securities prior to maturity only with proceeds from selling common or perpetual preferred stock;

- the holder may not accelerate payment except in the event of bankruptcy, insolvency, or reorganization; and
- the security must be subordinated in right of payment to all senior debt.

The regulators also noted that two types of mandatory convertible securities had been issued: those mandating conversion of the debt to common or perpetual preferred equity (called *equity notes*) and those that merely obligate the issuer to sell stock in a sufficient amount to fund the repayment of the debt (called *equity commitment notes*). The regulation imposed additional restrictions on both types of mandatory convertible securities.

In June 1983 OCC and Fed regulators revised the guidelines for multinational organizations. They were also required to meet the 5 percent minimum primary-capital-to-total-asset ratio. The regulators also decided to include unsecured, long-term debt of the parent company and its non-bank subsidiaries in the capital adequacy ratio of the consolidated bank holding company.

The FDIC, in March 1985, adopted the same capital adequacy standards as the other two agencies. The FDIC and OCC also announced several changes in their regulations:

- a uniform 5.5 percent primary-capital-to-totalasset ratio was required of all banking organizations, regardless of their size;
- all intangible assets except purchased mortgage servicing rights should be deducted from capital;
- equity commitment notes were no longer included as an element of primary capital;
- secondary capital could include only subordinated notes and debentures, and limited life preferred stock up to 50 percent of primary capital; and
- capital ratios should be calculated using average total assets rather than period-end total assets.

In April 1985 the Federal Reserve approved the FDIC and OCC guidelines for member banks while deciding not to impose the exact same guidelines on bank holding companies. Among the changes for bank holding companies were: (1) the Board adopted a case-by-case approach to reviewing

intangible assets, though the regulations note that intangible assets in excess of 25 percent of primary capital will receive special attention; (2) equity commitment notes remained an element of primary capital subject to certain conditions; and (3) bank holding companies are allowed to use end-of-period rather than average total assets.

The Federal Reserve Board in November 1986 approved perpetual debt that satisfies certain criteria as an element of primary capital. The Board also restricted the sum of perpetual preferred stock, mandatory convertible debt, and perpetual debt to one-third of gross primary capital, that is, primary capital before subtracting out intangibles.

directly responsible for the changes and binding on the banks, attempts to avoid the regulators' risk-reduction intentions may not have occurred for one of two reasons: Kane's theory could be incorrect, or the costs of avoiding the regulations may have exceeded the gains (at least for those methods of avoidance available during the 1980s).

Did the 1981 Capital Standards Result in Higher Capital Ratios? The capital ratios of uninsured corporations may depend on a variety of factors.5 The double taxation of dividend income-levied first on corporate income and then on individuals who receive dividend payments—may tend to reduce optimal capital ratios, as would the costs of financial distress. Agency costs-which reflect inefficient policies adopted by managers to benefit themselves at the expense of owners and creditors, or policies that benefit owners at the expense of creditors arise from both the use of debt and equity. Higher equity levels encourage managers to adopt inefficient policies since more equity reduces the risk of failure (and, hence, of managers' loss of jobs). Higher debt levels encourage shareholders to demand inefficient policies since creditors will bear more of the costs. Thus, models that include agency costs tend to show that the optimal capital structure includes both debt and equity.

Banks' capital ratios may depend on factors that influence other corporations as well as those unique to banking organizations. Deposit insurance, for example, may have a significant impact on bank capital structures by deflating shareholder-value-maximizing capital ratios, according to a variety of studies (Robert A. Taggart, Jr., and Stuart I. Greenbaum [1978], John H. Kareken and Neil Wallace [1978], and William F. Sharpe [1978]). Yair E. Orgler and Taggart (1983) develop a model of banking organizations' capital that considers taxes, (eventual)

diseconomies of scale in producing deposit services, bankruptcy costs, and deposit insurance. They conclude that deposit insurance lowers the market-value-maximizing capital levels but that optimal ratios are not reduced to zero.

Capital regulation is another potentially important determinant of capital ratios. These regulations are important if they are binding, that is, if they result in higher capital ratios than would exist without capital standards. Whether the regulations are binding is an empirical question that may not be answered solely by theoretical analysis.

Several researchers have investigated the effectiveness of capital regulation prior to institution of the 1981 capital standards. Among them, J. Kimball Dietrich and Christopher James (1983) conclude that those regulations on banks were ineffective. Marcus comes to the same conclusion about the effect of capital regulations on bank holding companies. However, these studies' sample periods predate the 1981 numerical capital standards and thus may not apply to the regulatory regime after 1981. Also, the lack of explicit numerical guidelines meant that these studies necessarily had less precise measures of regulatory standards than were available after the 1981 regulations took effect.

The need for the 1981 guidelines may be questioned on the grounds that the market by itself placed a higher value on banks with stronger capital ratios. Dilip K. Shome, Stephen D. Smith, and Arnold A. Heggestad (1986) find that the market value of 99 bank holding companies was a positive function of their bookequity-to-total-asset ratio over the 1978-82 period.

Michael C. Keeley's (1988a) analysis, in contrast, suggests that the capital regulations were effective. He first shows that, for his sample of 103 of the largest U.S. banking organizations, average primary-capital-to-asset ratios increased

after 1982. The researcher then divides his sample into 24 capital-deficient banks and 79 capital-sufficient banks. (Sufficiency is defined as meeting the 1985 capital standards at the end of 1981.) Keeley shows that the capital-deficient banks increased their capital ratios over the 1982-86 period and that almost all capitaldeficient banks met the standards by the end of that time. He further demonstrates that capital ratios at capital-deficient banks rose even if standby letters of credit are included in the asset base or if the capital-to-asset ratio is measured in market-value terms. (A standby letter of credit is an agreement by a bank to pay another party if the bank's customer defaults on an obligation.) However, Keeley notes that the market-value capital ratios of capital-sufficient banks also rose during this period and, after some additional analysis, concludes that the market-value evidence is consistent with several hypotheses in addition to that of regulatory effectiveness.

Studies that focus solely on either market pressure for higher capital ratios or regulatory pressures have limited power to address whether the regulatory standards were binding after 1981. The problem is that regulators are most likely to identify as undercapitalized many of the same banks that the market also identifies as most undercapitalized. Thus, finding that a group of capital-deficient banks, by either criteria, increased their capital is consistent both with binding and nonbinding regulations. The only way to determine whether the capital regulations themselves are binding is to specify a regulatory model of capital changes and a market model of capital changes. Empirical analysis should then determine the model that has more explanatory power.

Constructs of both regulatory and market capital determination are specified and estimated in studies by the author and David R. Peterson (1987, 1988) for 105 large bank holding companies and 89 of their lead banks. Separate analyses of lead banks and bank holding companies are conducted because the factors influencing capital are different for each type of organization. For example, a bank holding company's consolidated capital ratio influences the firm's tax liability, whereas the capital ratio of a lead bank does not necessarily affect the bank holding company's consolidated tax returns.

Both Wall and Peterson studies assume that either the regulatory model or the market model is binding for any individual banking organization, but which model is binding for any given organization may not be determined before empirical analysis.⁷ The regulatory and market models in Wall and Peterson (1987) both specify that changes in a bank holding company's capital ratio are a function of the discrepancy between the optimal capital ratio and existing capital ratio. The optimal capital ratio in the regulatory model reflects the influence of regulatory guidelines plus some capital cushion. This padding may exist in response to regulators' expectations or because of bank holding companies' desire to have the extra flexibility that additional capital affords.

The optimal capital ratio in the market model is roughly based on the market factors in Orgler and Taggart, who, as mentioned earlier, include taxes, bankruptcy costs, and deposit insurance. Unfortunately, not all of these market factors can be observed directly. Thus, Wall and Peterson developed a set of observed variables to proxy for unobservable factors. The weakness in using proxies, though, which is shared by many empirical economic studies (including Dietrich and James's as well as Marcus's), is that the results are contingent on picking the correct proxies.

The results of the bank holding company study suggest that the capital regulations were binding for most organizations. With a probability of at least 70 percent, the percentage of bank holding companies best explained by the regulatory model is 84 percent in 1982, 81 percent in 1983, and 58 percent in 1984.

Wall and Peterson's lead bank model is similar to the bank holding company model, except that the former contains proxy variables for the riskiness of the bank holding companies. That is, the market's perception of a bank's riskiness may depend in part on whether the lead bank is expected to be a source of strength to the bank holding company or vice versa. This study's results are roughly comparable with the bank holding company investigation in that the regulatory regime appears to be dominant in both. With a probability of at least 70 percent, the percentage of lead banks in the regulatory regime is 38 percent in 1982, 87 percent in 1983, and 88 percent in 1984.

Thus, empirical analysis indicates that the 1981 numerical guidelines were binding on at least some of the banks, suggesting that the capital regulations may be imposing costs on bank holding companies. Wall and Pamela P. Peterson (1988) found supporting evidence for increased costs by examining new security issues that qualify as an element of bank holding companies' regulatory capital during the 1982-86 period. Their study concludes that binding capital regulations may cause banking organizations to underinvest or may increase their agency costs or both.

Did Banks Avoid the Goals of Capital Regulation? If the 1981 regulatory capital requirements are binding and imposing significant costs on banks, the firms may institute innovations that would work around the intent of the regulations. Yehuda Kahane (1977) and Michael Koehn and Anthony M. Santomero (1980), for example, show that binding capital regulation may induce banks to assume additional risk.

Chun H. Lam and Andrew H. Chen (1985) find that banks' response to binding capital regulations may depend on whether limitations affect the rates paid on deposits. If deposit-rate ceilings are binding, the effect of capital regulation on bank risk is ambiguous. If deposit ceilings are not binding, response to capital regulations may depend on a bank's initial capital position, with some organizations becoming less risky and others becoming riskier.

Daesik Kim and Santomero (1988) establish that using theoretically correct risk weights to calculate capital levels may limit banking organizations' exposure but that these weights will also alter portfolio compositions. An important element in all of these studies is that none proves that banks' probability of default will increase upon imposition of capital standards. Rather, the research suggests that at least some banks may increase the riskiness of their asset portfolio, and, further, that in some cases the increase in asset risk may more than offset the additional capital. Though an increase in the probability of default may result from increased asset risk, such an effect is by no means automatic.

Frederick T. Furlong and Keeley (1987a, b) dispute prior theoretical findings that capital regulation may lead to increased asset risk. The researchers suggest that capital regulation un-

ambiguously reduces the incentives for banks to make their asset portfolios riskier. In their model, capital regulation will limit the possibility of bank failure as long as regulators do not relax their restrictions regarding the riskiness of asset portfolios. Keeley and Furlong (1987) reconcile their results with those of prior models by proclaiming that earlier constructs are internally inconsistent: they ignore default risk to evaluate the effect of regulation on the probability of default. Specifically, prior models assume that the cost of deposits is independent of the bank's risk, ignoring the fact that the deposit insurance agency bears the cost of deposits if the institution fails.

A possible weakness with Furlong and Keeley's results is their implicit assumption that banking organizations are always taking the maximum

"If the 1981 regulatory capital requirements are binding and imposing significant costs on banks, the firms may institute innovations that would work around the intent of the regulations."

risks permitted by regulation. This implicit assumption may not be valid. For example, some banks, especially the large banking organizations most affected by capital regulation, make substantial investments in long-term assets and try to maintain good customer relations over time. Neither of these actions truly corresponds to taking the maximum risk permitted by regulators. Bank managers stand to lose their jobs if their firm fails and thus have an incentive to avoid excessive exposure. Moreover, as a practical matter bank regulators are not necessarily aware of nor can they control all of the risks that banking organizations take.8 If most banks are taking less risk than regulators permit, Furlong and Keeley's models might be incomplete, calling for more theoretical analysis of this issue.

Furlong (1988) empirically analyzes changes in banking organizations' risk-taking in order to

evaluate the effect of the 1981 capital regulations on banks' risk exposure. He divides his sample, which consists of 98 large banking organizations that are on the Compustat Bank data tapes from 1975 to 1986, into 24 bank holding companies that failed to meet the 1985 standards in 1981 and 74 bank holding companies (referred to here as "other bank holding companies") that met these requirements. By showing that the proportion of low-risk, liquid assets fell between 1981 and 1986, his study indicates that banks may be taking on more risk. However, he notes that this decline began before 1981.

Another indication of heightened risk comes from James (1987), who finds that standby letters of credit grew faster than commercial loans over most of the period since 1981. This finding is

"[T]he suggestion from several theoretical studies that capital regulation could have an adverse effect on banking organizations' risk of failure is not supported. Unfortunately, a stronger interpretation of the result hinges on changes in the tightness of regulatory control, which may not be easy to estimate."

significant because standby letters of credit are an off-balance sheet item and hence did not affect banking organizations' capital requirements under the 1981 guidelines.

The main part of Furlong's analysis focuses on several comprehensive measures of banking organizations' exposure. He finds that asset risk, as measured by estimated standard deviations of the assets' rates of return, grew from 1981 to 1986 for both capital-deficient bank holding companies and other bank holding companies, and by virtually the same amount. Furlong then investigates a measure of the risk of failure that considers the levels of expected return, variability of return, and capital. This indicator suggests that the risk of default increased significantly for the entire sample and for the other bank holding companies. The measure also showed additional risk for the capital-deficient

bank holding companies, though the rise from 1981 to 1986 was statistically insignificant. A third measure of risk is an estimated value of deposit insurance per dollar of deposits. The value of deposit insurance increased significantly for the entire sample. Both subsamples showed upward movements, but they were statistically insignificant.

Furlong interprets his results as being consistent with a relaxation of regulatory controls on bank asset risk. If the regulators did loosen their controls, Furlong's results could even be interpreted as supporting his and Keeley's (1987a, b) theoretical analysis. The capital-deficient institutions tend to be the very large banks that are disproportionately involved in loans to troubled Latin American and other borrowers. Most of these lending agreements were made by the end of 1981, and large banks in general had not been able to reduce their exposure substantially by 1986. Moreover, these loans appeared far riskier by 1986 than they did in 1981. Thus, the capital-deficient bank holding companies experienced an involuntary upswing in asset risk between 1981 and 1986 that is probably not matched by a similar involuntary rise for other bank holding companies. If this involuntary increase in risk could be deducted from the total added risk, Furlong's results might support his and Keeley's conclusions about desired risk exposure.

An alternative explanation of Furlong's results is that the capital regulations did not influence bank holding companies' risk of failure or the expected cost to the deposit insurance agency. In this interpretation bank holding companies' asset exposure was not constrained by binding regulation in 1981 or 1986, at least not for the 98 organizations in his sample. If this interpretation is correct, Furlong and Keeley's models are misspecified.

The only conclusive finding from Furlong's results is that the riskiness of the capital-deficient bank holding companies did not increase relative to other bank holding companies. Thus, the suggestion from several theoretical studies that capital regulation could have an adverse effect on banking organizations' risk of failure is not supported. Unfortunately, a stronger interpretation of the result hinges on changes in the tightness of regulatory control, which may not be easy to estimate.

Risk-based Capital Standards

By the mid-1980s bank regulators had become aware of the fall in low-risk, liquid assets discussed by Furlong as well as the increase in off-balance sheet activities noted by James. Both developments suggested that banks may be finding ways of avoiding the 1981 standards by increasing their proportion of both higher risk and return assets and off-balance sheet risks. Regulators' concerns over these changes led to new guidelines that heightened the incentive to hold low-risk, highly liquid assets and lowered the motivation to engage in off-balance sheet activities.

The Federal Reserve proposed risk-based capital guidelines in January 1986. However, this proposal was not entirely satisfactory because it applied only to domestic banking institutions. Foreign banks could, and often did, maintain capital ratios far below those expected of U.S. banks, especially when measured in book-value terms. The disparity between foreign and domestic banks' capital ratios gave the appearance that U.S. capital regulations handicapped the nation's institutions in international competition. Thus, U.S. regulators sought, with considerable success, an international agreement. A joint proposal with the Bank of England was issued in January 1987. In July 1988 an agreement was reached by the central banks and bank regulators of Switzerland, Luxembourg, and the Group of Ten (Belgium, Canada, France, West Germany, Italy, Japan, the Netherlands, Sweden. the United Kingdom, and the United States). This proposal provides the general outline of risk-based capital standards but allows each country some options in implementing the regulations. The agreement is reviewed in the box on page 25.

The effect of these regulations on banks depends in part on whether the standards are binding. If they are not binding on any organizations, bank failure rates or losses to the FDIC will not be affected. However, the regulations should be expected to bind at least some organizations. For cases in which the regulations are binding, the regulatory dialectic theory would imply that banks will try innovating around the regulations. Indeed, Barbara A. Rehm (1988) suggests that banking organizations may attempt

to avoid the requirements by having assets assigned to lower risk categories. She quotes an unnamed FDIC official as stating: "The mind of Wall Street to invent new instruments is unlimited.... We have to make the guidelines detailed enough so that placing assets will not be difficult." Banks may also try to skirt the regulations by limiting investments in assets with high regulatory capital requirements relative to market capital requirements and investing more in assets with relatively low regulatory capital requirements.

If the standards are binding, a second question also becomes important: do the regulations require more or less capital than the market would require in the absence of deposit insurance (but with all other existing regulations)? If the regulations require less capital, deposit insurance is still subsidizing bank risk-taking. Moreover, more banks will likely fail than would have been the case with higher standards.

Alternatively, the capital regulations may demand more capital than the market would absent deposit insurance. This requirement could achieve the political goals of reduced failure rates and lower deposit insurance costs. However, excessive capital requirement may also place banks at a competitive disadvantage relative to nonbank financial services firms by imposing costs on banks that are not placed on nonbank competitors. This cost would exceed any subsidy obtained from deposit insurance. Joanna Pitman (1988) discusses commercial banks' concerns that the capital requirements imposed on interest-rate and currency swaps may give investment banks and insurance companies a competitive advantage. Moreover, to the extent that banks cannot innovate around the regulations and that nonbank firms are unable to enter banking markets (perhaps because banks may have some economies of scope or scale), bank customers will bear the higher costs of capital regulation.

A third possibility is that the regulatory capital requirements are roughly equal to that which the market would require absent deposit insurance. If this is the result, deposit insurance will not provide a subsidy to bank risk-taking nor will nonbank competitors have an advantage over commercial banks. It Even if a deliberate effort were made to match regulatory

The Proposed Risk-based Standards

The central banks of Luxembourg, Switzerland. and the Group of Ten countries agreed on a common approach to evaluating the capital adequacy of the international banks in their respective countries. The agreement focuses on the credit risk of banking organizations; other types of risk, such as interest-rate and foreign-exchange risk, are not explicitly considered. This framework provides a definition of capital for capital adequacy purposes, a scheme for risk-weighting banks' assets and off-balance sheet items, and target capital ratios. The agreement addresses most major issues but does leave some options to individual countries, including the establishment of higher standards and application of those standards to any banking organizations under their supervision. The U.S. bank regulators plan on extending the agreement to cover all banks and bank holding companies.

The international agreement is scheduled to take full effect in 1992. Transitional standards are provided with slightly more lenient accounting restrictions and somewhat lower capital ratio requirements. The discussion below focuses on the 1992 guidelines, as well as on the transitional capital ratio requirements.

The agreement generally provides for the use of book rather than market values, though the latter are used in some aspects of the guidelines. The agreement defines two types of capital: core (tier I) and supplementary (tier 2) capital. *Core capital* consists of common shareholders' equity (issued and fully paid), disclosed reserves (including retained earnings), and perpetual noncumulative preferred stock. I Goodwill, the excess of an acquisition's purchase price over its market value, is deducted from tier I capital.

Supplementary capital includes undisclosed reserves, 45 percent of revaluation reserves, general loan loss reserves, hybrid debt capital instruments, and subordinated debt. Undisclosed reserves are similar in nature to retained earnings but are not disclosed in the banks' financial statements. These reserves are common in several foreign countries but are not permitted by U.S. accounting standards.

Revaluation reserves reflect assets for which the market value substantially exceeds their historical costs, such as common stock that has appreciated in value since its purchase. Revaluation reserves are generally far more important in foreign countries, but some U.S. banks have significant un-

recognized gains because of good investment performance.

Loan loss reserves are included in supplementary capital only to the extent that they are not allocated to cover losses on specific assets. In any case, loan loss reserves in excess of 1.25 percentage points are excluded from supplementary capital. Hybrid debt capital instruments include perpetual debt and mandatory convertible debt.

Subordinated debt may not exceed 50 percent of supplementary capital. Investments in unconsolidated subsidiaries are deducted from a bank's total capital. Investments in other banks' capital

International Capital Guidelines

(to be adopted for 1992 by the Group of Ten countries, Luxembourg, and Switzerland)

Tier 2 Capital

(Supplementary Capital)

undisclosed reserves

- + 45 percent of revaluation reserves
- + general loan loss reserves (up to 1.25 percentage points)
- + hybrid debt capital instruments
- + subordinated debt (up to 50 percent of tier 2 capital)
- investments in unconsolidated subsidiaries
- investments in other banks' capital instruments
 (at supervisor's discretion)

Cannot exceed the total of tier 1 items

Tier 1 Capital (Core Capital)

common shareholders' equity (issued and fully paid)

- + disclosed reserves (including retained earnings)
- + perpetual noncumulative preferred stock
- goodwill

instruments may also be deducted at the discretion of the bank's supervisor. In calculating totals the maximum amount of tier 2 capital is limited to the total of tier 1 items.

On-balance sheet assets are assigned to various categories, and risk weightings are then applied to each category. Assets with virtually no credit risk are assigned a zero weight (that is, they require no capital). Items in this category include cash; balances and claims on the domestic central bank; loans to domestic central governments; securities issued by domestic central governments; and loans and other assets fully collateralized by cash or domestic government securities or fully guaranteed by domestic central governments.²

A 20 percent weight is assigned to assets with very limited credit risk, including claims on domestic and foreign banks with an original maturity under one year, claims on domestic banks with an original maturity greater than one year and loans guaranteed by domestic banks, claims on foreign central governments funded by local currency liabilities, and cash items in process of collection. The regulators may assign regional developmental banks to the 0 or 20 percent weight category. Loans to owner-occupiers for residential house purchases fully secured by a mortgage receive a 50 percent weight. A 0, 20, or 50 percent weight may be assigned to claims on the domestic public sector excluding the central government and loans guaranteed by such institutions.

Assets of normal credit risk are assigned a 100 percent weight. The assets in this category include claims on the private sector, cross-border claims on foreign banks with an original maturity greater than one year, claims on foreign central governments, claims on commercial companies owned by the public sector, fixed assets, real estate and other investments, capital instruments issued by other banks (unless deducted from capital), and all other assets.

Off-balance sheet items are first converted into credit-risk equivalent values based on the type of

instrument. The equivalent values for off-balance sheet items are then multiplied by the weights applicable to the counterparty for an on-balance sheet transaction. A credit conversion factor of 100 percent is applied to direct credit substitutes (for example, financial standby letters of credit and endorsements), sale and repurchase agreements, asset sales with recourse, and forward purchases. A 50 percent conversion factor is applied to transaction-related contingent items such as performance bonds, bid bonds, and warranties. A 50 percent weight is also applied to note issuance facilities, revolving underwriting facilities, and other commitments with an original maturity exceeding one year. Similar commitments with an original maturity under one year or which can be unconditionally canceled at any time carry zero weight. Short-term, self-liquidating, trade-related contingencies carry a 20 percent weight.

The regulators of each country are given an option in determining the conversion factor for offbalance sheet items where the credit exposure is contingent on foreign exchange rates or interest rates. To account for potential increases in credit exposure, one option is that the credit risk will be assessed as the total replacement cost (markedto-market value) of all contracts with a positive value plus a percentage of the notional principal of all transactions. The other option is to apply a straight percentage to the original notional principal without any adjustments for market value. The conversion percentages under this approach are higher than those required when banks are mandated to include the replacement cost in their risk-weighted asset base.

By the end of 1990 banks are required to achieve a total, risk-weighted capital ratio of 7.25 percent. Banks should also have a minimum core capital element of 3.6 percent, which may include some supplementary elements and a minimum tier I capital ratio of 3.25 percent. At the end of 1992 the minimum standard is 8 percent, of which tier I capital must be at least half.

Notes

¹The Federal Reserve includes perpetual cumulative preferred stock as an element of tier I capital for bank holding companies. The rationale for this action is that the Federal Reserve is not required by the agreement to impose the risk-based standards on bank holding

companies and therefore may exercise this option to slightly weaken the guidelines for them.

²Bank regulators in each country may, at their discretion, impose a 10 or 20 percent weight on assets whose value may fluctuate due to interest rate changes.

requirements to market requirements, this outcome would be difficult to achieve. No such effort appears to have been made.

Neil Osborn and Garry Evans (1988) interviewed various market participants about risk-based capital guidelines and reached several conclusions:

- the guidelines will handicap U.S. banks relative to foreign banks,
- the development of interstate banking in this country will be slowed by the deduction of goodwill (the excess of an asset's purchase price over its market value) from the capital ratios.
- banks will not raise their prices because of competition from securities firms and other nonbank institutions.
- banks will take additional risks to maintain their return on equity, and
- the standards are likely to become "more and more detailed over the next few years" (see the box on page 25) and may cause banks to focus on regulations rather than on customers.

Whether these conclusions are correct will be demonstrated over time. In any case, Osborn and Evans raise several interesting issues about the risk-based guidelines.

The two researchers focus on the international competitive effect of the regulations, asserting that they give the Japanese a "large new weapon with which to cudgel their American" competitors. This comment implies that capital regulation should be viewed primarily in the context of its effect on worldwide competition. The problem with their policy recommendation, which implicitly suggests that standards be relaxed, is that it is based solely on their analysis of banks' ability to meet their capital guidelines. Instead, the focus of their study should be on where the standards lie relative to what a market would require without deposit insurance. If the standards are tighter than the market would demand on its own, a good case can be made for revisions, regardless of the regulations' impact on the international competitiveness of U.S. banks. However, if the standards are not tighter, Osborn and Evans' implied criticism is questionable. A decision to set lower capital standards to promote U.S. banks' competitive position would in effect have the regulators setting their own trade policy, complete with subsidies (through deposit insurance). In reality, formulating trade policy is the responsibility of the Congress and the executive branch, and regulators should not take an active role unless specifically asked to do so. Furthermore, even if a subsidy to U.S. banks is appropriate, a relaxation of capital regulations may not be the appropriate kind.

The second point raised by Osborn and Evans—that interstate banking will be hindered—indirectly touches on a troubling issue: should bank capital and assets be evaluated in accounting (that is, book-value) or market-value terms? The regulations are based largely on book values, but market valuations better reflect the true risk borne by the deposit insurance system.

The analysts' third point—that banks will not raise prices because of competition with other financial services providers—may be interpreted as arguing that the risk-based capital regulations exceed those that the market would require. They point to two examples of alternatives that typical bank customers can pursue: (large) corporations may borrow directly from the securities market, and swaps may be obtained from nonbank providers. Though these instances do not cover the full range of bank products or customers, they may provide a rationale for reconsidering these portions of the capital requirements.

The fourth point raised by Osborn and Evans—that increased capital will lead banks to take more risks—is debatable. Furlong and Keeley (1987a) question the theory behind this argument, and Furlong (1988) provides ambiguous empirical evidence on the question.

Their final assertion—that regulations may become stricter—is consistent with a regulatory dialectic view of regulation. That is, if regulations are going to accomplish their intended purpose, they must become ever more complex. Osborn and Evans note that several issues, including interest-rate and country risk, have not yet been addressed by the risk-based guidelines.

Conclusion

As the regulatory dialectic theory suggests, any scheme of bank regulation may encounter problems, but the central weakness of our current bank regulatory system does not lie with the institution of capital standards. The main problem is that the government continues to view bank failures as undesirable and has chosen to absorb a substantial portion of the losses when a bank fails.

If the free-market rate of bank failure is unacceptable, some form of regulation is necessary; it is absolutely essential as long as the federal

government bears most of the risk when banks become insolvent. Even if most bankers would not fully exploit deposit insurance, those that would pass the ultimate financial responsibility to federal agencies can cause enormous losses, as has been seen in the savings and loan industry. However, any government plan that seeks to control the risk that banking organizations assume will also provoke attempts to avoid the regulation. Moreover, if the regulators set standards below those that a market without deposit insurance would require, there still exists a subsidy for risk-taking; if the regulators set a higher standard, nonbank competitors are given a competitive advantage.

Notes

¹For a general discussion of capital regulation of unaffiliated banks and bank holding companies see Wall (1985b), and for a discussion of affiliated bank capital see Wall (1985a).

²Some other theories of regulation maintain that government regulation is primarily motivated by the desire of some subsets of society to benefit at the expense of other subsets (called *rent-seeking* in the public choice literature). For example, McCormick (1984) discusses the use of regulation by some firms to alter the structure of the economy to their advantage. Rent-seeking may explain some bank regulation; indeed, Benston (1982) argues that deposit insurance was created to protect small, undiversified banks. Kane's regulatory dialectic theory is not necessarily inconsistent with some of these theories. Moreover, regulatory dialectic appears to be capable of explaining capital regulation. Thus far, little evidence is available to suggest that the capital regulations themselves are due to rent-seeking behavior.

³Keeley (1988b) suggests that a decline in bank charter values began in the 1960s as less restrictive chartering, bank branching, and multibank holding company regulations were adopted over time.

⁴The one exception to this statement would be if investors are so risk-averse that they will not invest in a bank that has a nonzero probability of failure. However, investors appear willing to invest in nonbank firms that may fail, and so they would likely also invest in banks that could fail.

⁵See Wall (1988) for a review of the determinants of corporate capital structure.

⁶Also see Peltzman (1970) and Mingo (1975).

⁷Wall and Peterson (1987, 1988) use a disequilibrium esti-

mation technique that allows both parameter estimation and an estimate of the probability that a given observation came from a particular model. Prior empirical studies of the effectiveness of capital regulation estimated ordinary least squares (OLS) models of banking organizations' capital, which implicitly assume that all organizations are operating under the same model: that capital regulation is either binding or not binding for all banks. Thus, OLS models are misspecified if the regulations are binding on some but not all banking organizations.

⁸Recent examples of poorly understood risk-taking include several banks' participations in loans from Penn Square, Chase Manhattan's dealings with Drysdale Securities, and unauthorized stock trading by Citicorp's affiliate in Ireland.

⁹The Compustat Bank data tapes are a frequently used private, commercial source for researchers who study large bank organizations.

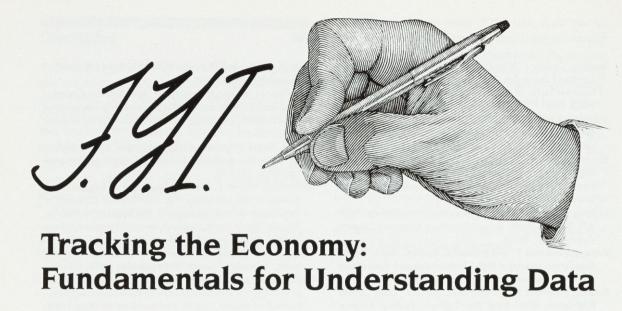
¹⁰ The idea of regulations that are binding but below what the market would require without deposit insurance may seem inconsistent, but it is not. For example, the value-maximizing capital level for a bank with deposit insurance may be 2 percent, whereas the value-maximizing level without deposit insurance may be 5 percent. Any capital requirement greater than 2 percent will be binding and any requirement below 5 percent will be below the market requirements in the absence of deposit insurance.

¹¹ Banks will still attempt to innovate around the capital standards, however, because successful innovation would result in a bank's effectively obtaining a subsidy from deposit insurance.

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R. Mark Rogers

Every month financial markets are deluged with a variety of newly released economic data. Reactions to these are often swift, as prices for various assets adjust to the new information. Each day individual investors mull over the data's implications, and scores of analysts seek new insights into the data's meaning. However, some very basic characteristics of various statistical series are often misunderstood. In fact, many persons who use economic data are not informed about how to read the reported indicators properly. Two basic shortcomings stand out: users often are not aware of the exact meaning of the data series, and they are unaware that data are frequently revised. This second feature may lead an uninformed user to assemble inconsistent data series, which can affect analysis.

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Being sensitive to these two issues can contribute significantly to the accurate interpretation of data, the design of procedures for setting up and maintaining data bases, and in building economic models. This article describes some of the problems involved in interpreting economic statistics, as well as certain common misconceptions about data. Also discussed are a number of pitfalls that may result from uninformed analysis.

Do the Data Really Mean What You Think?

Casual users and experienced economists alike can fall into the trap of falsely assuming they know what various indicators reflect and how they are constructed. First, consider a few examples typical of data misuse, or at least misunderstanding. In June 1988 the nominal personal saving rate fell to 3.9 percent from May's figure of 4.4 percent. Disposable personal income was strong as was personal consumption, which was led by a jump in auto sales. These figures could suggest that consumers removed a substantial amount of money from savings to

make down payments on cars. Yet this conclusion cannot properly be inferred, given the manner in which the saving rate is actually calculated.

Saving is not measured directly by the U.S. Commerce Department; instead, the figure is the residual of estimates for personal income, personal taxes, and personal outlays (including outlays for autos): that is, saving is the result of subtracting personal taxes and outlays from personal income. One might assume, also, that auto consumption is based on a cash floweither the down payment on a new car, or the monthly payments on the entire existing fleet, or possibly even a monthly depreciation figure. In fact, in the monthly auto consumption data, the numbers reflect no depreciation over the life of the vehicle by any method, and the figure entering the personal consumption data actually reflects a car's full purchase price.

This methodology can sometimes have surprising implications. For example, suppose consumer income and outlays—on a cash flow basis—are both constant from one month to the next, but that a larger share of spending went toward automobiles. The national income data would then show a decline in measured saving, even though cash flowing into financial institutions would be constant. For this reason, the personal saving rate swings sharply with the rise or fall in auto sales, and, despite popular belief to the contrary, such changes do not reflect an actual change in the dollar amount held in savings accounts. I

A second example also involves auto sales data. Two basic, separately released series for auto purchases are reported: unit sales and current-dollar sales volume. If for a given month, the current dollar volume of auto sales declines slightly while sales in units are unchanged, it would seem that dealers had reduced prices that month or consumers purchased more lowpriced cars than in the previous period. In fact, neither interpretation can be properly attributed to the data because the two data series are from different sources that employ divergent methodologies. Also, the two series differ somewhat in definitional scope. Unit auto sales data come from manufacturers' own internal records and essentially comprise a universe; that is, this indicator's numbers result from actually counting all the units sold. In contrast, the currentdollar sales data come from Commerce Department surveys of retail establishments. From small but representative samples, the Commerce Department estimates sales for all retailers, including auto dealers. With survey data, any given month's numbers will have sampling error, whereas the unit sales figures essentially do not. Perhaps more importantly, the current-dollar sales data include parts, maintenance, and other goods sold by auto dealers, including trucks, recreational vehicles, boats, and revenues from repair operations. With intervals as short as one month to the next, a meaningful comparison cannot be made between these two data series.

A third example of easily misconstrued economic statistics comes from the two basic types of employment data: household employment and nonfarm payroll employment. If household employment is rising faster than nonfarm payroll employment, it might appear that farm employment is rising relatively quickly. The assumption, of course, would be that the difference between the two employment series is the inclusion or exclusion of farm employees. Yet despite this widely held belief, the inclusion or exclusion of farm workers in each series is only a minor difference and does not explain the divergence between the two series. The primary difference between them is the "side of the labor market" from which the surveys are taken. For the household survey, the U.S. Commerce Department's Census Bureau questions actual households, "the worker side." In contrast, for the nonfarm payroll survey, the U.S. Labor Department's Bureau of Labor Statistics and cooperating state agencies collect mail surveys from businesses, "the employer side." Other major differences exist, but inclusion or exclusion of the agricultural sector is not an important difference.2

Not only can an indicator's construction influence the interpretation of its movement, but the data's use in research can also be significantly affected. For example, an economist might look at how various components of personal income cause changes in the personal saving rate, with the focus on changes in interest income. One might assume that the saving rate for this type of income is higher than for wages and perhaps transfer payments, and that relatively higher interest income would boost the

Table 1.

Regression of Nominal Personal Savings Rate
against Nominal Personal Interest Income as a Share
of Total Personal Income

Variable	Coefficient	Standard Error	t-statistic
Interest Income as a			
Share of Total			
Personal Income	-32.6942	19.2918	-1.69472
Constant	10.1015	2.09953	4.81131
Rho	0.685454	0.140126	4.89170
Regression Period: 1961-1987		Number of Observa	tions: 27
R ² : 0.5981		R ² -adjusted: 0.5820)
Mean of Dependent Variable: 6.88808		Durbin-Watson: 1.94	1923
Standard Error of Regress	sion: 0.945791		

Estimation technique: Cochrane-Orcutt, data downloaded from The WEFA Group, Philadelphia, Pa., November 1, 1988.

personal saving rate. However, the actual construction of data sometimes diverges dramatically from the public's intuitive or conceptual understanding of the data, which can cause quantitative analysis to produce results that differ from those expected. Table 1 shows a brief set of regression statistics with annual average data for the nominal personal saving rate regressed against personal interest income as a share of total personal income. The model is very simple. The optimality of its specification is not the important factor; the impact of the different data sets is. As discussed below, the statistics do not conform to expectations, and the way in which personal interest income is determined may be a reason for this apparent discrepancy.

The explanatory power of this model, which looks at how changes in the share of personal interest income affect changes in the personal saving rate, is reasonably high (according to the R-squared figure), but the key variable for the share of interest income has the opposite sign from what was expected. The negative coefficient of the interest income variable in the model implies that the personal saving rate generally declines as the ratio of personal interest income to total personal income rises.³ Of course, this model is very simple; other key

variables that may help explain the movement in the personal saving rate are omitted. Nonetheless, a key factor behind the negative coefficient for the interest-income variable is probably the way in which a major subcomponent of interest income is derived.

In the process of estimating personal income, the U.S. Commerce Department's Bureau of Economic Analysis imputes various items. Not all income or production is measured directly by the specific exchange of money between consumers and businesses, and certain consumption and income figures themselves may be implied. Within the interest-income component is a subcomponent that is imputed for interest income paid on checking accounts. Since consumers do not receive interest equal to the implied amount, this income difference is assumed to be applied toward the consumption of financial services that are "free" to the customer. In other words, since the Bureau of Economic Analysis measures the production of financial services by the consumption of checking services, a corresponding imputed income component is present because the implied interest payments compensate banks for services rendered. No savings element exists in this personal income component because, by definition, the consumption component equals the

income component. As this interest income component rises, the personal saving rate falls, if other factors are unchanged.

Certainly, the important point being made is not how well this model is specified. Other major variables are omitted. The primary purpose behind the presentation of this model is to introduce doubts about creating models on purely theoretical considerations without taking into account the methodologies behind the data. "Intuition" about the meaning of a data series can lead to misapplication of the data.

Clearly, knowing some details of how indicators are constructed is important. Of course, analysts need first to find this information. At least for government data, the basic material can be located with only minimal effort. Most public sector annual reports contain brief descriptions of how data are derived. Some monthly reports also have such information. The box on page 46 lists frequently watched economic data series along with their sources and references for information on how the data are constructed.

Data Are Revised (More Than You Realize)

A second major consideration for users of economic data is that the various series are frequently revised. In fact, they are changed both continuously and at regular intervals. In addition, different series are revised in varying degrees and according to diverse schedules. Any reader who is confused by all these changes is in very good company. The types and timing of revisions can indeed be difficult to keep up with, even for experienced economy watchers.

The five basic types of data revisions are:

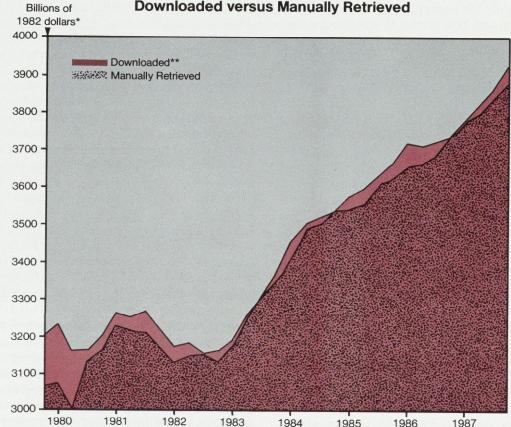
- ongoing changes based on late-received reports or surveys for certain economic indicators;
- new seasonal factors, which usually result in revisions at the beginning of a data year;
- new sources of information, which are also typically incorporated at the beginning of a data year;
- introduction of new survey samples; and

 new benchmarks, or the infrequent (every 5 to 10 years) resetting of data to a new base year.

Before examining these types of changes in more detail, an example should emphasize how significant data revisions can be. Charts 1 and 2 show two quarterly data series for real GNP, from fourth quarter 1979 through 1987. With these series, a comparison can be made between a data series that is known to be consistent (that is, containing data with the same revisions) and one that is not. The first set was downloaded from a commercial data vendor that maintains fully revised data series. The second series was collected manually from published reports in the Federal Reserve Bulletin by a simple process. Beginning with the March 1988 Bulletin. in which data for the fourth quarter of 1987 were first published, data were obtained as far back as listed (through the fourth quarter of 1986). Then the process was repeated, with missing observations picked up in the Bulletin in which they were first released until the series was filled in back to the fourth quarter of 1979. Annualized percentage changes could thus be derived for levels of real GNP in each quarter from 1980 through 1987. The data retrieval procedure used here is inexpensive but demands a good bit of labor. This procedure also will miss revisions that are made to observations prior to those chosen on that specific issue. (More reliable sources for historical data series will be discussed in a later section.)

As Charts 1 and 2 show, the difference between the consistent, downloaded series and the manually retrieved one can be quite significant for many of the observations. The differences are even more noticeable when expressed in annualized percentage changes, as in Chart 2. Essentially, the lesson here is that going backward through monthly published data reports can lead to a data series reflecting numerous separate revisions. The data set can be quite bizarre, resulting in large discrepancies between the manually constructed data set and a consistent data set. One might wonder how significant these differences are. A straightforward comparison, described below, considers two simple regressions of the percent changes in real GNP against percent changes in industrial production.





Since data and data series are changed and updated over time, statistics downloaded from a vendor that maintains revised figures can differ from data that are manually compiled from original sources.

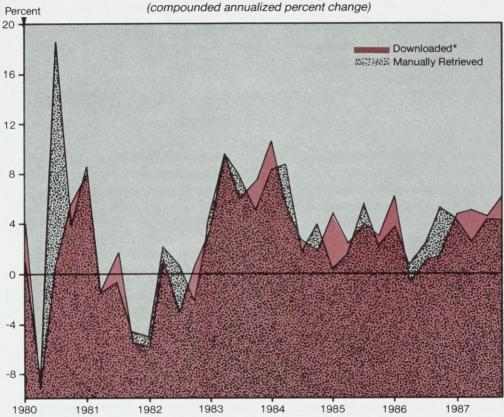
- * Real GNP in the second quarter of 1985 and earlier was based on 1972 dollars. Data were converted to 1982 dollars by using the average ratio for the two series, which were readily available in the Federal Reserve Bulletin for the second quarter of 1985 and the prior three quarters.
- ** Downloaded from The WEFA Group, Philadelphia, Pa., October 27, 1988.

Table 2 has regression statistics based on both consistently revised data series, and Table 3 reports on the regression of the two manually retrieved data series. The industrial production numbers were obtained from the *Federal Reserve Bulletin* in the same manner as described for real GNP, except the data are monthly.⁴ Quarterly average levels were calculated, and percentage changes were derived.

The statistical differences between the two regressions are quite striking. First, the R-squared (which measures the amount of variation in a dependent variable explained by a "model" of independent variables)—with values of 0.7560

versus 0.4330—is dramatically lower for the manually retrieved set than for the model using downloaded data. Second, the estimated coefficients for each of the three explanatory variables differ noticeably. In particular, movement in real GNP is less closely related to industrial production in the manually retrieved version of the model: the regression coefficient and the t-statistic (indicating the likelihood that the measured relationship did not occur by chance) are both lower than for the downloaded series. The constant and rho explain relatively more of the movement in real GNP in the model using manually retrieved numbers.⁵ As one can see

Chart 2. Real GNP Data Downloaded versus Manually Retrieved



Differences in downloaded versus manually retrieved real GNP data are more noticeable when looking at percent changes between designated quarters.

* Downloaded from WEFA, October 27, 1988.

from the significant difference in coefficients, t-statistics, and other regression output, data that are not internally consistent (or that contain different revisions) can very seriously impair statistical studies. The same model specification gives very different model solutions depending on whether the data used are consistent or not.

Note that the "problem" with the data is not that the published monthly numbers are incorrectly represented in the *Federal Reserve Bulletin* (or any other publication). Each month the *Bulletin* includes revised data where appropriate for the data as generally published. Also, notes on revisions are published, but a researcher or observer might not be aware of their significance. The important idea is that

even an excellent current data source probably is not a good source for historical data unless certain precautions are taken to guarantee consistency. This idea applies to the Federal Reserve Bulletin, Survey of Current Business, Monthly Labor Review, or almost any monthly governmental statistical report. Historical revisions are published in these periodicals but only at approximately annual intervals. These revisions will be discussed in greater detail later in this article.

Ongoing Data Revisions. Because of the nature of its collection procedures, most of the government's data series are revised on an ongoing basis. For example, the Census Bureau solicits a significant portion of its data through mail surveys. Even though respondents (private

Table 2. Regression of Percentage Changes in Real GNP against Percentage Changes in Industrial Production

(using downloaded data for both series)

Variable	Coefficient	Standard Error	t-statistic
Percentage Change, Industrial Production	0.460634	0.39036E-01	11.5437
Constant	1.39632	0.316105	4.41726
Rho	-0.339325	0.168949	-2.00845
Regression Period: 1980Q2	2-1987Q4	Number of Observation	ons: 31
R ² : 0.7560		R ² -adjusted: 0.7476	
Mean of Dependent Variable: 2.62037		Durbin-Watson: 1.76652	
Standard Error of Regression: 2.22440			

Estimation technique: Cochrane-Orcutt.

firms or state agencies) are asked to return the questionnaires within a specific time frame, some reports always arrive after the deadline. As the late reports are received, they are added to the previously gathered data even though a given month's estimates may have already been released to the public. However, data are not necessarily always revised in an upward direction. Data for missing respondents are usually imputed but are eventually replaced when actual data are received. Actual data can be higher or lower than imputed data. Mail survey series of this nature include housing permits, retail sales, new factory orders, and business inventories.

The Bureau of Labor Statistics has surveytype data series with similar revisions for payroll employment and producer price indicators. In contrast, household employment and consumer prices are not revised on an ongoing basis.⁶ The key difference is that these measures are derived from field surveys by agencies, and there is no need for incorporation of late data. The Census Bureau completes its internal reports and turns the data over to the Bureau of Labor Statistics. At this point the data set is complete.

For certain data series some respondents, by design, only report after a lag. These people are not submitting data past requested deadlines;

instead, some survey panels are designed such that only certain portions of the sample file their statistics at a given time. Each month perhaps one-third of the sample reports to a government agency. For example, with three panels, A, B, and C, Panel A may report data in June for the month of May (and the earlier months of March and April). The following month, Panel B of the survey sample would provide data for June, May, and April. Panel C in August would report on July, June, and May, and so on. In this way, not all survey panelists are burdened with compiling data every month. Nevertheless, as lagged (rather than late) reports are incorporated into earlier ones, the data are revised and become more representative of the overall sample. Retail and wholesale trade figures are updated in roughly this manner. (The division of reporting by panelists is actually more complex than in the example just described.) In fact, for retail sales, each panel reports data for only two months out of three.

A third way that ongoing revisions occur is with a special type of seasonal adjustment procedure known as concurrent adjustment. Series that use this type of revision include retail sales, wholesale trade, durables orders, housing starts, and housing permits. A number of variations to this procedure are possible, but in general, the seasonal factor for the most recently published

Table 3. Regression of Percentage Changes in Real GNP against Percentage Changes in Industrial Production

(using manually retrieved data for both series)

Variable	Coefficient	Standard Error	t-statistic
Percentage Change,			
Industrial Production	0.345140	0.592843E-01	5.82179
Constant	2.28466	0.506953	4.50665
Rho	-0.449413	0.160446	-2.80102
Regression Period: 1980Q2	?-1987Q4	Number of Observation	ns: 31
R ² : 0.4330		R ² -adjusted: 0.4135	
Mean of Dependent Variable: 3.15655		Durbin-Watson: 1.98640	
Standard Error of Regression: 3.91939			

Estimation technique: Cochrane-Orcutt.

observation incorporates the addition of the new data from the current year and is not an extrapolation solely from data for previous calendar years. With concurrent adjustment, some series have revisions in the seasonal factors for year-ago data. Retail sales and wholesale trade figures, for example, have year-ago revisions. Table 4 (see page 42) indicates the monthly series that have ongoing revisions and when they are timed.

If data that are revised on an ongoing basis were altered to the same extent and time for all monthly series, tracking the economy would be a little easier. Various series are revised further back than others, though. Three brief examples can demonstrate the diversity in the treatment of ongoing revisions. The Census Bureau's housing starts data are generally updated for the two months prior to the month of the current release. That is, when data for August are released, June and July figures are revised. For producer prices, a typical month's release reflects revised data for one previous month only: the month four months prior to the most recent release. For example, when the October producer price indexes are released, data for June are revised but not for July, August, or September. Finally, for Commerce's index of leading indicators, the 12 months prior to any current release are subject to revision. When the July index is released, revisions can be made back to July of the previous year. Table 4 also shows how far back data are typically revised on an ongoing basis.

Divergent methodologies behind the construction of various economic indicators make different revision patterns more efficient for various series. For example, the timing of data changes for construction outlays is unusual, but with good reason. Typically, ongoing revisions go back only two months. However, every third month, revisions are made to reflect five months of activity. This odd schedule occurs because many of the outlay subcomponents are based on quarterly surveys. Between the release of these quarterly reports, the monthly subcomponents are simply extrapolations. With new quarterly survey data, revisions further back than two months are necessary to complete an accurate reporting of the data.

Historical Seasonal Adjustment Revisions. Data can be presented in seasonally adjusted or not seasonally adjusted form. With seasonal adjustments, the data theoretically have had regular, intrayear patterns removed. The idea behind seasonal adjustment is that one might be interested in underlying cyclical changes in economic activity. In other words, an observed change in a series may be more or less than what one would have expected on the basis of seasonal norms. For example, to know if a retail

sales rise in December means the consumer sector has strengthened, one must know how much changes in December sales typically differ from other months. Indicators for which seasonally adjusted data are very useful include, for instance, new home sales, electricity output, heating oil usage, and auto production.

Seasonal factors are derived as a residual of other primary components in the data, which also include trend and irregular factors.7 Irregular factors consist of events such as unusual weather, strikes, and political events. Trend represents longer-term movement. For example, the work force may be expanding over the long term (trend), but seasonal factors may cause declines after summer or Christmas. To separate these various components, moving averages-which reflect periods that sum to a year, such as 12-month moving averages, fourquarter moving averages, and so on—are used. A ratio of each period as represented by the moving average is then calculated for the unadjusted data to the trend.

After irregular movements are removed (usually "mechanically" but at times by "judgment" but with various statistical guides for defining extremes in data), these ratios represent seasonal factors. Typically, these ratios are examined over three to ten years to achieve more reliable estimates. Hence, seasonal factors are typically calculated from an average of these ratios over time. As the period chosen to calculate moving averages shifts, the averages for the ratios, and thus the seasonal factors, change. At the end of each data year, a new period of moving averages becomes available to calculate an updated set of ratios, and seasonal factors can be reestimated based on the new three-to-ten year period. At the start of each data year, new seasonal factors cause revisions to seasonally adjusted data for the entire period for which moving averages and ratios-to-moving averages were calculated. Table 4 indicates for each data series when new seasonal factors are generally released and how far back revisions typically

Users of seasonally adjusted data should be aware of a few caveats. First and foremost, seasonal adjustment procedures, though quite technical, do not always work perfectly. Shifting trend patterns may cause seasonal factors to change rapidly, and new "seasonals" may not

adequately keep pace with the changes, especially if moving averages are based on many years for estimation of seasonal factors. Whenever a structural shift in data series affects seasonal patterns, several years can elapse before the period subject to revisions contains only the new structure. For this reason, government agencies often choose to use fewer years in calculating seasonal adjustment. For example, the Labor Department gauges seasonality with only five years of Producer Price Index (PPI) and Consumer Price Index (CPI) data since seasonal pricing patterns tend to shift over time.

Another cause for concern about seasonal factors is that the seasonal components of some series may be overwhelmed by other factors. For example, oil imports (in physical volume) accelerate prior to and during winter months and are accompanied by seasonal fluctuations in prices. However, larger changes in oil prices (perhaps resulting from cartel decisions) can lead to changes in the timing of oil imports.

A further warning to users of data series is that irregular factors can cause unexpectedly strong movement in adjusted data, especially when seasonal factors are large. For example, housing sales are typically very weak in the winter, making seasonal factors quite large. When unadjusted data show any strengthening over those months, the improvement is magnified. An unusually warm February, an irregular factor, can cause seasonally adjusted new single-family housing sales to appear exceptionally strong since winter weather is not typically conducive to "house shopping."

A final caveat regarding seasonal adjustment is that it is almost always done at fine levels of disaggregation; that is, a data series as a whole is typically not subjected to seasonal adjustment procedures, but components of it are. In fact, there really are no aggregate seasonal factors for most data series, just for the smaller components. Only after they have been seasonally adjusted are the components then summed to achieve a total. Depending on the relative importance of various components, the ratio of seasonally adjusted aggregates to the unadjusted total may vary for a given period in the year. However, in some instances components are seasonally adjusted individually, and some intermediate aggregates are then adjusted in their own right. In these cases, the sum of

seasonally adjusted components generally will not equal seasonally adjusted aggregates. Components and the overall index of industrial production are adjusted this way. Also, with merchandise trade data, only six end-use export and import categories are seasonally adjusted; more detailed components are not.

Revisions Based on New Sources of Information. Many data series use different sources for preliminary estimates than for calculations made one to two years later. More accurate industry data may be publicly available than when preliminary estimates were made. This is certainly true for many GNP components. For example, some components of personal income and consumption are revised as the Bureau of Economic Analysis switches to more reliable, although less current, sources of data.

For personal income, wages and salaries in private industries are initially estimated with the Labor Department's monthly employment reports series for production workers, hours worked, and earnings. In annual revisions, more accurate data are available from state unemployment insurance agencies. In preliminary personal income estimates, the other labor income component is simply an extrapolation. Later, data are gathered from a variety of sources including the Internal Revenue Service, private pension and profit-sharing funds, and certain trade sources. These are just two examples of how preliminary sources differ from later, annual revisions. In fact, most data series have different sources for preliminary estimates and revised data available one or more years later. Government agencies employ various statistical techniques to establish the relationship between preliminary data sources and later-used data sources. Nonetheless, the annual revisions can be noticeable.8

The July 1988 Survey of Current Business summarized the 1985-87 annual revisions to GNP data. "Over the period from the fourth quarter of 1984 to the first quarter of 1988, the growth rate (average annual rate of increase) for real GNP was revised up 0.3 percentage points—from 3.2 percent to 3.5 percent." For various components, the revisions were larger. Nominal personal income and disposable personal income growth were revised, respectively, to 7.5 percent and 7.4 percent—about 1 percentage point more than previously estimated.

Occasionally, data series are constructed from new sources or with new methodologies. The reasons for these changes are usually straightforward: old data sources may no longer be available, or superior ways of estimating preliminary data (or even historical data) may have been devised. These types of changes generally are made concurrent with annual revisions or the more infrequent benchmark revisions, which are discussed later in this article. The particular series and observations that are affected are not predictable and are known only by reading specially published articles and annual reports for the data. Of course, source agencies are able to inform analysts authoritatively on major changes to specific series.

Introduction of New Survey Panels

As mentioned earlier, a number of data series are derived from surveys. Series such as retail trade and wholesale trade rotate among the panel members in the survey sample on a monthly basis; that is, each panelist may be interviewed or surveyed only once every three months. However, the panelists themselves are also changed at set times—about every five years for retail and wholesale trade, for example. Strictly speaking, when government agencies receive data from new panelists, in terms of consistency, a new data series has begun. However, restarting data series every five years would limit the usefulness of this information.

In order to make the summary data from different panelists consistent, the series are mathematically "linked" by obtaining from the new survey members data that correspond to the later observations of the previous panel. In other words, the data series are linked by comparing data from both panels over the common or overlapping time period. If new panelists begin reporting in 1986, as was the case for wholesale trade, 1985 data from both the old and new respondents could be analyzed and revised to make the new and old levels consistent. Generally, previous month-to-month percentage change patterns are maintained as much as possible with the new data. The reporting agency usually announces panel changes well in advance.9

Benchmark Revisions

Benchmark revisions essentially are adjustments that make historical data correspond to major new information. This process pegs old data to more reliable standards or "benchmarks." Government agencies approach benchmark revisions in different ways. Regardless of the varying procedures for different series, benchmark revisions generally reflect one or a number of the following changes:

- incorporating major new source data that are available at infrequent intervals;
- · incorporating changes in methodology;
- when applicable, incorporating a new base period for indexes or constant-dollar series;
- covering a major portion of or even the entire series historically; and
- incorporating changes made in annual revisions that occurred in nonbenchmark years.

An example of benchmark revisions should make the concept clearer.

In July 1985 the Federal Reserve Board of Governors released newly benchmarked data for industrial production. The changes reflected a process of checking monthly and annual industrial production estimates against the production benchmarks provided every five years by the Census of Manufactures and the Census of Mineral Industries. In this process, the Fed adjusts various production components' annual levels to correspond to those levels shown by the Census Bureau. Monthly patterns are then set to resemble what prevailed previously while being consistent with the new, annual data. In other words, months formerly known to be strong (or weak) will likely remain so, but the magnitude may differ in order to have monthly levels average to the required annual levels. Revisions of this major nature cannot occur every year since Census obtains this type of reliable industry-wide data only every half-decade. In non-Census years, the Federal Reserve must use other techniques to estimate production. However, the Census benchmarks provide the basis for the interim estimation processes and the standard against which earlier estimates must be revised.

The 1985 benchmark revisions to industrial production included new ways of estimating various components. The industry classification system was changed to match the 1977 Standard Industrial Classification (SIC), and new subcomponents were added. Importantly, this benchmarking of the industrial production index included a change in the base year from 1967 to 1977. The components were also reweighted to reflect the new base year, a procedure that has ramifications for data analysis that are not always understood.

For data series that are indexed, or in constant dollars, the changing to a new base year indicates that the components of the series have been assigned new weights that reflect patterns of the chosen base year. Usually the values for the base year are set equal to "100." Any subsequent value in the index will indicate the percentage change from the base period. For example, if 1980 is the base year of an index set equal to 100 that year, a value of 130 in 1982 indicates that the index has risen 30 percent over that two-year period. The relative size of a component in either index will grow if that component is expanding relatively faster than other components. For industrial production, the business equipment component has a higher weight in the 1977 base index than in the 1967 base index because of gains in that industry during the 10 years.

For all indexes and constant-dollar series, rebasing affects the numerical level of each observation. If industrial production is rebased from 1967 = 100 to 1977 = 100, all component observations will have lower numerical values (assuming business activity has expanded over that period). However, changing relative weights for the various components does not always affect all historical data. Industrial production exemplifies this point, as is shown in a 1986 Federal Reserve Board description of the methodology used for this industry's figures:

The industrial production index uses different value-added weights for different years in an attempt to represent accurately the evolution of relative prices. In the revised index, 1967 weights have been used for the 1967-72 period, 1972 weights for the 1972-77 period, and 1977 weights from 1977 to the present. The individual series and the weighted aggregates for each of these periods have been linked to form a con-

tinuous index expressed as a percentage of output in 1977. 10

Other important data series, such as the Labor Department's producer and consumer price indexes, have linked indexes that combine periods with different weights for components.

Many, if not most, rebased series, including real GNP and personal income, have one weighting scheme for historical data. The relative size of various subcomponents can play a major role, though, in the growth rates of larger components. For example, in real GNP, oil imports have become dramatically more important because in 1982 oil imports were much higher priced than in 1972, leading to increased dollar volume and thus added weight in real GNP. As a result, changes in oil prices lead to greater fluctuations in 1982-base real GNP than in 1972base real GNP. Researchers should be aware of each data series' rebasing history since relative weights of components can significantly affect the statistics in quantitative studies.11

Obtaining Consistent Data. How do analysts know that they are using a consistent data series? Numerous ways to ensure data consistency are available, although the expense for each varies. The simplest but most expensive method is to use electronically retrieved (downloaded) data from commercial vendors, who are generally meticulous about keeping data series properly updated. For researchers on a tighter budget, other options exist. Though monthly or quarterly publications are risky sources, in terms of receiving inconsistent data, summary annual reports from government agencies often

provide consistent historical data going back five or more years. If more than one annual report is needed to retrieve the amount of data desired, explanations of how and when revisions took place are usually found in the notes to the respective publication. Hence, one can more readily check for consistency.

Several less well-known options for obtaining historical data are available to researchers. Many government agencies still produce traditional, bulky data tapes, though more recently data have been converted onto diskettes for use with personal computers. In fact, the format options for these diskettes often include directly loading the data into popular spreadsheet programs. Finally, the various government agencies are generally quite cooperative in meeting requests for printouts of historical data if the series requested are specific and of limited number.

Conclusion

Careful analysis of economic indicators requires a little homework to identify and comprehend the full meaning of changes in the data. Certainly, descriptions of the updates are slow reading, but learning the basics about how indicators are constructed adds significantly to one's understanding of the analysis of business conditions. Data management has never been a simple exercise, but for economic analysis the need to have consistent data series far outweighs the effort required to construct them.

Table 4. Economic Indicators: Timing of Release and Revisions

(Indicators appear in general sequence of release in a given month)

Indicator	Source Agency	In Calendar January, Release Is for Data Month of:	In Calendar January, Ongoing Revisions Are Made for Data Month(s) of: ²	Historical Revisions for Seasonal Factors Usually Released with Data for Month (Quarter) of: ³	Historical Revisions to Seasonal Factors Usually Cover: ⁴
1 Household Employment	U.S. Department of Labor, Bureau of Labor Statistics	December	None	December	Previous 5 calendar years; X-11 ARIMA extrapolation for current year in 6-month intervals. ⁵
2 Establishment Employment	U.S. Department of Labor, Bureau of Labor Statistics	December	October, November	May	Previous 5 calendar years; X-11 ARIMA extrapolation for current year.
3 Unit New Auto Sales	U.S. Department of Commerce, Bureau of Economic Analysis with source data from Motor Vehicle Manufacturers Ass'n., Detroit, MI, and Ward's, Detroit, MI.	December	None	June	Previous 3 calendar years.
4 Wholesale Trade	U.S. Department of Commerce, Bureau of the Census	November	October and also November of previous year. All current releases include revisions to prior month and year-ago month only. ⁶	January	Sales adjusted back to a recent quinquennial Census. Inventories adjusted back to 1980 when data are first non LIFO; concurrent adjustment made for prior month of release and year-ago month.
5 Advance Retail Sales	U.S. Department of Commerce, Bureau of the Census	December	October, and November, and November and December of previous year ⁶	January, but not released in advance report	Usually adjusted back from the recent quinquennial Census; concurrent adjustment for current and previous year.

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Indicator	Source Agency	In Calendar January, Release Is for Data Month of:	In Calendar January, Ongoing Revisions Are Made for Data Month(s) of: ²	Historical Revisions for Seasonal Factors Usually Released with Data for Month (Quarter) of: ³	Historical Revisions to Seasonal Factors Usually Cover: ⁴
6 Monthly Reta Sales and Inventories Report	il U.S. Department of Commerce, Bureau of the Census	November	For sales, October of current year and November and December of previous year. For inventories, October of current year and November of previous year.	January	Usually adjusted back from the recent quinquennial census; concurrent adjust- ment for current and previous year.
7 Business Inventories	U.S. Department of Commerce, Bureau of the Census	November	Data are manufacturers', wholesale, and retail components.	Data are manufacturers', wholesale, and retail components.	Data are manufacturers', wholesale, and retail components.
8 Advance Report, Merchandise Trade	U.S. Department of Commerce, Bureau of the Census	November	October	January	Just the prior year to current year; X-11 ARIMA for current year.
9 Producer Price Index	U.S. Department of Labor, Bureau of Labor Statistics	December	August only	January	Previous 5 calendar years; for current year, previous year's factors are used at five levels of disaggregation.
10 Industrial Production	Federal Reserve Board	December	September-November	July	Previous 3 calendar years
11 Capacity Utilization Rates	Federal Reserve Board	December	September-November	July	Previous 3 calendar years
12 Housing Starts	U.S. Department of Commerce, Bureau of the Census	December	October, November	January	Previous 3 calendar years; concurrent adjustment for current year.
13 Housing Permits	U.S. Department of Commerce, Bureau of the Census	December	November	April	Previous 2 calendar years; concurrent adjustment for current year.

TABLE CONTINUED ON NEXT PAGE

TABLE 4 (CONTINUED)

Indicator	Source Agency	In Calendar January, Release Is for Data Month of:	In Calendar January, Ongoing Revisions Are Made for Data Month(s) of: ²	Historical Revisions for Seasonal Factors Usually Released with Data for Month (Quarter) of: ³	Historical Revisions to Seasonal Factors Usually Cover: ⁴
14 Consumer Price Index	U.S. Department of Labor, Bureau of Labor Statistics	December	None	January	Previous 5 calendar years; for current year, previous year's factors are used at five levels of disaggregation.
National	U.S. Department of Commerce, Bureau of Economic Analysis	See GNP notes at end of table.	See GNP notes at end of table.	Second quarter, July calendar release.	Previous 3 calendar years.
Income,	U.S. Department of Commerce, Bureau of Economic Analysis	December	For the months that are open for GNP revision (prior 2 to 5 months).	June	Previous 3 calendar years.
Report,	U.S. Department of Commerce, Bureau of the Census	December	November	Varies, depending on timing of benchmark completion.	Typically back to most recent census year; concurrent adjustment for current year.
One-Family	U.S. Department of Commerce, Bureau of the Census	December ⁷	September, October, and November	January	Previous 3 calendar years; concurrent adjustment for current year.
Outlays	U.S. Department of Commerce, Bureau of the Census	November	July - October; For data months of February and August (i.e., calendar May and October) revisions are made to prior 4 months. For other releases, revisions are to prior 2 months.	May	Previous 3 calendar years; concurrent adjustment for current year.

TABLE 4 (CONTINUED)

Indicator	Source Agency	In Calendar January, Release Is for Data Month of:	In Calendar January, Ongoing Revisions Are Made for Data Month(s) of: ²	Historical Revisions for Seasonal Factors Usually Released with Data for Month (Quarter) of: ³	Historical Revisions to Seasonal Factors Usually Cover: ⁴
20 Index of Leading Indicators	U.S. Department of Commerce, Bureau of Economic Analysis	December ⁷	Twelve months prior to December	Not applicable, depends on source agencies for components.	Not applicable, depends on source agency. LI revisions generally limited to ongoing basis.
21 Manufacturers' Shipments, Inventories, and Orders	U.S. Department of Commerce, Bureau of the Census	December ⁷	October	Varies, depending on timing of benchmark completion.	Typically back to most recent census year; concurrent adjustment for current year.

Notes

For GNP: data are quarterly, although revisions occur monthly. The first release of data for any given quarter occurs the first month of the following calendar quarter. For example, first quarter GNP data are originally released in April of a given year. In May and June, first quarter data are revised. These releases in April, May, and June are referred to as "advance," "preliminary," and "revised" estimates, respectively, for that quarter. No other previous quarters are revised. Until annual revisions are made, no additional revisions are made following the release of the "revised" estimate. Annual revisions released in calendar July generally result in revisions to the previous three calendar years and the first five months of the current year. Benchmark revisions generally result in the revisions of estimates for the previous eleven or more years.

¹The revisions notes generally apply only to seasonally adjusted data. Data not seasonally adjusted are usually revised less frequently on an ongoing basis.

²These examples are for month of January. For subsequent months, add appropriately.

³The columns reflect standard procedures. However, these facets of the various releases may change due to special circumstances in a given year. For example, five-year benchmark computations have in the past led to the delay of annual revisions that year for industrial production.

⁴Seasonal factor calculations are usually based on more historical data than are actually revised in publication.

⁵In series where X-11 ARIMA is used for extrapolation in current year, X-11 ARIMA generally is also used for historical seasonal factors.

⁶For retail sales and wholesale trade, ongoing revisions for prior year are for seasonally adjusted data only.

⁷These data series are generally released the last week of a calendar month, but, depending on holidays and other factors, releases may fall into the first week of the next month.

Economic Indicators and Related Reference Material

The following provides the reader with an overview of 17 common groups of economic indicators as well as the sources for locating these data.

Employment-household and nonfarm payroll, unemployment rates, and average weekly hours and earnings, by the U.S. Department of Labor. Each monthly News, The Employment Situation put out by the Bureau of Labor Statistics contains numerous explanatory notes. The BLS Handbook of Methods, 1988, goes into greater detail on the methodologies and gives further technical references. The Labor Department's monthly publication, Employment and Earnings, contains some of the same information as The BLS Handbook of Methods. See also Handbook of Cyclical Indicators, 1984 (BEA) and Monthly Labor Review, "Notes on Current Labor Statistics." The Labor Department's Monthly Labor Review also publishes these data series but with a slightly longer lag than the News. Recommended reading includes "Comparing Employment Estimates from Household and Payroll Surveys," by Gloria P. Green, Monthly Labor Review, December 1969, pp. 9-20.

Auto Sales—Unit New, as released by the U.S. Department of Commerce in *Survey of Current Business*, section 5-32. The Bureau of Economic Analysis (BEA) collects data primarily from the Motor Vehicle Manufacturers' Association (MVMA), Detroit, Michigan (for domestic sales), and also from *Ward's Automotive Reports* (for import sales). Data essentially are reported by manufacturers' individual marketing sections and compiled by MVMA and Ward's. No written documentation is available. The BEA seasonally adjusts the data.

Retail Sales and Inventories, by the U.S. Department of Commerce. Basic information on data is found in each monthly issue of *Monthly Retail Trade*, published by the U.S. Department of Commerce, Bureau of the Census. Only retail sales data appear in the earlier release, *Advance Retail Sales*, also published by the Bureau. See also "Retail Sales: A Primer," by R. Mark Rogers, *Economic Review*, Federal Reserve Bank of Atlanta, April 1985, pp. 28-33.

Industrial Production, by the Federal Reserve Board of Governors. Monthly data are in *Federal Reserve Statistical Release*, *G.12.3*, *Industrial Production* and in *Federal Reserve Bulletin*. Brief explanatory notes are included. Details for the

construction of the data can be found in *Industrial Production - 1986 Edition, With a Description of the Methodology,* which is published by the Board of Governors but is not an "annual" version of the monthly releases. Data are historical and in fine detail. This publication usually follows major benchmark revisions of the data. The latest edition also includes chapters on "Seasonal Adjustment," "Uses and Limitations of the Index," "History of the Index," and a "Glossary of Terms."

Capacity Utilization Rates, by the Federal Reserve Board of Governors. Monthly data are in Federal Reserve Statistical Release, G.3, Capacity Utilization, and in Federal Reserve Bulletin. Explanatory notes are generally minimal. Information on methodology can be found in a special article, "Revised Federal Reserve Rates and Capacity Utilization," in the section, "Appendix: Methodology," Federal Reserve Bulletin, October 1985, pp. 760-766, by Richard D. Raddock. Other useful information can be found in: "New Federal Reserve Measures of Capacity and Capacity Utilization," Federal Reserve Bulletin, July 1983, pp. 515-521, by Ronald F. Rost; and "Capacity Utilization," by Marjorie H. Schnader in The Handbook of Economic and Financial Measures, edited by Fabozzi and Greenfield. Dow Iones-Irwin. Homewood, Illinois, 1984, pp. 74-104.

Gross National Product, by the U.S. Department of Commerce. Data are quarterly, but releases are monthly when revisions are included. The most commonly used publication for these reports is Commerce's monthly Survey of Current Business. Explanatory notes occur at irregular intervals. The July issues generally have revised data for the previous three calendar years. See the National Income and Product Accounts of the United States. 1929-82: Statistical Tables for historical data. The best overview is "GNP: An Overview of Source Data and Estimating Methods," by Carol S. Carson, Survey of Current Business, July 1987, pp. 103-126. This also has been published in the Methodology Paper Series by the BEA as MP-4 (GPO stock no. 003-010-00179-8). The article discusses components on both the product and income sides of the national income and product accounts. The latter section of the article contains an extensive "directory to information about GNP" which lists numerous previously published articles and papers on the sources for various GNP components. The BEA also has published several other methodology papers: Introduction to National Economic Accounting (1985), Methodology Paper Series MP-1 (GPO stock no. 003-010-00158-5); Corporate Profits: Profits Before Tax, Profits Tax Liability, and Dividends (1985), Methodology Paper Series MP-2 (GPO stock no. 003-010-00143-7); Foreign Transactions (1987), Methodology Paper Series MP-3 (GPO stock no. 003-010-00178-0); Government Transactions (1988), Methodology Paper Series MP-5 (GPO stock no. 003-010-00187-9). Forthcoming are papers on personal consumption expenditures (planned for 1989) and gross private domestic fixed investment.

Personal Income, Personal Consumption Expenditures, and Personal Taxes, by the U.S. Department of Commerce. Data are monthly and appear in the Commerce Department's Survey of Current Business, among other sources. The only major review of the information is "Monthly Estimates of Personal Income, Taxes, and Outlays," by James C. Byrnes et al., Survey of Current Business, November 1979, pp. 18-38. Another useful article is "GNP: An Overview of Source Data and Estimating Methods," by Carol S. Carson, Survey of Current Business, July 1987, pp. 103-126. The BEA plans to publish a methodology paper in 1989 on personal consumption expenditures.

Manufacturers' Shipments, Inventories, and Orders, by the U.S. Department of Commerce. Data are monthly and appear in Commerce's Current Industrial Reports, Manufacturers' Shipments, Inventories and Orders, otherwise known as "M3-1" reports. Information on derivation of the data is found in the annual reports under the same title as the monthly reports.

Housing Starts, by the U.S. Department of Commerce. Data are monthly and appear in *Current Construction Reports: Housing Starts*, otherwise known as "C20" reports. More extensive information on the derivation of data is found in each January issue when revised seasonal factors are released.

Housing Permits, by the U.S. Department of Commerce. Data are monthly and appear in *Current Construction Reports: Housing Units Authorized by Building Permits,* otherwise known as "C40" reports. More extensive information on the derivation of data is found in each April issue when revised seasonal factors are released. See also the January or April issues of *Current Construction Reports: Housing Starts.*

Construction Expenditures, by the U.S. Department of Commerce. Data are monthly and appear in *Current Construction Reports, Value of New Construction Put in Place,* otherwise known as "C30" reports. Information on methodology is found in each May issue when revised seasonal factors are released.

Producer Price Index, by the U.S. Department of Labor. Data are monthly and appear in the Labor Department's Summary Data from the Producer Price Index News Release and slightly later in the Monthly Labor Review. This publication and more detailed data are found in Labor's monthly Producer Price Indexes publication. The Monthly Labor Review contains some explanatory material. More extensive notes can be found in the BLS Handbook of Methods, 1988.

Consumer Price Index, by the U.S. Department of Labor. Data are monthly and appear in the Labor Department's Summary Data from the Consumer Price Index News Release and slightly later in the Monthly Labor Review. More detailed data are found in Labor's monthly CPI Detailed Report. Some explanatory material can be found in this publication, Summary Data, and the Monthly Labor Review. More extensive information can be found in the BLS Handbook of Methods, 1988. See also The Consumer Price Index: 1987 Revision, Report 736 (Bureau of Labor Statistics, 1987) for information on the recent rebasing of the CPI to reflect 1982-84 expenditure patterns.

Merchandise Trade, Advance Report, by the U.S. Department of Commerce. Data are monthly and are published in Census' *Highlights of U.S. Export and Import Trade*. Explanatory notes are included.

Wholesale Trade, by the U.S. Department of Commerce. Data are monthly and are published in *Monthly Wholesale Trade*. Explanatory notes are in each issue.

New One-Family Houses Sold and for Sale, by the U.S. Department of Commerce. Data are monthly and are published in *Current Construction Reports, New One-Family Houses Sold and For Sale,* otherwise known as "C25" reports. More extensive information is found in the January issue when revised seasonal factors are released.

Index of Leading Indicators, by the U.S. Department of Commerce. Data are monthly and are published in *United States Department of Com-*

merce News: Composite Indexes of Leading, Coincident, and Lagging Indicators and also Commerce's Business Conditions Digest. Few explanatory notes appear in News, but extensive notes can be found in Commerce's Handbook of Cyclical Indicators, 1984, and in each issue of Business Conditions Digest. Numerous articles have been written in economic and financial literature about the index of leading indicators. See "A Descriptive

Analysis of Economic Indicators," by Ronald A. Rath, *Review*, Federal Reserve Bank of St. Louis, January 1985, pp. 14-24. Information on the latest changes in methodology and make-up of these indexes can be found in Marie P. Hertzberg and Barry A. Beckman, "Business Cycle Indicators: Revised Composite Indexes," *Survey of Current Business*, January 1984, pp. 23-28.

Notes

The obvious question is, why does the Commerce Department use this method? The reason is found in the primary purpose underlying the collection of personal consumption data: to serve as one of many inputs going into the indirect measurement of production, that is, GNP. Commerce, at this point, is concerned primarily with measuring changes in stocks of goods (inventories) and allocating consumption between current and past production. The BEA, theoretically, could base auto consumption on depreciation, but a "consumer inventory investment" category would have to be created to account for the difference between sales value and depreciation.

²While payroll data specifically exclude farm workers, the household survey picks up some households that may be referred to as *farm households*. These households are a very small percentage of total household data. The interested reader should see David Avery, "Two Measures of Employment: What Can They Tell Us?" Federal Reserve Bank of Atlanta *Economic Review* 71 (August/September 1986): 32-39.

³With the use of ordinary least squares estimation, the implications are the same. The interest income-share variable has a negative coefficient. The "explanatory power" of the model is lower in terms of the R-squared, however. Over the time period 1960-87 the regression statistics are: R², 0.2030; R²-adjusted, 0.1724; coefficient for interest income share, -22.8542 (t-statistic, -2.57344); constant, 9.06431 (t-statistic, 10.1160); mean of dependent variable, 6.84946; standard error of regression, 1.31913; Durbin-Watson, 0.57164.

⁴Where necessary, a conversion factor was calculated to convert 1967 base data for industrial production to the most recent base year of 1977. Data from October 1979 through September 1984 were originally in the 1967 base. This is not the same as official rebasing but is only a crude approximation.

⁵The Cochrane-Orcutt estimation technique is used instead of ordinary least squares in order to correct for serial correlation. Use of ordinary least squares did not change the comparison between the two regressions. In fact, the difference between the R-squareds is even more pronounced with ordinary least squares. In large samples, rho is simply the correlation coefficient between the error term in period t and period t-1 if ordinary least squares is used.

⁶This statement regarding household employment applies to the national level. State figures are derived from different estimation techniques.

⁷Some seasonal adjustment programs are also set up to separate out a cyclical component. Typically, the trend and cyclical components are treated as the same when moving averages are of short enough length. This is explained further below.

⁸Statistical techniques and readily available data do a reasonably good job of estimating preliminary data. However, the current correlated movement between indicators X and Y may not be the same in revised data as with the very preliminary data. On occasion, for example, the index of leading indicators may provide the so-called "three consecutive declines" rule of thumb for predicting near-term recession. Later revisions may actually wipe out all of the declines if they were modest originally. Does this mean the data are bad? Probably not, but one should be aware of how reliable data are in terms of eventual revision when trying to analyze, forecast, or correlate one indicator with another.

⁹For further information on these procedures, see *Current Business Report, Revised Monthly Wholesale Trade, Sales and Inventories, December 1980 Through December 1987.*

¹⁰Industrial Production, 1986 Edition: With a Description of the Methodology, Federal Reserve Board of Governors, 3.

11 See R. Mark Rogers, "Effects of Oil Price Shocks on Measured GNP Growth." Federal Reserve Bank of Atlanta Economic Review 72 (Summer 1987): 52-64.



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Book Review

The Netherlands and the Gold Standard, 1931-1936: A Study in Policy Formation and Policy

Edited by Richard T. Griffiths.

Amsterdam: Nederlandsch Economisch-Historisch Archief, 1987.

214 pages. \$37.50.

The Gold Standard and the International Monetary System 1900-1939

by Ian M. Drummond.

London: Macmillan Education Ltd., 1987.

71 pages. \$9.95.



Persuasive evidence for old debates often comes in unexpected forms. Such is the case with *The Netherlands and the Gold Standard, 1931-1936.* The debate concerns the stability usually associated with a gold-backed currency: does the stability result from the gold standard, or is such stability a prerequisite for the maintenance of the standard? Although not the editor's main purpose, this book provides substantial evidence that it is the stability that permits the gold standard; gold does not by itself provide that stability.

By 1931 the gold standard, under which a nation's currency can be converted into fixed amounts of the precious metal, had unraveled in most countries, with the notable exceptions of the Netherlands, France, Belgium, and Switzerland: the "gold bloc" countries. Of these four nations, the Netherlands was the last to come off the gold standard; it did so, reluctantly, in 1936.

The Netherlands and the Gold Standard, 1931-1936 helps explain how this country aban-

doned its gold-based currency. The book contains nine chapters, each of which reports on the events of the period through the experience of different groups; for example, Chapter 3 is titled "The Employers Association," Chapter 4, "The Agricultural Lobby," Chapter 5, "The Trade Unions," and so on. Like a multiperspective novel, the chapters in this collection tend to recount the same basic events as seen by a variety of interested parties. Given its rather narrow topic, this book would not seem particularly interesting, no matter how good a job the authors or editor did. The story that emerges, however, should be read by everyone interested in the feasibility of a gold standard.

Griffith's collection of essays correctly portrays the early 1930s as a time of world economic instability. Though the rest of the world seemed to be devaluing—that is, moving off the gold standard—from this text one gathers that the people of the Netherlands simply did not want to abandon gold; even groups that would benefit the most from a devaluation did not contend

that the gold standard was undesirable. Rather, their arguments seemed purely pragmatic and somewhat apologetic, essentially professing the merit of the gold standard while acknowledging that they would be better off without it. Those people with little to gain from devaluation strongly opposed it, of course. In short, maintaining a gold standard seemed to be a politically safe, if not indeed popular, position, which helps explain why the Netherlands held on for so long.

Eventually, though, the Dutch were forced to let go. Devaluations by other countries lowered the value of the Netherlands' foreign-exchange holdings; as a result, whenever another country devalued, a speculative run on the Dutch currency would take place. Beginning in March 1935, the "gold bloc" countries started to abandon the precious metal, intensifying pressures on the remaining gold-standard bearers. After France devalued, Switzerland and then the Netherlands had little choice but to follow suit. Even though a reasonable political consensus existed to retain the gold standard, international instability overwhelmed domestic desires. In such an environment, the gold standard simply was not feasible.

The authors did not set out to make this point, however. Instead, they produced a text aimed at understanding the devaluation decision itself and the reasons it did not occur earlier. To this end the book represents a remarkable effort in reconstructing the political forces and economic conditions of the time. Unfortunately, the very narrow scope of the inquiry and the quite detailed result could easily deter most readers. This effect is regrettable, for the underlying moral of the Netherlands' story is quite relevant to some of today's debates. Despite its political popularity, the fate of the gold standard was determined by world instability.

Ian Drummond's *The Gold Standard and the International Monetary System 1900-1939* addresses the question in quite a different manner. Containing just 49 pages of text, the work is overwhelmingly brief. In addition, the style and tone of writing are similar to a personal letter's, with the end result being a book that is a quick and easy read.

Drummond divides his exposition into three time periods and a summary. The first part of his narrative covers the years from 1900 through the beginning of World War I. Presented in this section is a brief overview of the gold standard's mechanics in an essentially tranquil period.

Chapter 2 reviews the activities from 1914 through 1931. The First World War took nations off the gold standard; after the hostilities ended, many countries tried, with varying degrees of success, to get back on it. With the exception of the "gold bloc" countries that held out a few years longer, these attempts ultimately failed, particularly under the pressures of the Depression. Only 16 pages of Drummond's work are devoted to this period, and so many of the interesting developments—such as reparations payments and some hyperinflations—are ignored.

The final chapter of *The Gold Standard and* the *International Monetary System 1900-1939* charts the remnants of the gold standard during the Depression and the immediate consequences, particularly in Europe, of at least somewhat floating exchange rates.

Drummond's book may be useful for undergraduates who want a quick understanding of the actual workings of a gold standard during the prewar twentieth century. Though this monograph presents only superficial historical coverage, in certain circumstances that focus (or lack thereof) is a virtue rather than a defect.

The gold standard will no doubt look progressively more attractive as time passes and as people forget why the standard was abandoned. Drummond's book offers just a quick recapitulation of the workings and failings of gold-backed money. The story of the Netherlands, though, with its well-meaning people who would have collectively preferred the gold standard only to have their desires dashed by international instability, is worthy of an occasional recounting whenever the luster of gold grows bright.

Thomas J. Cunningham

The reviewer is an economist in the macropolicy section of the Atlanta Fed's Research Department. This review appears in a somewhat different form in the Spring 1989 Journal of Economic History.



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