Would Lower Federal Deficits Increase U.S. Farm Exports?

Michael T. Belongia and Courtenay C. Stone

MANY farm policy experts believe that U.S. agricultural exports would be increased significantly if federal budget deficits were reduced. One such expert, for example, has commented that "a more nearly balanced federal budget probably would do as much as anything to improve our agricultural export performance."[1] Other analysts also have predicted that the farm outlook will remain bleak until this nation develops "a credible plan to reduce the enormous Federal budget deficits."[2] This view is so pervasive that it might now be considered the conventional wisdom on the subject.[3]

If this view is valid, it has important implications for domestic farm policy legislation, including the pending farm bill.[4] If federal budget deficits have seriously reduced farm exports and, consequently, real farm income, then legislators should focus primarily on reducing the deficit to revive farm exports and income; in this case, current commodity programs may need little fundamental change once the deficit has been reduced. If budget deficits have not contributed materially to the decline in farm exports, however, then focusing attention on deficit reduction measures may divert attention from more fundamental changes that might be required in farm commodity programs. The purpose of this article is to describe the theoretical links between federal budget deficits and U.S. farm exports and to examine the empirical evidence on these links.

THE FARM EXPORT PROBLEM

singled out as a strong, perhaps the primary, suspect in attempts to explain why farm exports have declined so sharply in recent years. A *prima facie* case can be made for the deficit explanation by simply looking at the recent relationship between exports and the deficit; this comparison is shown in chart 1 for semiannual data since 1973.

If we look only at the past four years, we see that nominal farm exports declined from 1981 through 1983, rose marginally last year, and have fallen again through early 1985. During this same period, federal deficits, as measured by the national income accounts, skyrocketed, rising from $64 billion in 1981 to $176 billion in 1984. The association between rising deficits and falling exports appears to be obvious.

Yet, when the entire period is examined, this conclusion is not so obvious. Deficits were rising and falling from 1973 (when it was only $6 billion) to 1981. This period was one of generally rising farm exports. Thus, the view that rising deficits adversely affect exports is one that seems to be based primarily on evidence from the most recent period. Such a narrow focus necessarily raises questions about the generality of the presumed relationship and the likely effect of policies designed to exploit the relationship.

To get a better perspective on the relationship between deficits and farm exports, we must focus on the

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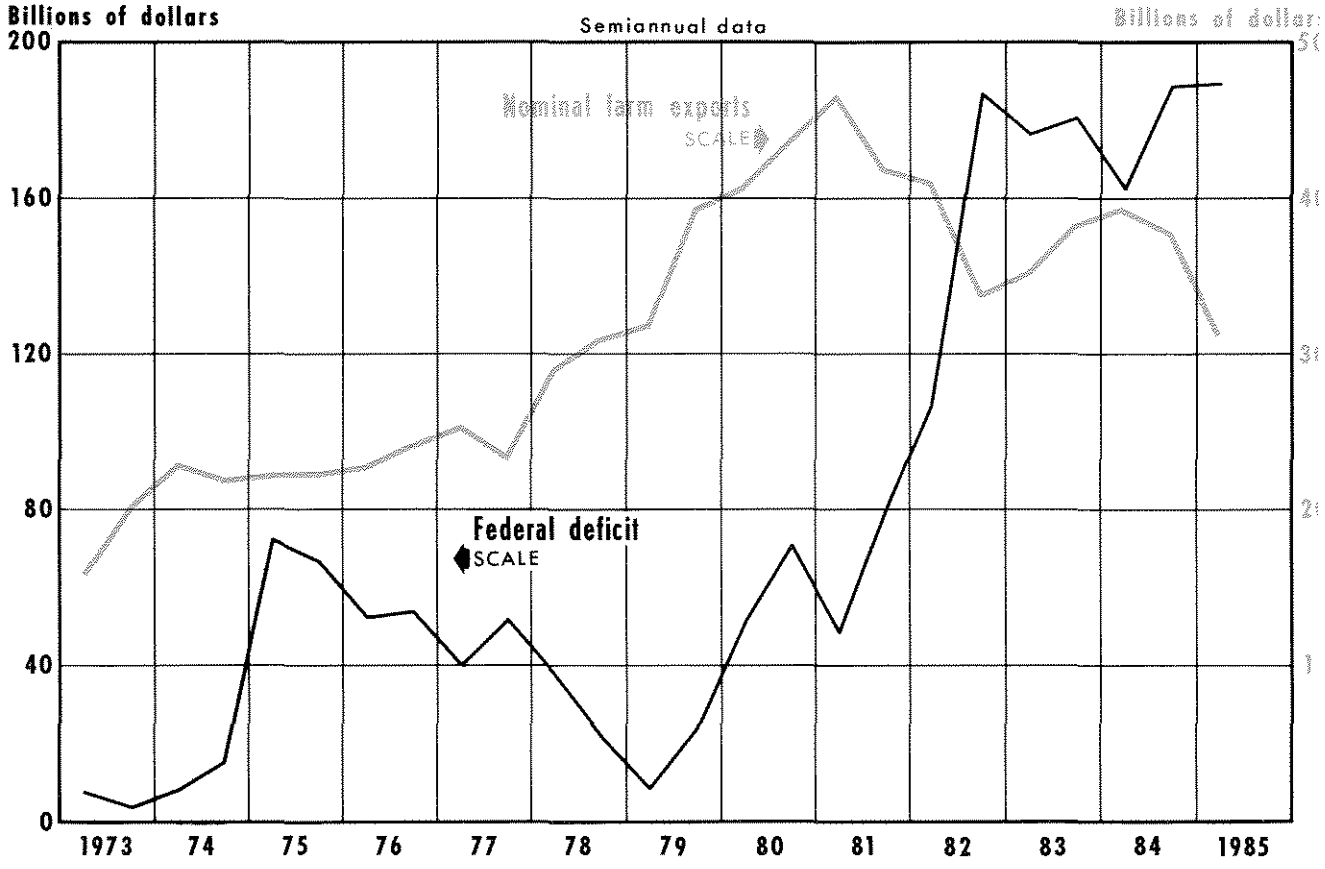
[1]Schuh (1984), p. 246.

[2]Duncan and Drabenstott (1985).

[3]Of course, this view is not confined solely to farm policy experts. It is held by a large number, perhaps even the vast majority, of policy analysts. For similar statements about the effect of deficits on exports, see Clark (1985), Downs (1985), Kraft (1985) and Modigliani (1985).

[4]The omnibus farm legislation currently in effect is a four-year bill that was passed in 1981. Congress is now debating the issues encompassed by a new four-year bill, renewal of existing legislation, or returning to the "permanent" legislation of the 1930s and 1940s that covers most major commodities.

Chart 1
Deficit and Farm Exports



theoretical relationships that tie them together and the empirical support for these underlying theories.

THE LINKS IN THE DEFICIT-FARM EXPORT CHAIN

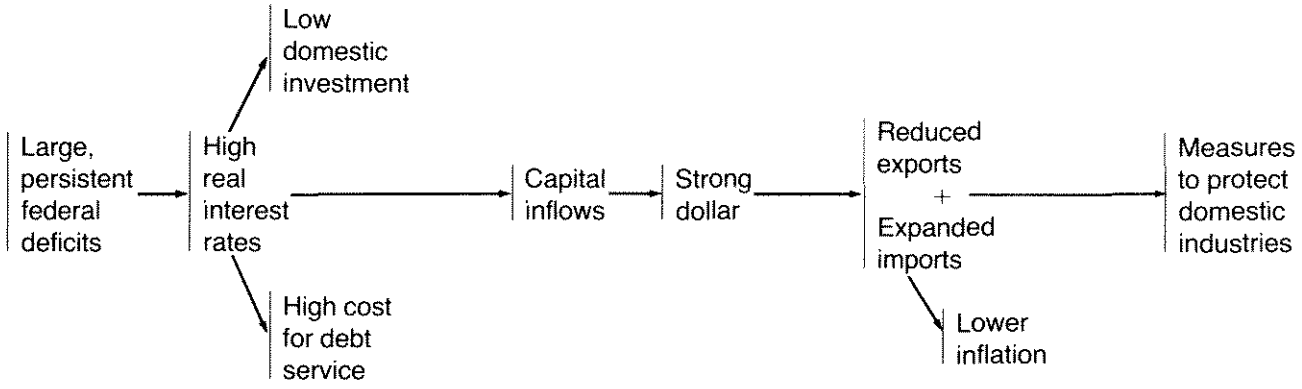
The conventional view of the links between deficits and farm exports is shown in figure 1. In this framework, the problems of reduced exports, expanded imports and political measures promoting protection for domestic industries can be traced backward, step-by-step, to their source: large, persistent federal budget deficits. An examination of figure 1 shows that there are at least three key economic relationships that must exist for this conventional view to be valid.

First, other things unchanged, deficits must be related systematically to real interest rates (interest rates adjusted for expected inflation); specifically, highe deficits must raise real interest rates and lower deficit must reduce them. Second, real interest rates must b related systematically to the real foreign exchang value of the dollar (the dollar's value after adjusting fc differences in inflation between the United States an foreign countries); higher real rates must raise th dollar's real value and lower real rates must reduce it Third, the real foreign exchange value of the dolla must be related systematically to real agricultural ex ports (agricultural export receipts adjusted for move ments in the general price level); higher real exchang rates must reduce real farm exports and lower ex change rates must increase them. The conclusion tha

[5]More correctly, the second link refers to the impact of higher re interest rates in the United States vis-a-vis those in other countrie This is explained later in this article.

Figure 1

A Schematic View of The Theoretical Linkages Between Deficits and Farm Exports



SOURCE: Dobson (1984), p. 49.

lower federal deficits will increase farm exports by reducing real rates of interest and, thus, the real foreign exchange rate of the dollar, relies on the validity of these links. We analyze these links in turn in the following sections.

LINK #1: WOULD LOWER DEFICITS REDUCE REAL INTEREST RATES?

Choosing Appropriate Deficit and Interest Rate Measures

One basic problem with trying to discern the relationship between deficits and interest rates is that the measures we observe must be "adjusted," both to eliminate potentially confounding influences and to focus the analysis on those measures that are emphasized by the underlying economic theory. The deficit measure can be adjusted in a variety of ways. Three commonly used procedures are: (1) to adjust for the impact of inflation by using a real deficit measure; (2) to adjust for the size of the economy by dividing the deficit by some measure of spending or saving; and (3) to remove the business cycle influences on the deficit.

Interest rates also must be adjusted appropriately if we are to capture the deficit's influence on them. Market interest rates — the ones that we see quoted every day — can be thought of as the sum of two basic components: the expected inflation rate and the expected (or *ex ante*) real rate of interest.[6] Changes in the deficit per se should have no effect on the expected rate of inflation unless the Federal Reserve is expected to monetize the deficit (that is, increase its purchases of government bonds).[7] Since changes in the expected rate of inflation, however, cause nominal interest rates to change and obscure the impact of changes in the deficit, we must remove the influence of changes in inflation expectations; we must focus on the deficit's impact on the expected real rate of interest.

The Conventional View of the Deficit's Impact on the Real Rate of Interest

The view that larger deficits increase the expected real rate of interest is based on the validity of the "interest-rate crowding out" phenomenon. Interest-rate crowding out is demonstrated graphically in

[6]For discussions of the differences between nominal and real interest rates and between *ex ante* and *ex post* interest rate measures, see Santoni and Stone (1981a, 1981b and 1982); for an analysis of the problems associated with attempts to measure real interest rates, see Brown and Santoni (1981).

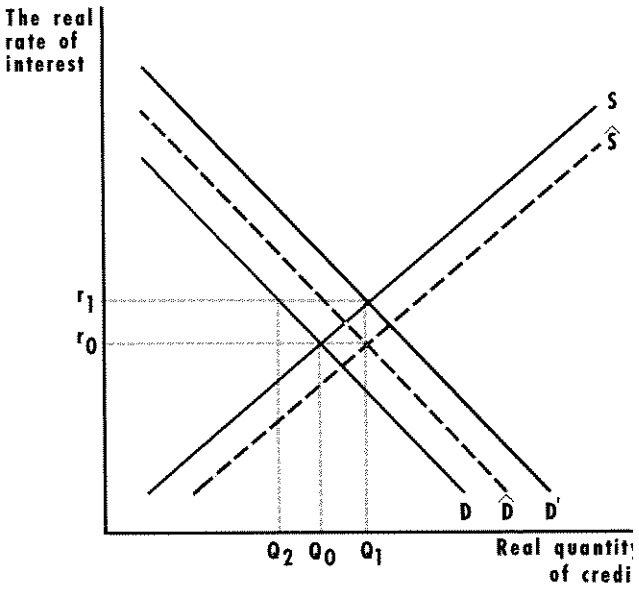
[7]For evidence that larger deficits per se are not associated with faster inflation, see Protopapadakis and Siegel (1984) and Weintraub (1981).

figure 2, which depicts the demand for and supply of real resources allocated through credit markets. The demand curve, labeled D, is the demand for resources by would-be borrowers: consumers, private firms and, of course, the government. The supply curve, labeled S, represents the amount of current saving that would-be lenders (savers) are willing to provide. The price that influences these borrowing and lending decisions separately, and that is determined jointly by the interactions of all borrowers and lenders, is the real rate of interest.

Using figure 2, it is easy to show how a larger deficit could increase the real rate of interest. If all other things remain the same, a larger deficit increases the demand in the credit market to D' and results in a higher price of credit as the real rate of interest rises to r_1. The additional resources that the government obtains come partly from additional saving (for example, people reduce their consumption) and partly from reductions in non-government borrowing (for example, private investment declines). The larger deficit and the resulting higher real interest rate have thus crowded out, or reduced, private sector consumption and investment.

Of course, the extent to which the real rate of interest actually increases under the conventional view depends on the specific slopes of the demand and supply curves; the flatter are the demand and supply curves, the smaller the rise in the real rate of interest.

Figure 2
Comparison of Deficit's Impact on Interest Rates



An Alternative Theoretical View of the Impact of Deficits

Interest-rate crowding out, as depicted in figure 2, is predicated on the view that increases in the deficit per se have little effect on the supply of or the demand for credit by consumers and private firms. Instead, consumers and private firms respond by moving along their unchanged demand and supply curves in response to changes in the real rate of interest produced by the increased government deficit.

An alternative view of how people respond to changes in government deficits suggests that the real rate of interest is essentially unaffected by government deficits.[8] This view states that people see deficits as implied taxes that eventually must be imposed o their future incomes to repay the larger governmen obligations. Thus, larger deficits today are equate with larger future taxes and reduced future after-ta incomes. As a result, an increase in the deficit reduce people's permanent incomes; this, in turn, reduce the private (and, thus, the total) demand for credit (t $\hat{D}$), while increasing private saving and, thus, the sup ply of credit (to $\hat{S}$). As shown in figure 2, although defi cits crowd out private investment and consumption they have no appreciable impact on the real rate o interest, which remains unchanged at r_0. Th crowding-out is direct; it does not take place throug increased real interest rates.

Deficits and Expected Real Interest Rates: Some Casual Evidence

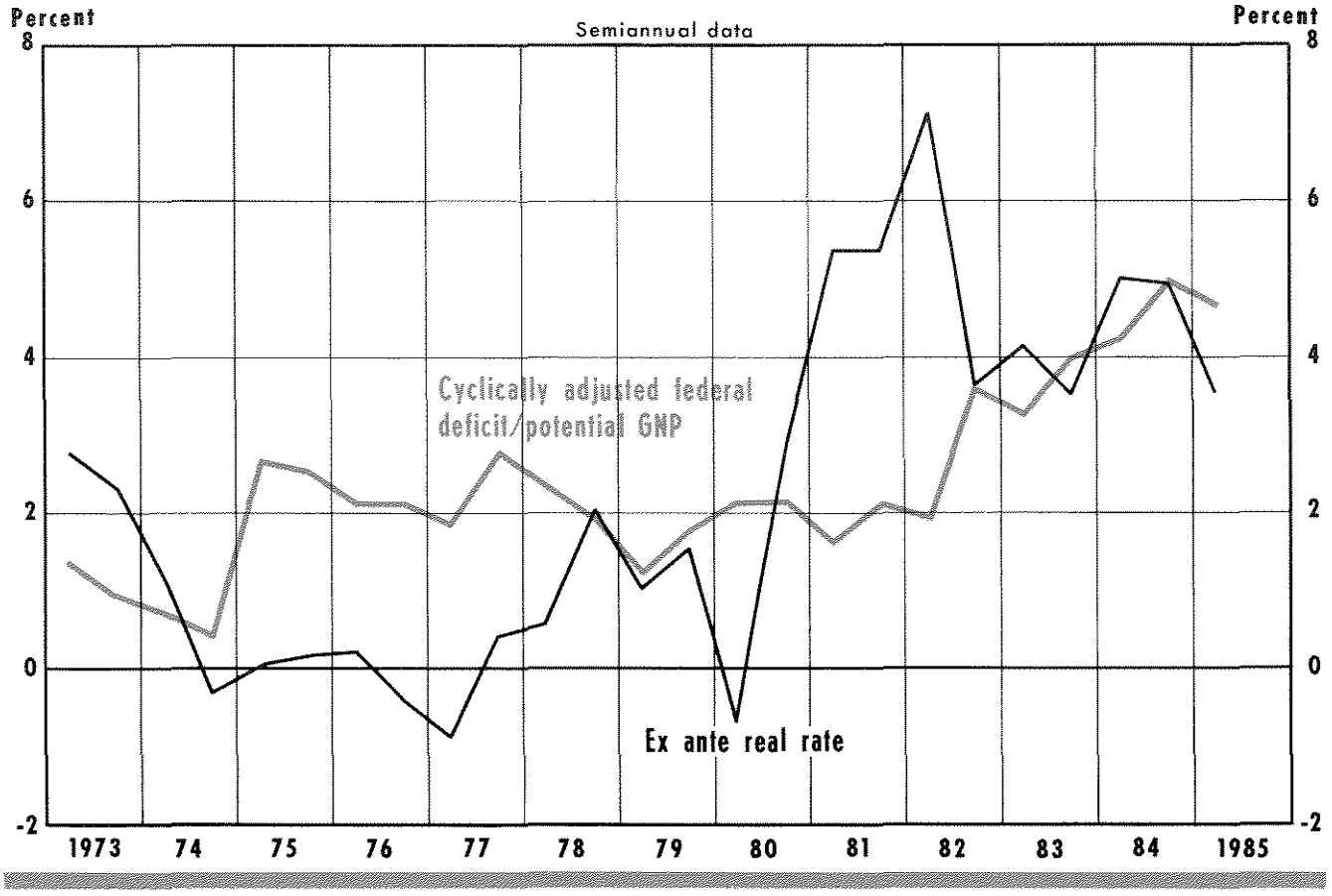
The conventional view suggests that, other thing the same, larger deficits are associated with highe expected real interest rates; the alternative view sug gests that they are not.

Chart 2 displays the behavior of one adjusted defici measure and one measure of the expected real inter est rate that, according to conventional theory, is in fluenced by federal deficits. The deficit measure use is the real cyclically adjusted deficit divided by poten

[8]This view has been popularized by Barro (1974) and Seater (1982), among others. For a recent discussion of the conventional and alternative theoretical relationships between deficits and interest rates, see Rasche (1985) and Tatom (1985); for recent evidence supporting this alternative view, see Kormendi (1983) and Protopapadakis and Siegel (1984).

Chart 2

Deficit and Ex Ante Real Interest Rate



tial real gross national product (GNP).[9] The expected real interest rate measure is obtained by subtracting six-month inflation forecasts from six-month interest rates at the time the inflation forecasts were made.[10]

An examination of chart 2 provides some evidence that the real interest rate does not respond to changes in the federal deficit in the way that is generally expected. For example, average *ex ante* real interest rates were much higher in 1973–74 than they were in 1975–77, even though the federal deficit measure was about twice as high in the later years than it was in the earlier years. Similarly, the expected real rate rose spectacularly from early 1980 to early 1982 when the deficit measure was virtually unchanged; since then, the real rate has declined considerably, yet the deficit has climbed substantially.

Chart 3 summarizes the relationship between the deficit and the real interest rate in an alternative fashion. It is a scatter-diagram of the associated changes in the deficit and *ex ante* real interest rate measures. If increases (decreases) in the deficit generally were associated with increases (decreases) in real interest rates, then the vast majority of the associated pairs of deficit-interest rate changes would be in the first (I) and third (III) quadrants of the chart. As a perusal of chart 3 indicates, however, the points are scattered fairly randomly with half of them in the "wrong" parts of the chart.

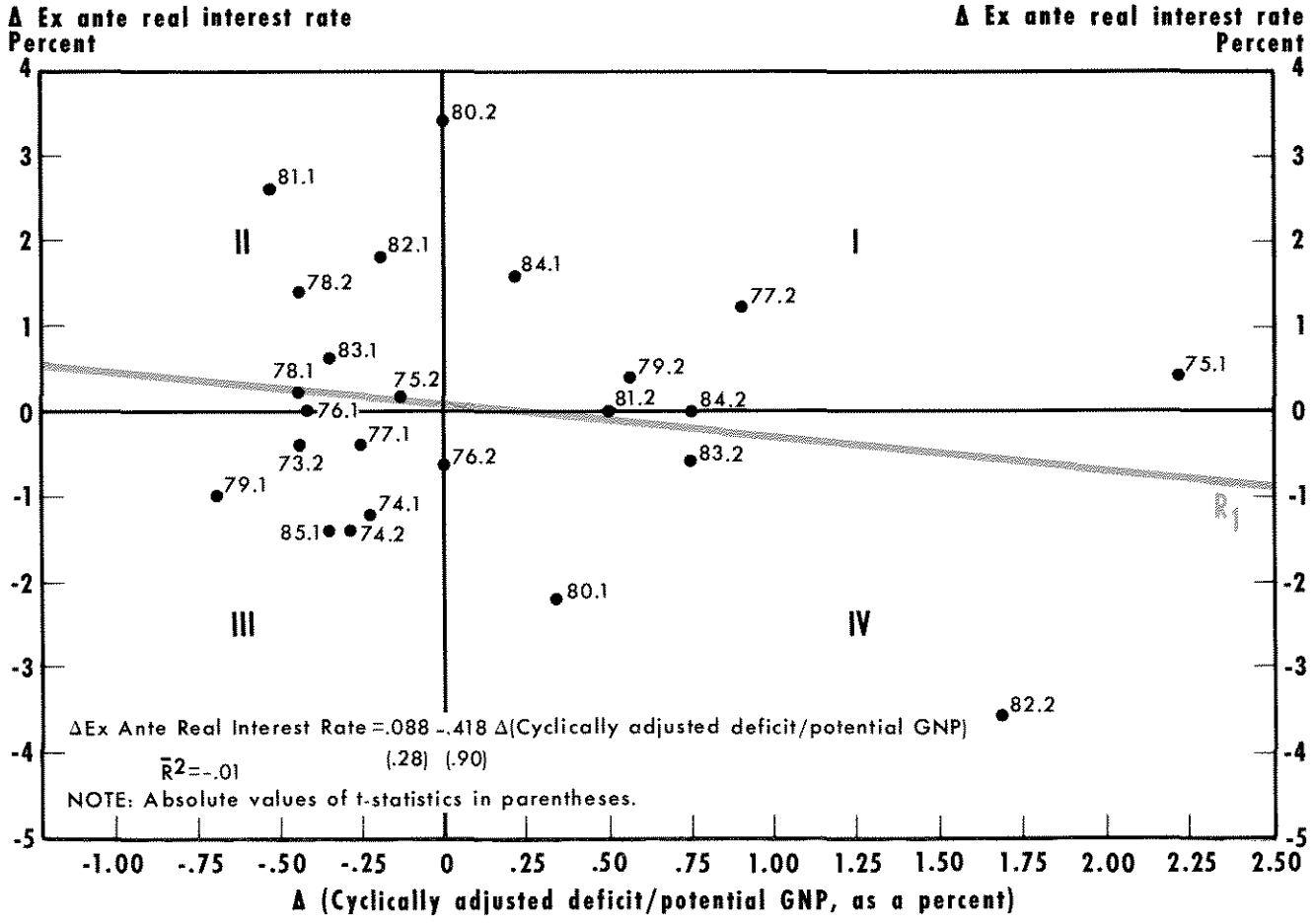
The solid line, labeled R_1, is the regression line

[9]For discussion of the rationale and use of cyclically adjusted deficit measures, see Tatom (1984); for discussion of the impact of recent recessions on deficits, see Malabre (1985).

[10]The *ex ante* real interest rate series was constructed by the following method: six-month-ahead inflation forecasts for the consumer price index (CPI) were derived from the Livingston survey data. These expected inflation figures were then subtracted from the quarterly averages for the six-month Treasury bill rate for the quarters in which the surveys were taken. For more details on this method, see Holland (1984).

Chart 3

Changes in Deficit and Ex Ante Real Interest Rate



showing the estimated linear relationship between changes in the deficit measure and changes in the expected real rate of interest. The conventional theory suggests that the line should slope upward from left to right in chart 3; in fact, it does not. The slope, however, is not statistically significant. Thus, a simple analysis suggests that changes in the deficit have no significant effect on movements in the real rate of interest.

Deficits and Interest Rates: Some Econometric Evidence

Charts 2 and 3 are not intended to demonstrate that deficits have no effects on real interest rates; they do show that there is no easily discernible relationship between them. Because a host of other influences could have confounding effects on such a simple comparison, more detailed econometric analysis is required to decipher the impact of deficits on interest rates.

Unfortunately, such analyses generally have not been able to isolate the effects of deficits on real interest rates or draw any firm conclusions. Table 1 which contains a summary of such studies, shows evidence that is highly ambiguous.[11] While some studies found positive impacts of deficits on interest rates other studies found mixed or even negative effects while the effects were statistically significant in some studies, they were insignificant in others. Another summary of such studies reported similar findings.[12]

[11]See Congress (1984), p. 100.

[12]U.S. Department of the Treasury (1984).

Table 1

Federal Deficits and Interest Rates: Some Empirical Findings

Author (Year of Study)	Time Period	Data Frequency	Statistical Technique	Dependent Variable: Short-term Interest Rate	Dependent Variable: Long-term Interest Rate	Deficit Variable: Federal Deficit	Deficit Variable: Federal Debt Privately Held	Deficit Variable: Other	Sign of Deficit Variable	Statistically Significant
Bradley (1983)	1966–1982	Monthly	IV[b]	X	X		X		Mixed[a]	No
Canto and Rapp (1982)	1929–1980	Annual	Granger-Sims Tests	X		X			Zero	No
Carlson (1983)	1952–1983	Quarterly	OLS[c]		X		X		Positive	Yes
DeLeeuw and Holloway (1983)	1956–1983	Annual	OLS		X			X	Positive[f]	Yes[g]
Dewald (1983)	1953–1981	Quarterly	OLS	X	X		X		Positive	Mixed[h,i]
Dwyer (1982)	1952–1978	Quarterly	VAR[d]				X		Mixed	No
Evans (1983)	1979–1983[a]	Monthly	OLS	X	X	X			Negative	Mixed[j]
Fackler and McMillin (1983)	1963–1979	Quarterly	VAR		X		X		Zero	No
Feldstein and Eckstein (1970)	1954–1969	Quarterly	OLS		X		X		Positive	Yes[k]
Feldstein and Chamberlain (1973)	1954–1971	Quarterly	OLS		X	X	X		Negative	No
Frankel (1983)	1954–1980	Annual	Theil-Goldberger mixed estimation	X	X		X		Mixed	No
Hoelscher (1983a)	1952–1976	Quarterly	IV	X			X	X	Positive	No
Hoelscher (1983b)	1953–1982	Annual	IV&OLS	X	X	X	X	X	Mixed	Mixed[l]
Kudlow (1981)	1958–1980	Annual	OLS		X			X	Positive	Yes
Makin (1983)	1959–1981	Quarterly	OLS	X		X		X	Positive	Mixed[m]
Makin and Tanzi (1983)	1960–1981	Quarterly	IV	X		X			Mixed	Yes
Mascaro and Meltzer (1983)	1969–1981	Quarterly	OLS	X	X		X		Mixed	No[n]
Miller (1982)	1948–1982	Annual	VAR	X				X	Positive	No
Motley (1983)	1958–1982	Monthly	OLS	X			X		Mixed	Mixed[o]
Plosser (1982)	1954–1978	Quarterly	VAR	X	X		X		Mixed	No[p]
Sinai and Rathjens (1983)	1960–1982	Quarterly	OLS	X	X	X	X	X	Mixed	Mixed

[a]Also 3 major war periods.
[b]Instrumental variables.
[c]Ordinary least squares.
[d]Vector autoregressions.
[e]Some positive, some negative.
[f]Negative in first-difference form.
[g]No in first-difference form.
[h]Some significant, some insignificant.
[i]No short rate, Yes long rate.
[j]No short rate, Yes long rate.
[k]Mixed signs and significance in flow models.
[l]No and negative sign for short rate, Yes and positive sign for long rate.
[m]Not significant in one case, marginally in other.
[n]Yes and negative for short rate for 1969-1979.
[o]No for most recent period.
[p]3 instances of significance at 10% level.

SOURCE: *The Economic Outlook* (February 1984), Congressional Budget Office. Simulation references were deleted.

Thus, it appears that econometric studies provide only weak evidence to support the view that federal deficits have a significant influence on interest rates.[13]

LINK #2: WOULD LOWER U.S. REAL INTEREST RATES REDUCE THE FOREIGN EXCHANGE VALUE OF THE DOLLAR?

Most farm commodities traded in international markets are priced in U.S. dollars regardless of where they are produced. Consequently, a set of events that raised the value of the dollar in terms of Brazilian cruzeiros, for example, would make Brazilian soybeans less expensive than U.S. soybeans. Nations that import soybeans could use their dollars to purchase cruzeiros and, hence, purchase Brazilian soybeans more cheaply than before. Because of this relationship, changes in farm exports are linked to changes in the value of the dollar.

While we typically think of the value of the dollar vis-a-vis one or another specific country's currency — for example, the Japanese yen, the French franc or the West German mark — such bilateral exchange rates by themselves, do not provide a clear picture of what is happening to the overall value of the dollar in foreign exchange markets. Instead, an *index* of the dollar's value often is used to incorporate information about the movement of the dollar relative to other major currencies. One index, called the trade-weighted exchange rate of the U.S. dollar, enables us to determine what is happening to the dollar's value relative to the currencies of our major trading partners.[14]

The foreign exchange value of the dollar is the relative price of the U.S. dollar in terms of other nations' currencies. The actual value of the dollar at any time is determined by the factors that underlie the demand for and supply of dollars in foreign exchange markets.

There currently is some controversy over which factors determine exchange rates and the relative influences they have on exchange rate movements at any particular moment.[15] There is, however, a fairly general analytical framework that suggests four factors as the main influences on the behavior of exchange rates: (1) differences in inflation rates between countries; (2) differences in real interest rates between countries; (3) differences in real economic conditions that influence trade patterns; and (4) differences in political and other risks associated with investment in specific countries.[16] We focus on the effects of changes in the first two factors on exchange rate movements. Unfortunately, changes in the remaining two factors can make it difficult to decipher the actual impacts of changes in inflation and real interest rate differentials on the exchange rate at any given moment.

Adjusting the Exchange Rate for Differences in Inflation Across Nations

Theoretical considerations suggest that changes in bilateral and trade-weighted foreign exchange values of the dollar are inversely related to differences between U.S. and foreign inflation rates. If this inflation differential (U.S. minus foreign) is positive, the value of the dollar will decline over time; if the inflation differential is negative, the dollar's foreign exchange value will rise.

This relationship, called purchasing power parity, is based on the notion that similar goods traded in world markets must command similar prices, regardless of where they are bought and sold. For example, if a bushel of corn costs $1.50 in the United States and £3 in the United Kingdom, an exchange rate of £2 per dollar would "equalize" the price of U.S. and U.K. corn to all purchasers. If inflation in the United States drove the price of corn to $3 per bushel, then, other things the same, the exchange rate would have to fall to £1 per dollar to bring the price of U.S. corn back in line with U.K. corn in world markets.

Of course, if changes in the value of the dollar were simply the result of changes in these inflation differen-

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[13]For a detailed discussion of the major problems associated with empirical estimation of the deficit's impact on interest rates, see Congress (1985a), pp. 77–84.

[14]The trade-weighted exchange rate used in this study is the Federal Reserve Board index (March 1973 = 100) of the weighted-average exchange value of the U.S. dollar against the currencies of other G-10 countries plus Switzerland. Weights are the 1972–76 average total trade shares of each of the 10 countries.

[15]For example, one analyst has noted that "there is no consensus on how exchange rates are determined. The interpretations vary widely among the various theories, ranging from the traditional approach of trade-oriented demand and supply factors, to the modern approach of asset-market mechanism and expectations. The analysis of currency determination is complicated by the interdependence of the exchange rates, monetary and other economic policies, and factors affecting economic and financial performance." Poniachek (1983), p. 2.3.3.

[16]This discussion is based on the framework developed in Isard (1980).

tials, exchange rate movements would be neutral with respect to trade patterns. Indeed, other things unchanged, exchange rate movements consistent with purchasing power parity will preserve current trade patterns.

Exchange rates are affected by other factors, however, so that their movements are not consistent solely with purchasing power parity conditions. If exchange rates rise more (or fall less) than inflation differentials warrant, prices of U.S. goods will rise relative to similar goods sold by other countries; if exchange rates rise less (or fall more) than inflation differentials warrant, prices of U.S. goods will fall relative to foreign-produced goods.

This discussion suggests that, if we want to assess the effect of exchange rate movements on exports in general, and farm products in particular, we should look at the movement in exchange rates after adjusting for the effects of inflation differentials. One such exchange rate measure is called the *real* trade-weighted exchange rate for the U.S. dollar.[17]

The Impact of Real Interest Rate Differences on the Real Exchange Rate

Theoretical considerations suggest that changes in the real trade-weighted exchange rate should be positively related to changes in the real interest rate differential (U.S. minus foreign). If U.S. real interest rates rise relative to foreign real rates, other things the same, the real trade-weighted value of the dollar should rise; if U.S. real interest rates fall relative to foreign real rates, the real trade-weighted value of the dollar should decline. The presumption is that a positive real rate differential will attract foreign capital, while a negative differential will make investment abroad more attractive. Thus, changes in the real rate differential should cause similar changes in the real trade-weighted exchange rate.

Changes in Real Interest Rate Differentials and the Real Exchange Rate: Casual Evidence

Chart 4 shows what has happened to the real trade-weighted exchange rate and one measure of the expected real interest rate differential (U.S. minus foreign expected real interest rates) from 1973 to the present.[18] These data suggest that the link between the real interest rate and the real exchange rate is not especially reliable. For example, average real interest rate differentials were approximately the same in the 1975–78 and 1982–85 periods, yet the real exchange rate was falling in the former period and rising in the latter one.

Chart 5 shows a somewhat different way of looking at the relationship between movements in the real interest differential and movements in the real exchange rate. It is a scatter-diagram of changes in the real interest rate differential and the associated percent changes in the real exchange rate. Other things unchanged, economic theory predicts that the points should lie predominantly in the first (I) and third (III) quadrants; positive (negative) changes in the real interest rate differential should be associated with positive (negative) percent changes in the real exchange rate. This is not the case: the data points lie mainly in quadrants II and IV.

The line labeled R_2 is the regression line relating the percent changes in the real trade-weighted exchange rate associated with the changes in the expected real interest rate differential. It should slope upward from left to right; instead, it slopes downward, suggesting that an increase (decrease) in the real interest rate differential is associated with a decrease (increase) in the real exchange rate. This estimated inverse relationship, however, is not a statistically significant one; that is, the claim that there is no simple linear relationship between these variables cannot be rejected at standard statistical significance levels. This puzzling result again suggests that deciphering the effect of changes in real interest rate differentials on exchange rate movements requires detailed and careful econometric analysis.

Some Econometric Evidence

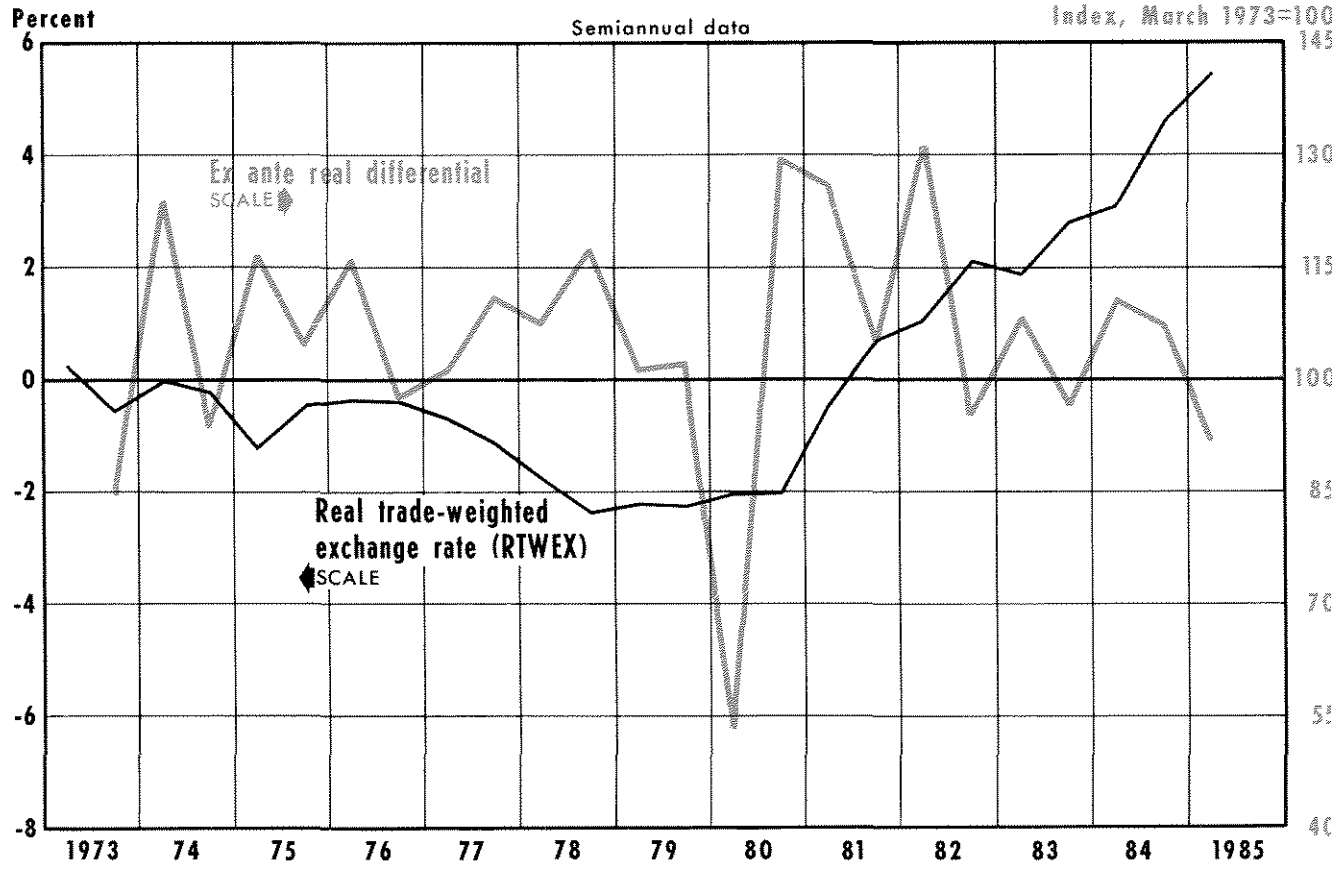
Empirical studies of real exchange rates and real interest differentials offer a somewhat qualified view of their relationship. For example, one recent investigation of the issue found a small statistically significant lagged response of the real exchange rate to the real

[17]The real trade-weighted exchange rate is the nominal trade-weighted exchange rate described earlier (see footnote 14) divided by the ratio of the U.S. consumer price index (CPI) to the foreign, trade-weighted CPI, each indexed to March 1973.

[18]The *ex ante* real interest rate differential is obtained from the U.S. three- and four-month money market interest rate minus the trade-weighted average three- and four-month money market rates for six industrialized countries adjusted by corresponding Organization for Economic Cooperation and Development (OECD) inflation forecasts.

Chart 4

Real Trade-weighted Exchange Rate and Real Interest Rate Differential



interest rate differential.[19] Specifically, the study found that a 10-basis-point change in the U.S. minus foreign real interest differential would cause, after two quarters, a 0.23 percent rise in the real value of the dollar. This study also found no independent effect of deficits on the real exchange rate.[21] In general, it appears that we know very little about the extent to which real interest rate differentials actually affect real exchange rates.

LINK #3: WOULD A LOWER VALUE OF THE DOLLAR INCREASE U.S. FARM EXPORTS?

Farmers and legislators would like to increase the real value of U.S. farm exports. Would lower exchange rates result in a significant increase in real farm exports?

We discussed earlier how exports *could* be affected by changes in the exchange rate. Purchasing power parity conditions suggest that movements in exchange rates should exactly offset changes in the price of the same commodity in different countries following some adjustment period. For example, the price of corn should be the same across countries after adjustments are made for exchange rate differences and costs of transportation.

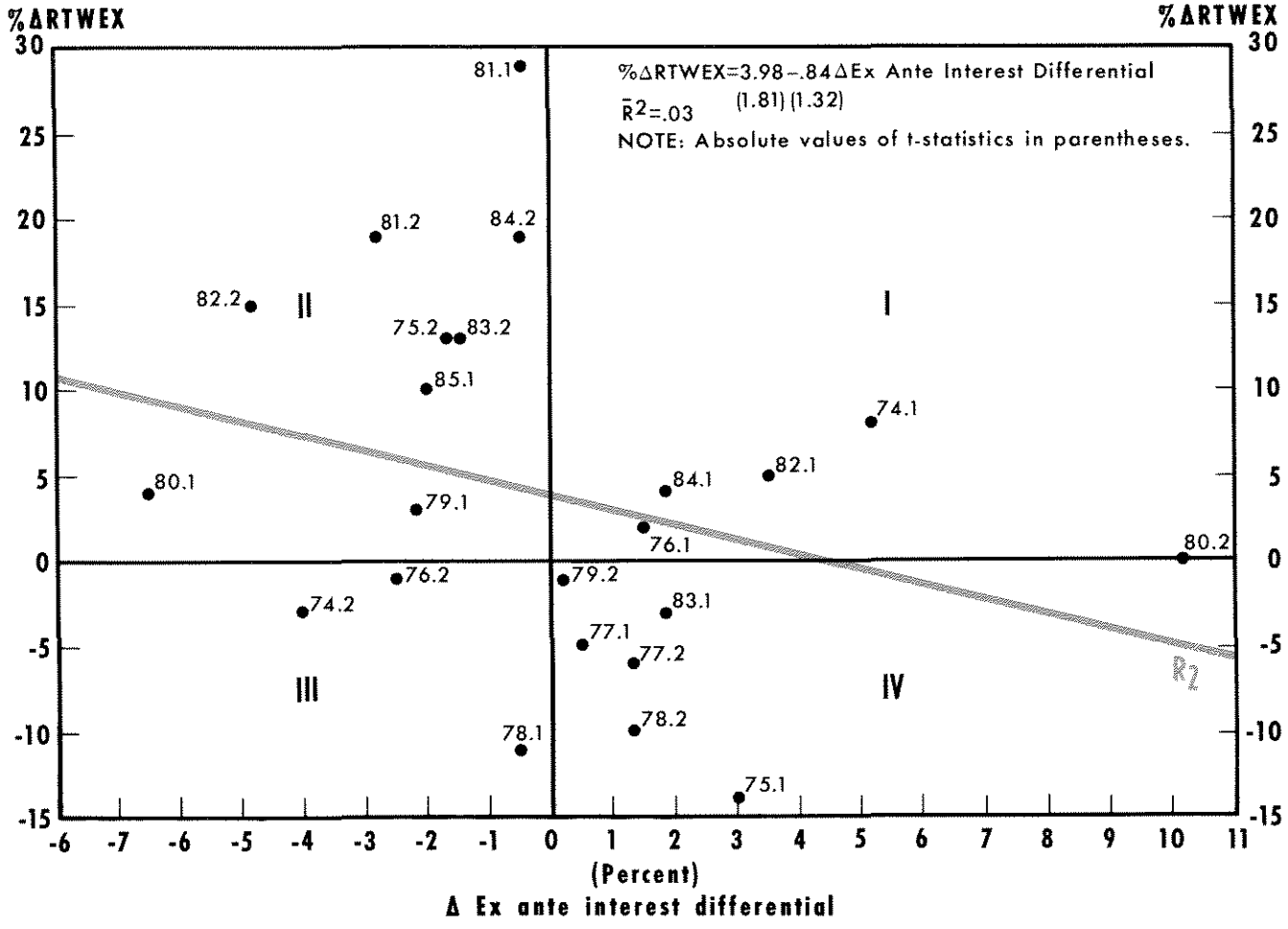
[19]Batten and Belongia (forthcoming 1986).

[20]The estimated coefficients from this type of statistical study are strictly valid only for small changes in variables. Therefore, the example presented should not be expanded to conjecture, for example, that a 100-basis-point change in the interest differential would cause a 2.3 percent change in the dollar's real value.

[21]Similar results were found by Bisignano (1985).

Chart 5

Growth of Real Trade-weighted Exchange Rate and Change in Real Interest Rate Differential



There is substantial evidence, however, that purchasing power parity does not necessarily hold in the short-run and that a considerable period of time, perhaps as long as five to 10 years, may be required before it finally is reached. If this is the case, deviations from purchasing power parity, characterized by changes in the *real* exchange rate, may have persistent and significant effects on real farm exports.

Changes in the Real Exchange Rate and Real Farm Exports: Casual Evidence

Chart 6 displays the behavior of the real exchange rate and real farm exports since 1973. Depending upon the specific years chosen, a perusal of the chart yields both confirming and contradictory evidence for the presumed inverse relationship between movements in the exchange rate and farm exports. For example, exchange rates and farm exports moved in opposite directions from 1976 to the first half of 1979, in 1982, and from the second half of 1984 to the first half of 1985. However, exchange rates and farm exports moved generally in the same direction from 1973 to the first half of 1976 and from 1979 to 1980; moreover, farm exports remained virtually unchanged from 1980 to the first half of 1982, and from the second half of 1982 through 1984, two periods when exchange rates were rising dramatically.

Chart 6
Real Trade-weighted Exchange Rate and Real Farm Exports

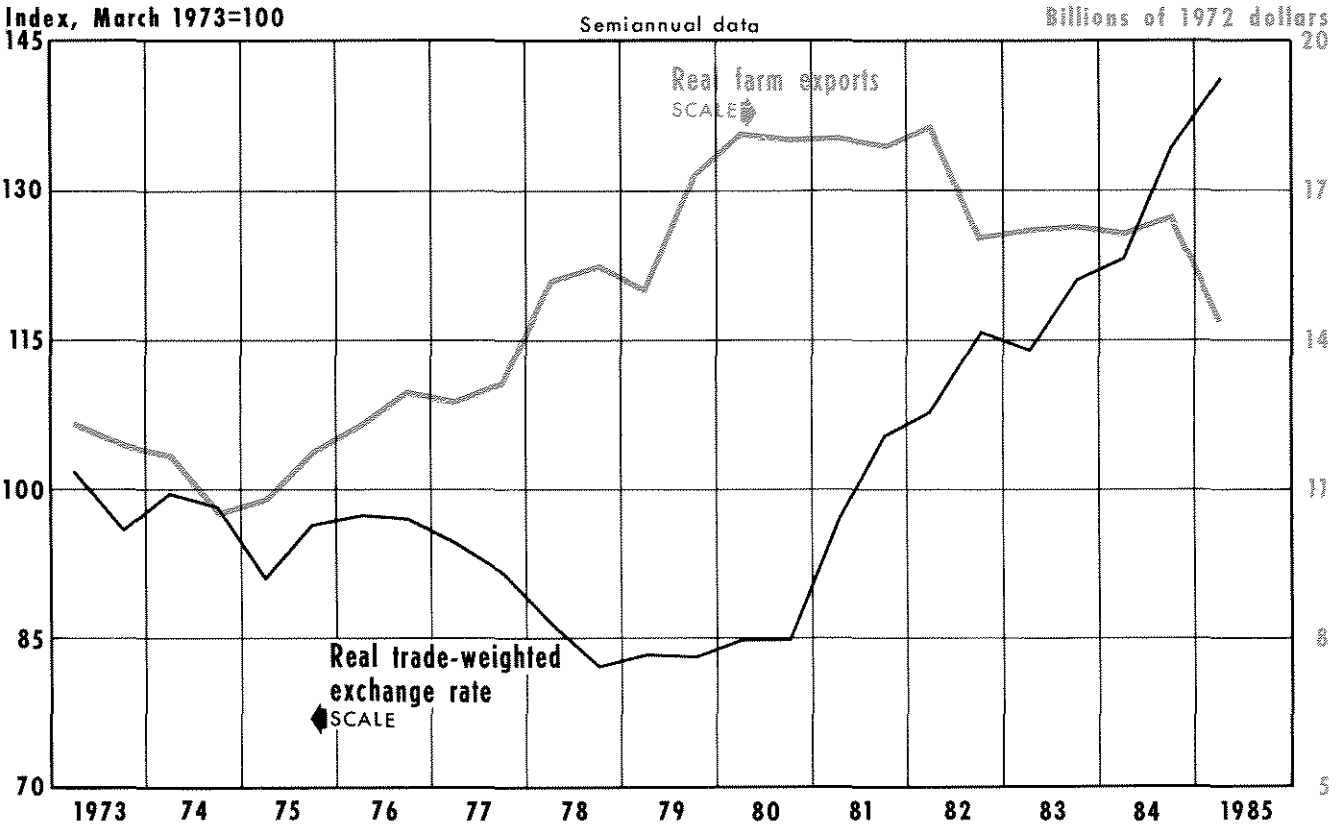


Chart 7 displays a scatter-diagram of changes in the real exchange rate and associated changes in real farm exports since 1973. Other things unchanged, economic theory predicts that the points should lie predominantly in the second (II) and fourth (IV) quadrants; positive (negative) changes in the real exchange rate should be associated with negative (positive) changes in real farm exports. This, however, is not the case: the data points are randomly scattered throughout the four quadrants and nearly half of them lie in the wrong ones.

The line labeled R_3 is the regression line relating the percent changes in real farm exports associated with the percent changes in the real exchange rate. It should slope downward from left to right and it does. The negative slope, however, is not statistically significant. Thus, the possibility that there is no contemporaneous relationship between changes in the exchange rate and farm exports cannot be rejected.

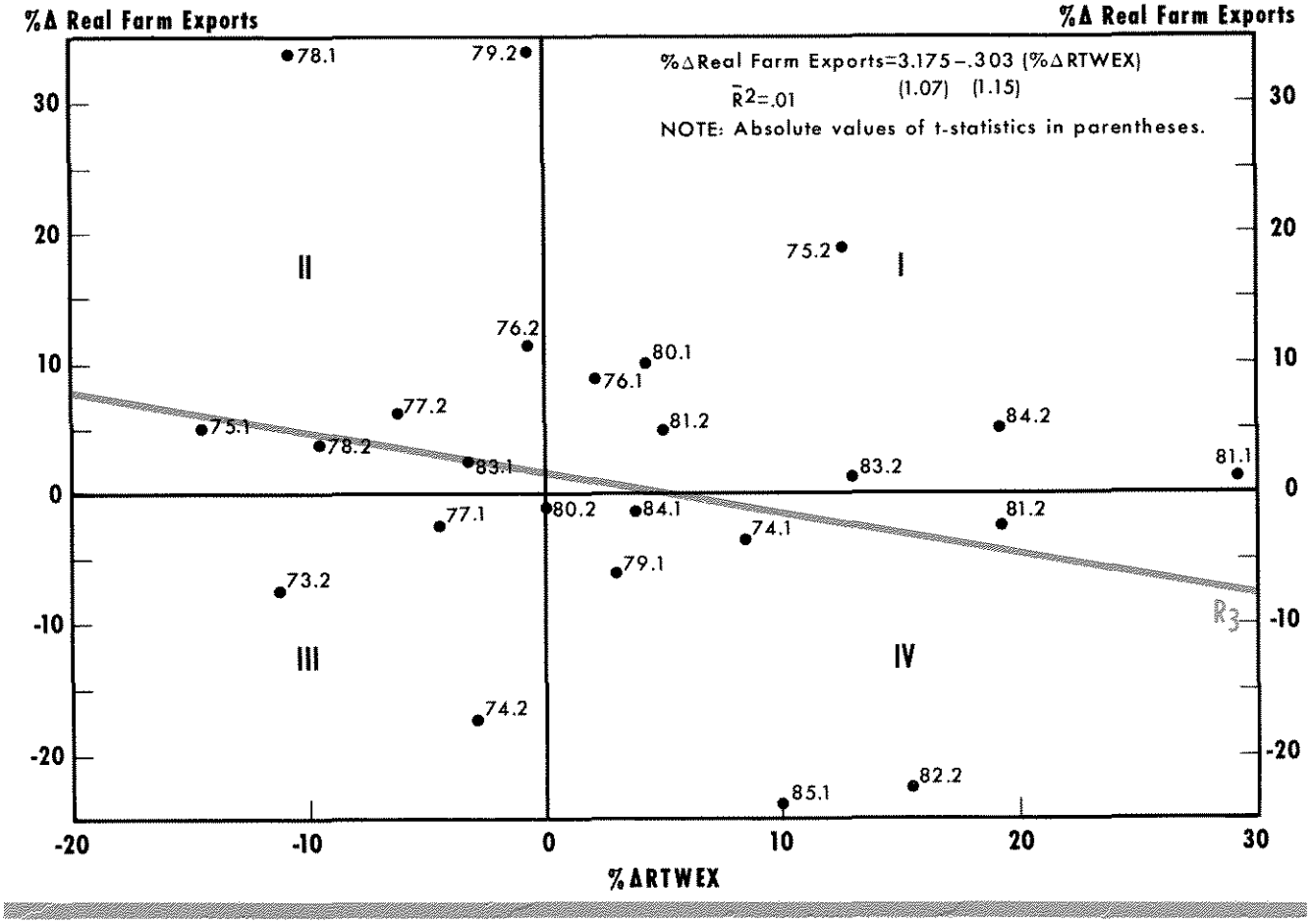
Some Econometric Evidence

Empirical studies have shown that changes in the real exchange rate do affect imports and exports over a considerable time period. When these longer-run effects are taken into account, movements in the real exchange rate have the expected effects on imports and exports. A summary of selected studies examining the long-run impact of changes in the real exchange rate on the demand for U.S. merchandise exports and imports is shown in table 2.[22] Merchandise exports consist of all products, including farm products, exported to the rest of the world; the "long-run price elasticity of export demand is the total percentage change in export volume in response to a sustained 1 percent change in the relative price of U.S. exports to

[22]See Congress (1985b), p. 49.

Chart 7

Growth of Real Trade-weighted Exchange Rate and Real Farm Exports



foreigners, after it has had time to adjust fully."[23] The elasticities are all negative as expected. Although the estimated elasticities range from −0.3 to −2.3, the more recent ones run close to −1, indicating that a 1 percent drop in the real exchange rate will, after sufficient time passes, induce a 1 percent rise in total merchandise exports.

Two recent studies focused specifically on the effect of changes in the exchange rate on agricultural exports.[24] After estimating a simple quarterly reduced-form equation for the real value of farm exports, they find that a 1 percent fall in the *real* value of the dollar will increase the real value of farm exports by 0.7 percent within one and one-quarter years.[25] Thus, unlike the previous two links, the third link in the chain running from deficits to farm exports has both theoretical and empirical support.

SUMMARY

There is a widely shared view that federal deficits have contributed significantly to higher nominal and real interest rates in the United States. Moreover, it is commonly believed that these higher rates have contributed significantly to the rising foreign exchange

[23]See Congress (1985b), p. 48.

[24]Batten and Belongia (1984, forthcoming 1986).

[25]Batten and Belongia (forthcoming 1986).

Table 2
Long-Run Price Elasticities of Demand for U.S. Merchandise Exports and Imports

Exports			Imports		
Study or Model	Year of Estimate	Elasticity	Study or Model	Year of Estimate	Elasticity
Adams et al.	1969	−0.60	Adams et al.	1969	−1.16
Houthakker-Magee	1969	−1.51	Houthakker-Magee	1969	−1.03
Basevi	1973	−1.44	Armington	1970	−1.73
Hickman-Lau	1973	−1.38	Taplin	1973	−1.05
Samuelson	1973	−1.13	Beenstock-Minford	1976	−1.04
Stern et al.	1976	−1.41	Stern et al.	1976	−1.66
Goldstein-Khan	1978	−2.32	Gylfason	1978	−1.12
Gylfason	1978	−0.62	Geraci-Prewo	1980	−1.23
Amano et al.	1981	−0.32	Goldstein-Khan	1980	−1.12
DRI Model	1982	−0.83	DRI Model	1982	−0.56
Helkie	1983	−0.90	Helkie	1983	−0.85
Wharton Model	1984	−0.98	Wharton Model	1984	−0.64
Average		−1.12	Average		−1.10

SOURCE: *The Economic and Budget Outlook: An Update* (February 1985), Congressional Budget Office.

value of the dollar. Thus, it frequently is argued that our nation's exporting sectors, producers of farm commodities in particular, will continue to suffer until federal deficits are reduced and U.S. interest rates are brought down.

In this article, we examined three vital links in the conventional argument that ties the deficit to farm exports. With respect to the first link, we noted that there is considerable theoretical controversy over whether larger deficits actually cause real interest rates to increase. We found little empirical evidence to support this view.

Second, we noted that, even if lower deficits did result in lower U.S. real interest rates, they would not necessarily have a salutary impact on the real exchange rate. Apparently, other influences on the real exchange rate have offset the effect, if any, of changes in real interest rate differentials in recent years. Among these other factors may be "the strong performance of the U.S. economy, confidence in the strength and stability of the political system in the United States, capital flight from debtor countries, [and] a substantial shift in the external position of American banks."[26] The important point is that there is little empirical evidence to show that changes in the real interest rate differential have had a significant impact on movements in the real exchange rate during the past 13 years.

Finally, we showed that, although U.S. farm exports are inversely related to the real exchange value of the dollar, the demand relationship is inelastic and exchange rate movements have their full effect only over a considerable time period. However, even though lower exchange rates would, over time, increase U.S. farm exports, the failure of the first two links to be supported suggests that we cannot necessarily expect that lower deficits will result in a lower value of the dollar in foreign exchange markets.[27]

None of the discussion above should be taken as evidence that deficits per se are either good or harmless. Nor does it prove that larger deficits have had no adverse effect on real interest rates, on the foreign exchange value of the dollar or on farm exports. Unfortunately, at the present time, there continues to be

[26]Pöhl (1985). Similar comments have been made by a wide variety of commentators: e.g., "At various times, other factors, which are difficult to measure, have also influenced the dollar ... The reversal in the dollar's fortunes since late 1980 may [be] related to (i) the election of a new administration committed to a more conservative approach to financial policies; and (ii) the increased risks associated with other currencies." Atkinson et al. (1985), pp. 37 and 39.

[27]See Poole (1985) for a discussion of why lower budget deficits might be expected to *raise* the value of the dollar.

considerable uncertainty about the effects that larger deficits actually have had on these key economic variables.[28]

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[28]For additional discussion and empirical evidence supporting this conclusion, see Bisignano (1985) and Wallis (1985). Even Dobson, whose diagram of the deficit's effects on the economy appears in figure 1, notes that "how much the federal deficits influence the variables in the diagram is not known with much certainty." Dobson, (1984), p. 49.