THE TWIN-DEFICIT ILLUSION
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Introduction

Despite employment and income gains in the 1980s, is the United States in trouble because it has become the world's largest debtor? The common perception is that Americans have become spendthrifts, with private consumption and government deficits financed by loans from and sales of assets to foreigners. The inference commonly drawn is that future consumption will have to be cut back in order to service the nation's rapidly deteriorating net external wealth position.

So much depends on the underlying measures that it is surprising how little attention has been paid to their quality. Thousands of regressions have been run to estimate the relationship between the budget and current-account deficits. But the data are suspect because official measures of these magnitudes typically have not been adjusted for either inflation or changes in market values. This paper's main objective is to analyze the twin-deficit phenomenon using data that have been adjusted for inflation and market values.

The conventional wisdom is that there is a causal link between large U.S. fiscal deficits and current-account deficits. This observation seems confirmed by Figure 1. Such a relationship is theoretically possible if fiscal deficits raise real interest rates enough to induce a capital inflow. Nonetheless, there is considerable dispute about the historical relationship between current-account and fiscal balances. For example, the United States ran large fiscal deficits during both World Wars, but there was a current-account surplus during World War I and a current-account deficit during World War II.

FIGURE 1

NOMINAL U.S. CURRENT-ACCOUNT BALANCE,
CHANGE IN NIIP, BUDGET BALANCE RELATIVE TO GDP
(PERCENT)
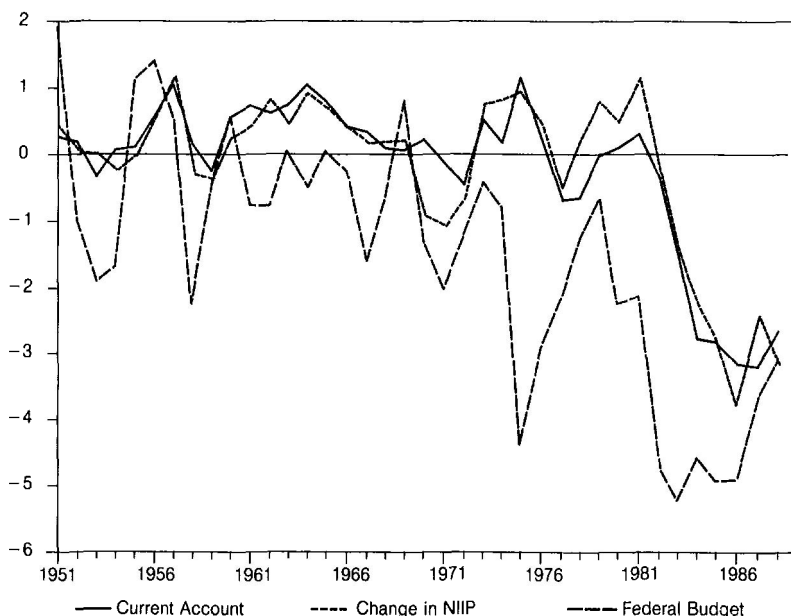
The present paper reexamines the twin-deficit relationship with
both the budget balance and the current-account balance defined as
changes in a net-asset position valued at market prices and adjusted
for inflation. Such an approach has been used by Barro (1984) and
Eisner (1986) in defining a real budget balance and by Cukierman
and Mortenson (1983) in defining a real current-account balance.
But, to our knowledge, no one has previously linked such budget
and current-account balances. In our study with consistently defined
real budget and real current-account balances, the twin-deficit associ-
ation is not found to be statistically significant for the 1954–87 period,
whereas there is a significant relationship in terms of the official
nominal magnitudes.

Foreign Trade in the National Income and Product Accounts

The net flow of international trade in goods and services in the
National Income and Product Accounts (NIPA) includes

- the value of output produced for foreigners (exports),
- less the value of inputs to U.S. output and consumption produced abroad (imports),
- plus the income from foreign factors of production owned by U.S. residents,
- less the income from factors of production owned by foreigners in the United States.

This net flow of goods and services has a strictly current-production orientation. The concept of income on which such a measure is based does not take into account changes in the market values of existing assets or international transfers. The balance-of-payments definition of the U.S. current-account balance is broadened to include unrequited transfers. But both trade and current-account balances exclude changes in the foreign-currency market values of U.S. investments abroad, changes in the U.S.-dollar value of these investments as a result of exchange-rate movements, and changes in the market values of foreign investments in the United States.

A broader definition of the trade and current-account balances is arguably appropriate when considering the impact of international capital flows on national wealth and on a nation's ability to service net foreign claims on its production. In principle, the income resulting from increasing market values of U.S. foreign investments could support a net inflow of imported goods and services without decreasing national wealth or the U.S. net external wealth position. In fact, according to our estimates, a considerable part of the decrease in the official U.S. Net International Investment Position (NIIP) in the 1980s that was associated with persisting current-account deficits may have been offset by an increase in the market values of U.S. foreign investments. Such a market-value-adjusted current-account balance will be compared with the federal budget position in statistical tests reported in this paper.

"Real Budget" and "Real Current-Account" Balances

Definitions

Conceptually, the real federal budget deficit is not the nominal deficit divided by a price index. Such a direct measure, termed the NIPA-real budget deficit, is incomplete because it does not include changes in the real market value of *stocks* of outstanding federal assets and liabilities. A NIPA-real budget deficit can occur alongside a reduction in the real net debt of the federal government as in 1979

when inflation was high. What happened was that inflation reduced the real value of the outstanding stock of government net debt by more than it increased because outlays exceeded revenues.

A *real* budget deficit is correctly measured by the increase in the *real* net debt position of the federal government. It depends not only on real flows of government expenditures and revenues but also on changes in real values of outstanding stocks of government assets and liabilities. In 1979, there was a NIPA-real federal budget deficit but, inasmuch as the real value of the outstanding net federal debt fell, the real budget position in 1979 is appropriately interpreted as a surplus.

One can define a "real current-account balance" as an analog of the real government budget balance. It is the change in the real U.S. net external wealth position.

- The change in the nominal net external wealth position is the total of the official, production-oriented current-account balance *plus* valuation changes that result from exchange-rate and asset-price changes.
- The change in the real net external wealth position is the total of deflated flows of exports, imports, and transfers, which are elements of the official current-account balance *plus* changes in the deflated market values of outstanding stocks of items included in the external wealth position.

The Link between Inflation Adjustment of the Budget and Current-Account Balances

Let us suppose that foreigners own $350 billion of short-term government securities that pay 9 percent interest a year and that annual inflation is 5 percent. Under these assumptions, the official nominal federal budget deficit would include $31.5 billion in interest payments to foreigners (.09 x $350 billion). Simply dividing these outlays by the price level, as is the NIPA standard, is misleading because it does not incorporate the decline in the real value of foreign-held federal securities resulting from inflation. The inflation-adjusted figure in terms of the previous year's price level is $13.33 billion (.04 x $350 billion/1.05). Essentially, $(.09 - .05)/1.05$ is the real interest rate at which the government borrows from foreigners, and $.05/1.05$ is the depreciation rate in the real value of the debt caused by inflation.

There is a corresponding inflation adjustment in the international accounts. In this example, the official nominal NIPA current-account balance would include a $31.5 billion debit reflecting the interest

paid to foreigners. Dividing that element of the nominal current-account by the price index, as is the common practice, yields a NIPA-real current account debit of $30 billion. This figure is misleading because it does not account for the decline in the real value of the stock of federal debt held by foreigners. Taking that decline into account, we see that the inflation-adjusted interest outlay to foreign holders of federal debt in the current-account would not be $30 billion but $13.33 billion, the same as the correct real interest outlay to foreigners in the federal budget account.

Market Value Estimates of Net External Wealth Positions

The official U.S. net external wealth (NEW) position is called the U.S. Net International Investment Position (NIIP). It is compiled by the Bureau of Economic Analysis, Department of Commerce. The official NIIP was −$532.5 billion at the end of 1988, down from −$378.3 billion a year earlier.

Despite its common interpretation as a "net-debt" position, the NIIP includes not only debt but also equity holdings of real estate and businesses, plus holdings of foreign currencies and gold. The accuracy and meaning of the official measure is questionable. Portfolio investments are valued at market, but nonsecuritized debt and direct investments are valued at book value. Gold is valued at an arbitrary official $42.22 an ounce.

One may question whether gold, which is held in the United States, should be included as an international asset. If gold is included, about $100 billion would be added by valuing it at market prices as of the end of 1988. Regarding other items in the official NIIP, ownership crosses national borders. For those items, market valuation would cut roughly $50 billion from the book value of U.S. bank loans to foreigners, according to both Shearson-Lehman and to Salomon Brothers, but it would add perhaps $500 billion to the U.S. net foreign direct-investment position at the end of 1988.

Revaluations of direct investment positions to market were based on (1) investment-goods deflators, (2) movements in foreign and U.S. stock market indexes adjusted for exchange-rate movements, and (3) capitalization of direct-investment earnings. On balance, revaluations to market add hundreds of billions of dollars to the official U.S. NIIP.

Deflating the Twin-Deficit Statistics

Table 1 presents key current-account and federal-budget balance data as averages of annual data for the 1950s, 1960s, 1970s, and 1980s

TABLE 1

U.S. FEDERAL-BUDGET AND CURRENT-ACCOUNT BALANCES: NOMINAL AND REAL:
ANNUAL AVERAGES
(BILLIONS OF DOLLARS)

| | (1) Nominal Federal Budget Balance | (2) Nominal Current-Account Balance | (3) Change in Nominal NIIP | (4) Real Federal Budget Balance | 1982 Dollars | | | |
					(5) Real NIIP	(6) Change in Real NEW 1	(7) Change in Real NEW 2	(8) Real NEW 3
1951–60	−0.2	1.1	0.7	11.8	0.5	2.1	7.4	10.2
1961–70	−3.6	3.3	1.8	9.2	2.0	6.6	2.7	6.8
1971–80	−33.2	−0.5	4.8	0.8	−1.5	22.1	6.3	−6.1
1981–87	−160.1	−76.7	−69.2	−133.7	−63.3	−58.5	−23.7	−1.4
1951–87	−43.8	−13.5	−11.1	−22.1	−11.7	−2.7	−0.04	2.7

TABLE 1 (cont.)

ANNUAL AVERAGES RELATIVE TO NOMINAL OR REAL GDP
(PERCENT)

| | Nominal Federal Budget Balance | Nominal Current-Account Balance | Change in Nominal NIIP | Real Federal Budget Balance | 1982 Dollars | | | |
| | | | | | Change in | | | |
					Real NIIP	Real NEW 1	Real NEW 2	Real NEW 3
1951–60	−0.06	0.26	0.17	0.79	0.03	0.14	0.50	0.69
1961–70	−0.48	0.44	0.24	0.44	0.10	0.31	0.13	0.32
1971–80	−1.76	−0.30	0.27	0.28	−0.05	0.78	0.22	−0.22
1981–87	−4.30	−2.08	−1.87	−3.90	−1.84	−1.70	−0.69	−0.04
1951–87	−2.74	−0.90	−0.74	−0.85	−0.49	−0.11	−0.03	0.11

NOTES: Budget data and period averages begin in 1954, not 1951.
Dollar figures are simple averages over the periods indicated. The normalization to GDP was effected by dividing the period-average dollar figures by the average nominal or real GDP for the periods indicated.
NEW 1: Revaluations based on investment deflators (Eisner and Pieper).
NEW 2: Direct investment valued to market via U.S. and foreign stock-price indices and the foreign-exchange rate of the dollar.
NEW 3: Revaluations based on discounted earnings on direct investment.

through 1987. The large official current-account deficits in the 1980s in column 2 are reflected in large average changes in the official nominal NIIP in column 3. On the basis of 10-year averages, there was no apparent association between the nominal budget balance in column 1 and the nominal current-account balance in column 2, either in absolute terms or relative to GDP in the period before 1980. However, both budget and current-account deficits were very large for 1981–87.

Column 4 shows the real budget-balance estimates of Eisner and Pieper (1988). Because of inflation, nominal budget deficits (column 1) were translated into real budget surpluses in the 1950s through the 1970s. In the 1980s nominal deficits averaged over $25 billion more than real deficits, but even the real deficits appear large in absolute terms and relative to gross domestic product (GDP).

Columns 5–8 show changes in the various measures of the real U.S. NEW position. The decline in the official NIIP (column 5) and, to a lesser extent, the NEW position based on investment-goods deflators (column 6) were large on average in the 1980s and, thus, were associated with the large real budget deficits calculated by Eisner and Pieper. The average decline, however, in the real NEW position estimated on the basis of exchange-rate-adjusted comparative stock-market indices (column 7) was less than half as large as either of the former measures in the 1980s. There was essentially no decline in the NEW position estimated on the basis of discounted investment income (column 8).

Compared with the strong relation between the nominal current-account deficit and the budget deficit in the 1980s, the association in real terms is muted with respect to all of the inflation-adjusted market measures. Figure 2 presents annual real federal budget and current-account data relative to GDP, as well as the averages that appear in Table 1. The next section examines regression analysis of the twin-deficit relation in terms of these annual data.

Is There a Real Twin-Deficit Relation?

The foundations of the twin-deficit relationship have been questioned by a number of economists including Johnson (1984), Darby (1987), Niskanen (1988), and Evans (1985, 1986, 1988a, 1988b). They found no systematic association in the U.S. historical record between budget deficits and either interest rates or current-account deficits in nominal terms.

Our approach is quite different. We focus on the study by Roubini (1988)—one of the many studies that has found a significant twin-

FIGURE 2

BUDGET AND CURRENT-ACCOUNT BALANCES
RELATIVE TO GDP
(PERCENT)

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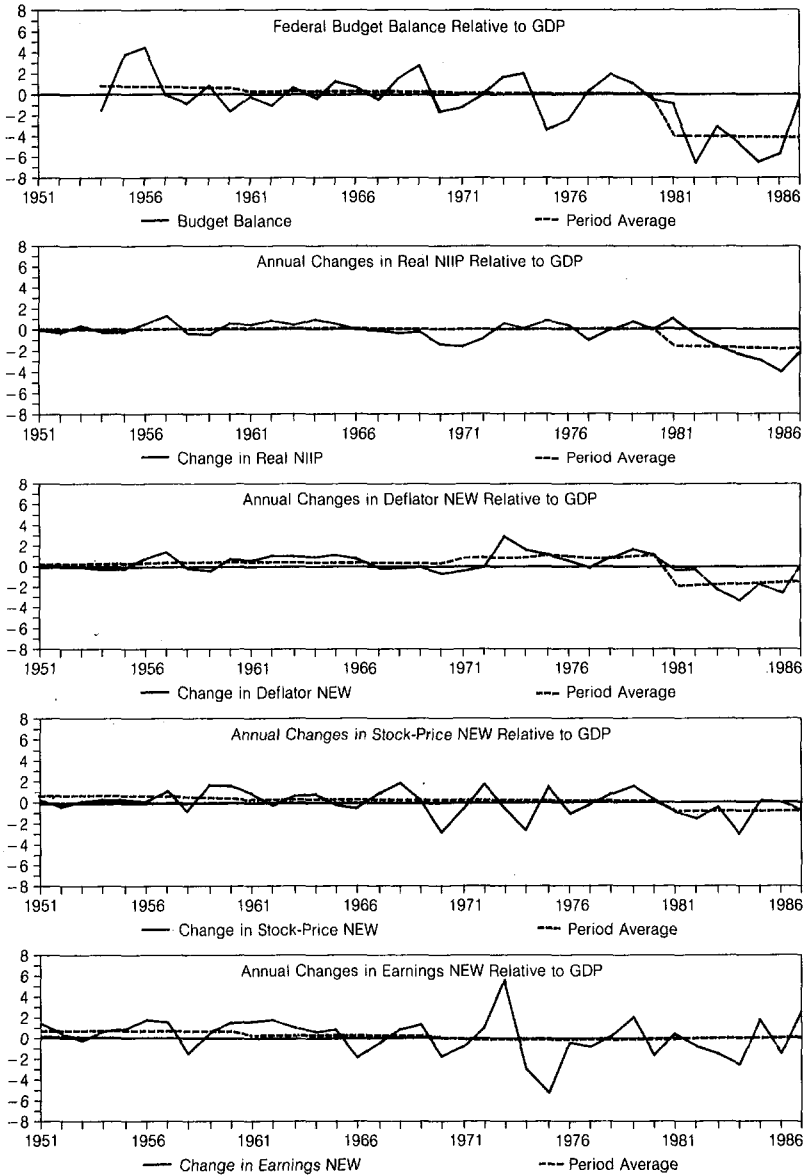
deficit association. He examines the relationship between current-account balances and both the general-government budget position and domestic investment with all variables expressed in NIPA-real terms and normalized with respect to GDP. His empirical results for a number of OECD countries, including the United States, generally show that both budget deficits and domestic investment were highly significant in explaining current-account balances.

The fact that his data were not adjusted for inflation and market values offered an opportunity to plug corrected measures into his statistical specification. Our purpose is to see whether the twin-deficit relationship Roubini found for NIPA-real magnitudes for the United States would hold up after adjusting the statistics for the effects of inflation and changing market values on stocks of outstanding net government debt and the NEW position.

The Variables

Several measures of the federal fiscal position are used in the estimations. In replicating Roubini's equation, the general government deficit was used. In equations in which the ratio of the nominal current-account balance to nominal GDP is the dependent variable, the official NIPA federal budget deficit was used. In equations in which the ratio of the change in the real NIIP to real GDP is the dependent variable, the change in gross publicly held Treasury debt adjusted for inflation was specified. It was not adjusted for changes in the market prices of outstanding issues and, thus, can be likened to an "official" real deficit in the sense that it is based on the published official face value of Treasury debt. In equations in which the estimated "real current account balances" to real GDP are the dependent variables, the Eisner-Pieper federal budget-deficit data were used.[1] All of these data are presented in Appendix A. As in Roubini's work, the measure of investment was gross private domestic investment (fixed investment plus inventory change)—nominal or real consistent with the dependent variable.

The Estimations

In order for us to compare these new results with Roubini's in terms of both nominal and real variables, estimates were made over both the sample period he used, 1961–85, and over the entire period for which data are available, 1954–87. Symbols used are listed in

[1]Consistent with the wealth orientation of the present study, an implicit deflator, derived from the ratio of the constant-cost to current-cost stock of tangible capital found in the October 1989 *Survey of Current Business*, was substituted for the GNP deflator that Eisner and Pieper used to deflate their nominal federal asset and liability data.

Table 2, and regression results appear in Table 3 for 1961–85 and Table 4 for 1954–87. Equation (1) is Roubini's. Equation (2) adjusts these estimates for serial correlation. The estimated coefficient of the general government budget deficit variable is insignificant in equation (2). However, when the *federal* deficit ratio is substituted for the general government deficit ratio, the estimated coefficients are significant in equation (3). Equations (8) and (9), respectively, present estimates for 1954–80 and 1954–87. In each period, given the gross private domestic investment ratio, there was a significant twin-deficit relationship between the nominal current-account and the nominal federal budget ratios.

Comparisons of equations (3) and (4) in Table 2 and of equations (9) and (10) in Table 3 reveal effects of inflation adjustment (but not market-value adjustment) on the twin-deficit relation. The real current account is measured by the change in the deflated official NIIP; the real federal budget balance, by the change in the deflated official stock of federal debt. Inflation adjustment uniformly *reduced* the estimated effects of investment and the budget deficit on the current account. Nonetheless, the coefficients of the budget balance were estimated to be significant. Based on these official statistics, the twin-deficit relation was estimated to be significant even in inflation-adjusted terms.

TABLE 2

DEFINITIONS OF SYMBOLS USED

X_1 Nominal current-account balance (sum of exports, imports, and transfers) divided by nominal GDP.

X_2 Change in real NIIP divided by real GDP.

X_3 Change in real Deflators NEW divided by real GDP.

X_4 Change in real Stock-Price NEW divided by real GDP.

X_5 Change in real Earnings NEW divided by real GDP.

Y_1 Nominal gross private domestic investment (fixed investment plus inventory change) divided by nominal GDP.

Y_2 Real gross private domestic investment (fixed investment plus inventory change) divided by real GDP.

Z_0 General-government deficit divided by nominal GDP.

Z_1 NIPA-based federal deficit divided by nominal GDP.

Z_2 Inflation-adjusted change in official publicly held Treasury debt valued at par divided by real GDP.

Z_3 Real federal deficit (Eisner-Pieper) divided by real GDP.

TABLE 3

NOMINAL REGRESSION RESULTS, 1961–85

Dependent Variable	Constant	Investment	Deficit	Rho	R^2 (Adjusted)	D.W.
(1) X_1	Not Reported	$-0.51\ Y_1$ (-3.06)	$-0.61\ Z_0$ (-4.00)	OLS	0.42	0.86
(2) X_1	0.05 (1.72)	$-0.27\ Y_1$ (-2.24)	$-0.09\ Z_0$ (-0.64)	0.93 (15.79)	0.69	1.40
(3) X_1	0.07 (3.35)	$-0.41\ Y_1$ (-3.50)	$-0.32\ Z_1$ (-2.63)	0.71 (5.19)	0.71	1.91

REAL REGRESSION RESULTS, 1961–85

Dependent Variable	Constant	Investment	Deficit	Rho	R^2 (Adjusted)	D.W.
(4) X_2	0.04 (1.44)	$-0.21\ Y_2$ (-1.55)	$-0.20\ Z_2$ (-2.05)	0.63 (4.99)	0.52	1.76
(5) X_3	0.004 (0.15)	$-0.02\ Y_2$ (-0.15)	$-0.05\ Z_3$ (-0.52)	0.68 (4.75)	0.45	1.70
(6) X_4	0.03 (0.75)	$-0.16\ Y_2$ (-0.75)	$-0.02\ Z_3$ (-0.20)	OLS	-0.06	2.03
(7) X_5	-0.09 (-1.61)	$0.56\ Y_2$ (1.65)	$-0.10\ Z_3$ (-0.53)	OLS	0.08	1.89

NOTE: The ratios are in parentheses. For a one-tail test, t ratios more than 1.72 are significant at the 5 percent level.

TABLE 4

Nominal Regression Results, 1954–80

Dependent Variable	Constant	Investment	Deficit	Rho	R^2 (Adjusted)	D.W.
(8) X_1	0.04 (3.68)	$-0.23\,Y_1$ (−3.37)	$-0.16\,Z_1$ (−2.42)	OLS	0.30	1.43
(9) X_1	0.05 (2.52)	$-0.34\,Y_1$ (−3.11)	$-0.27\,Z_1$ (−2.44)	0.90 (13.62)	0.81	1.91

Real Regression Results, 1954–87

Dependent Variable	Constant	Investment	Deficit	Rho	R^2 (Adjusted)	D.W.
(10) X_2	0.02 (1.28)	$-0.15\ Y_2$ (−1.46)	$-0.22\,Z_2$ (−2.76)	0.67 (5.32)	0.64	1.90
(11) X_3	0.001 (0.07)	$-0.002\,Y_2$ (−0.01)	$-0.12\,Z_3$ (−1.61)	0.57 (4.09)	0.44	1.90
(12) X_4	0.03 (1.07)	$-0.18\ Y_2$ (−1.04)	$-0.02\,Z_3$ (−0.21)	OLS	−0.03	1.92
(13) X_5	−0.08 (−1.61)	$0.49\ Y_2$ (1.89)	$-0.14\,Z_3$ (−1.05)	OLS	0.08	1.88

NOTE: The ratios are in parentheses. For a one-tail test, t ratios more than 1.70 are statistically significant at the 5 percent level.

Finally and most importantly, estimates of the twin-deficit relation with assets valued to market and adjusted for inflation are reported in equations (5)–(7) in Table 3 and equations (11)–(13) in Table 4. In none of these equations is the coefficient of either investment or the budget deficit significant. There are certainly econometric issues that can be raised regarding the way current-account deficits and budget deficits have been related to one another in the empirical literature. Nevertheless, in the genre of this literature, these results have identified no significant relation between the twin deficits when the variables are expressed in inflation-adjusted market-value terms.

Conclusion

The empirical results reported in this paper show no systematic association between the current-account and budget balances when both are adjusted for inflation and expressed in market-value terms— the adjustments that are relevant for evaluating whether the apparent twin-deficit relation is real or illusory. Using the data adjusted for both inflation and market-value changes, we found no significant link between fiscal and current-account balances during 1954–87.

Part of the apparent relation between the U.S. nominal budget and current-account deficits, which has received so much attention in recent years, is simply the result of money illusion: The nominal figures do not account for the effects of U.S. inflation on either the budget balance or the change in the U.S. NEW position. Another part is the result of an accounting illusion: The official measures of the budget and current-account balances do not account for the changed market values of the net U.S. federal debt or major elements of the U.S. NEW position.

These findings in no way show that either budget or current-account deficits are unimportant or unexplainable. Rather, our results indicate that the simplistic coupling of a budget deficit with a current-account deficit does not hold up in terms of inflation-adjusted market values of these measures.

Appendix A: Data Series

This Appendix contains the data on the changes in the real U.S. Net International Investment Position (NIIP) and in the various market-valued estimates of U.S. net external wealth (NEW), together with the budget-balance data (divided by real U.S. gross domestic product) used in the regression analysis conducted by the authors.

TABLE A 1

REAL CURRENT-ACCOUNT AND FEDERAL-BUDGET
BALANCES RELATIVE TO GDP
(PERCENT)

| | Change in | | | |
	Real NIIP	Real Stock-Price NEW	Real Earnings NEW	Real Deflators NEW	Budget Balance
1951	0.01	0.21	1.63	0.19	—
1952	0.15	−0.17	0.52	0.002	—
1953	−0.02	0.06	−0.13	−0.02	—
1954	−0.28	0.23	0.48	−0.27	−1.38
1955	−0.25	0.38	0.80	−0.21	3.86
1956	0.41	0.25	1.72	0.57	4.48
1957	1.08	1.13	1.46	1.22	−0.15
1958	−0.28	−0.64	−1.50	−0.20	−0.74
1959	−0.43	1.76	0.47	−0.38	0.83
1960	0.26	1.59	1.45	0.42	−1.37
1961	0.38	0.96	1.60	0.40	−0.18
1962	0.77	−0.08	1.79	0.81	−0.88
1963	0.39	0.57	1.23	0.68	0.70
1964	0.85	0.76	0.78	0.74	−0.03
1965	0.64	−0.14	0.74	0.92	1.17
1966	0.21	−0.35	−1.83	0.73	0.78
1967	−0.07	0.85	−0.46	−0.06	−0.29
1968	−0.25	1.84	0.77	−0.15	1.54
1969	−0.19	0.29	1.31	0.10	2.66
1970	−1.25	−2.86	−1.82	−0.62	−1.53
1971	−1.42	−0.68	−1.06	−0.53	−1.17
1972	−0.92	1.67	1.13	−0.11	0.03
1973	0.57	−0.73	5.85	2.69	1.63
1974	0.34	−2.54	−2.92	1.50	1.90
1975	0.81	1.42	−5.15	1.00	−3.46
1976	0.30	−0.92	−0.22	0.41	−2.46
1977	−0.86	−0.04	−0.69	−0.06	0.34
1978	−0.18	0.92	0.23	0.59	2.00
1979	0.48	1.53	2.01	1.36	1.20
1980	0.14	0.24	−1.60	0.87	−0.21
1981	0.89	−0.72	0.38	−0.45	−0.90
1982	−0.17	−1.18	−0.67	−0.65	−6.56
1983	−1.53	−0.34	−1.43	−2.50	−3.16
1984	−2.40	−2.88	−2.39	−3.48	−4.57
1985	−2.94	0.40	1.95	−2.01	−6.44
1986	−3.84	0.10	−1.23	−2.68	−5.75
1987	−2.26	−0.37	2.71	−0.09	−0.01

TABLE A 2

REAL U.S. NIIP AND STOCK-PRICE-BASED U.S. NEW
(BILLIONS OF 1982 DOLLARS)

	NIIP	Original Stock-Price NEW	Revised Stock-Price NEW
1970	117.9	199.3	194.1
1971	83.1	182.9	186.9
1972	59.3	226.0	232.6
1973	74.7	206.2	225.3
1974	83.9	137.7	159.2
1975	105.5	175.6	185.4
1976	113.9	150.0	154.6
1977	88.7	148.8	159.8
1978	83.2	177.3	203.2
1979	98.1	225.1	249.9
1980	102.7	244.7	257.4
1981	131.0	245.2	234.4
1982	125.7	229.3	197.7
1983	75.9	239.9	186.6
1984	− 7.2	155.7	87.5
1985	− 112.4	174.1	101.6
1986	− 254.8	161.4	105.5
1987	− 334.8	83.2	91.2

NOTE: The revised data on this page replace the stock-price-adjusted net-foreign-asset data found in Ulan and Dewald (1989, p. 383). The authors' original estimates were made under the assumption that the Department of Commerce's official figures included exchange-rate adjustment of the book values of U.S. direct investment abroad. In fact, Commerce makes no adjustments to the book values of either U.S. direct investment abroad or foreign direct investment here in the U.S. NIIP. As shown, the differences between the original and corrected series have at times been fairly substantial in absolute value but very small in the context of a national tangible wealth of about $15 trillion.

Compared to the original series, the revised stock-price-based NEW estimates are somewhat higher in the 1970s and lower in the 1980s. Nevertheless, over the whole period, both the original and revised estimates are much higher than the real official NIIP, the main finding in the authors' earlier work.

Appendix B: Data Sources

The data used in this study were those pertaining to the following:

● U.S. assets abroad and foreign assets in the United States found in *Historical Statistics of the United States: Colonial Times to*

1970; *Survey of Current Business* (August 1984); and Scholl (1986, 1987, 1988).

- Nominal U.S. current account balances and earnings/price ratios found in the 1988 and 1989 *Economic Report of the President and Annual Report of the Council of Economic Advisers.*
- Book value of U.S. direct investment abroad by country since 1950, found in U.S. Department of Commerce, Bureau of Economic Analysis (1982, 1986); *Survey of Current Business* (August 1986); Scholl (1987); and Bach (1988).
- Price indices for stocks traded on the New York Stock Exchange and major stock exchanges in other industrial countries for which country-specific data on U.S. direct investment are found in the publications cited above, taken from *International Financial Statistics* data tapes 11 and 31 March and 13 May 1988, and the August 1988 *International Financial Statistics.*
- Year-end exchange rates for the dollar taken from *International Financial Statistics* data tapes, 31 January 1989.
- Data on government capital stock found in *Survey of Current Business* (October 1989).
- Deflator for fixed reproducible tangible wealth derived on the basis of data found in *Survey of Current Business* (October 1989).
- Earnings on foreign direct investment found in *Survey of Current Business* (March 1953, p. 8; June 1956, p. 24; June 1960, p. 14; June 1961, p. 12; and June 1988, pp. 40–41). Since data for years prior to 1960 refer to repatriated earnings only, for prior years, reinvested earnings found in U.S. Department of Commerce, Bureau of Economic Analysis (1982, pp. 55–64; 1984, p. 8), were added to the *Survey of Current Business* earnings data.
- Book values of foreign direct investment in the United States found in U.S. Department of Commerce, Bureau of Economic Analysis (1984, pp. 2–3), and Scholl (1988, p. 78).
- Year-end stocks of residential structures and nonresidential plant and equipment at current cost, taken from the April 1989 *Balance Sheets for the U.S. Economy 1949–88*, published by the Board of Governors of the Federal Reserve System.
- Nominal and real reproducible tangible wealth in the United States, found in *Survey of Current Business* (October 1989).
- Data on investment-deflator adjusted values of U.S. investment abroad and foreign investment in the United States taken from Eisner and Pieper (1988).

- Government asset figures taken from Eisner (1986); updated and revised data relating to federal financial assets and liabilities furnished to the authors by Paul Pieper; and updated and revised data relating to federal, state, and local inventories furnished to the authors by John C. Musgrave.
- U.S. gold holdings prior to 1970 found in *Historical Statistics of the United States Colonial Times to 1970*.
- U.S. GNP and GDP real and nominal with deflators, gross private domestic investment, real and nominal, and NIPA federal budget deficits taken from Data Resources Inc., U.S. Central databank, 4 May 1989.
- Data on year-end gross federal debt held by the public furnished by Congressional Budget Office. The data are interpolations of CBO end-of-fiscal-year data.
- Data used by Noriel Roubini furnished by that author on diskette.

Requests for the data should include a high-density diskette and return mailer sent to the authors at the following address: EB/PAS, Room 3425, U.S. Department of State, Washington, DC 20520.

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