BUDGET DEFICITS AND THE BALANCE OF TRADE

B. Douglas Bernheim
Stanford University and NBER

The object of this chapter is to identify historical relationships between fiscal policy and the current account for the United States and five of its major trading partners. I attempt to provide some measures of the extent to which variations in budget deficits explain variations in current account balances, both across time and across countries. Overall, the evidence corroborates the view that fiscal deficits significantly contribute to a deterioration of the current account. Indeed, it appears that U.S. budget deficits have been responsible for roughly one-third of the U.S. trade deficit in recent years.

1. INTRODUCTION

In recent years, the U.S. economy has been characterized by soaring federal deficits and deteriorating trade balances. Many analysts suspect that these features are closely, and perhaps even causally, related. Indeed, national income accounting identities guarantee that budget deficits must create either an excess of private saving over investment or an excess of imports over exports. Standard economic reasoning suggests that government borrowing decreases the domestic supply of funds available to finance new investment, which leads to an inflow of funds from overseas. An offsetting

adjustment to the current account is then required to reestablish international account balance. In short, budget deficits may well produce trade deficits.

This observation raises a number of questions concerning the effects of alternative fiscal policies. To what extent can one attribute the current U.S. trade deficit to budget deficits? How might legislation such as the Gramm-Rudman-Hollings Act affect the balance of payments? Is fiscal policy an effective tool for influencing patterns of international trade?

The object of this chapter is to identify historical relationships between fiscal policy and the current account for the United States and five of its major trading partners. I attempt to provide some measures of the extent to which variations in budget deficits explain variations in current account balances, both across time and across countries. The reader should bear in mind that even a strong empirical correlation between these two variables does not necessarily indicate a causal relationship—the fact that budget and trade deficits have moved together in the past does not guarantee that the current account will respond in the same way to future fiscal policy innovations. Nevertheless, a robust empirical pattern would signal the existence of some systematic underlying relationship and, in the context of sound economic arguments, would lend support to the hypothesis that fiscal deficits cause the balance of payments to deteriorate.

To the extent historical experience provides a reliable guide for policy, my analysis of U.S. time series suggests that a $1 increase in government budget deficits leads to roughly a $0.30 rise in the current account deficit. I obtain similar figures for Canada, the United Kingdom, and West Germany, as well as from an overall cross-country comparison. For Mexico, the historical relationship between trade deficits and budget deficits suggests that this effect is significantly larger, perhaps $0.80 to a dollar. In contrast, for Japan the data appear inconsistent with the view that budget deficits significantly affect the current account balance. This may well reflect the stringent controls that the Japanese have traditionally placed on international trade and flows of capital.

Overall, the evidence corroborates the view that fiscal deficits significantly contribute to a deterioration of the current account. Indeed, it appears that U.S. budget deficits have been responsible for roughly one-third of the U.S. trade deficit in recent years. Accordingly, the implementation of the Gramm-Rudman-Hollings deficit reduction provisions could dramatically improve the U.S. balance of trade.

The chapter is organized as follows. In section 2, I discuss the link between budget deficits and trade deficits and describe the factors that determine the quantitative importance of this link. Section 3 describes the data used in subsequent sections. I conduct an international comparison in

section 4. Section 5 is devoted to the U.S. experience. The remaining five countries are considered in successive subsections of section 6. Finally, section 7 summarizes and reviews my findings in the context of other evidence on the effects of government budget deficits.

2. THE LINK BETWEEN BUDGET DEFICITS AND TRADE

To clarify the relationship between fiscal deficits and the balance of trade, it is helpful to begin with some national income accounting identities. First, individuals dispose of income (Y) either as consumption (C), saving (S), or taxes (T):

$$Y = C + S + T. \tag{1}$$

Second, income must arise from either the domestic sale of consumption goods (C), investment goods (I), governmental goods (G), or the net sale of goods to foreign agents (exports, X, minus imports, M):

$$Y = C + I + G + (X - M). \tag{2}$$

Combining equations (1) and (2), we obtain

$$C + S + T = C + I + G + (X - M),$$

which simplifies to

$$T - G = (X - M) + (I - S). \tag{3}$$

In words, equation (3) states that the government budget surplus is equal to the trade surplus plus the excess of investment over private saving. Suppose then that the government fixes spending (G), and cuts taxes (T), thereby creating a deficit. Equation (3) indicates that, as a result, either the trade surplus ($X - M$) must decline or the excess of investment over saving ($I - S$) must decline, or both. Note that this conclusion follows directly from accounting and does not depend on any behavioral theories.

Nevertheless, whether the impact of budget deficits falls on $X - M$ or $I - S$ is an open question. Indeed, there are two important conditions under which fiscal policy would only affect $I - S$ and leave net exports unchanged. The first condition would arise if world capital markets were completely nonexistent. In that case, all investment would have to be

financed domestically. Accordingly, private saving would always equal the sum of investment and government borrowing. An increase in the deficit would necessarily produce a commensurate increase in $S - I$, and $X - M$ would remain unchanged. The second condition would arise if taxpayers did not believe that higher disposable income resulting from fiscal deficits constitutes an increase in available resources. If people understand that deficits merely postpone taxes, and if they expect to pay the postponed tax at some point in the future, then they may respond to a tax cut by saving all incremental disposable income toward the future liability. Accordingly, saving would rise by exactly the amount of the deficit—any change in T (with G fixed) would alter S, and leave I, X, and M unchanged.

The empirical relevance of both these conditions is highly controversial. The efficiency of world capital markets has been debated by Harberger (1978,1980), Feldstein and Horioka (1980), and Feldstein (1983). More recently, Frankel (1986), Sachs (1981), Obstfeld (1986), and Summers (1986a) have made significant contributions in this area. It now appears that international capital markets are integrated to a very large extent, and that this integration is in some ways imperfect. The extent to which individuals anticipate and save for future tax liabilities has also received a great deal of attention in recent years, with most of the discussion focusing on Barro's (1974) notion of "Ricardian equivalence." In Bernheim (1987), I reviewed the existing theory and evidence concerning the doctrine that fiscal deficits are economically irrelevant, and concluded that this doctrine is not at all descriptive of the U.S. economy.

Since it seems that neither of the two conditions described above holds in practice, we may conclude that budget deficits almost certainly affect the balance of payments. I have mentioned these conditions not because I take them to be empirically plausible, but because they help us to identify the factors that will determine the magnitude of the impact of fiscal policy on trade deficits. If one believes that international capital markets are well integrated and that taxpayers tend to consume out of disposable income, then one is naturally led to the conclusion that this impact must be quite large.

It is useful to trace the economic links between budget deficits and trade in some detail. The standard story (see Branson (1985)) works as follows. When the government cuts taxes (holding spending constant), taxpayers respond by increasing consumption. If the economy is initially in a state of full employment, national saving must fall. Domestic funds are then insufficient to cover all profitable investment opportunities (at current interest rates) plus government borrowing. This imbalance between the supply and demand for funds places upward pressure on interest rates. Higher rates lead to less investment and more saving, but this redresses

only a portion of the imbalance. Attracted by the availability of more profitable investment opportunities, foreign investors increase their supply of financial capital to the United States. To accommodate this shift in the international capital account, it is necessary to have an offsetting change in the current account. Specifically, investments in the United States require foreign capitalists to acquire U.S. currency. The resulting increase in the demand for dollars drives the value of the dollar up, making it more attractive for U.S. consumers to purchase imports and less attractive for foreign consumers to purchase U.S. exports.

Alternatively, if the economy is not initially in a state of full employment, then tax cuts may stimulate production. This would cause both national income and private saving to rise. Accordingly, national saving may decline much less than in a fully employed economy. The effect of budget deficits on trade deficits is therefore likely to be smaller in the presence of unemployed resources.

Finally, budget deficits may stimulate investment by raising the return to capital. This could occur through two channels. First, in the presence of unemployed resources, deficits may augment aggregate demand, thus generating higher returns to investment. Second, deficits permit the reduction of taxes on capital income, which raises the after-tax rate of return. In either case, the effect is to widen the gap between investment and national saving. International account balance then requires a larger increase in the current account deficit.

Although there has been a great deal of empirical work on the efficiency of international capital markets and the effect of government budget deficits on national saving, there has been almost no effort to measure the impact of fiscal policy on the balance of trade. Two exceptions are Milne (1977) and Summers (1986b). Milne studied time series data from thirty-eight countries for the period 1960–1975. Her strategy was simply to regress the current account deficit on the government budget deficit for each of the thirty-eight countries. This strategy produced mixed findings. Unfortunately, in considering so many countries, Milne was unable to analyze the data from any country in great detail and therefore failed to consider factors other than fiscal deficits that might have influenced trade deficits in systematic ways. As we shall see, the apparent absence of a systematic relationship between fiscal policy and trade can often be explained upon more careful analysis of the data. Although Summer's (1986b) findings corroborate the view that budget deficits depress the current account balance, his analysis was confined to the United States.

My strategy here is to employ a relatively small sample of countries: the United States and its five largest trading partners (as measured by U.S. exports). For each country, I analyze the historical relationship between

budget deficits and current account balances, paying careful attention to third factors that might have influenced patterns of trade in any particular year.

3. DATA

I focus on the experiences of the United States and its five largest trading partners (as measured by U.S. exports)—Canada, the United Kingdom, West Germany, Japan, and Mexico—during the twenty-five-year period from 1960 to 1984. With a few exceptions (noted below), the data are drawn from the OECD National Accounts.

The first variable employed here is net saving for the general government. The OECD defines net government saving as the sum of direct and indirect taxes, the operating surplus of government enterprises, property income, and transfers received minus the sum of final consumption expenditures, payment of interest, rent, and royalties, subsidies, and transfers made. The general government includes the central government, social security funds, and all provincial, state, and/or local governments. I use this variable as my measure of the government's budget surplus (the negative of its deficit).

Although the OECD's measure of net government saving is appropriate for accounting purposes, it is in some ways deficient for studying economic behavior. For example, the OECD does not correct government deficits for the inflationary erosion of the value of outstanding debt that occurs during inflationary periods (see Eisner (1986) for a discussion). I have made no attempt to remedy this problem. The reader should therefore bear in mind that the relationship between budget deficits and trade deficits might be somewhat obscured during inflationary periods.

The OECD also provides a measure of each country's current account surplus, denominated in domestic currency. My primary objective is to determine the extent to which variations in the budget surplus variable can explain variations in this measure of the current account.

Throughout this investigation, I treat the budget surplus variable as exogenous. In essence, I assume that budgets are determined independently of the current account balance. This assumption is almost certainly descriptive of the recent U.S. experience, but more generally its validity is debatable. In particular, Summers (1986a) has argued that governments systematically use fiscal policy tools in an effort to maintain approximate current account balance. If this is true, then endogenous fiscal responses will tend to create a negative correlation between the budget surplus and current account surplus. By assuming that budgets are determined exog-

enously, my analysis will therefore tend to *understate* the true relationship between these variables.

It is also important to realize that budget surpluses and trade deficits may move together for entirely spurious reasons. It is therefore necessary to control for a number of third factors. First of all, since most macroeconomic time series tend to grow over time, both variables must be scaled relative to gross domestic product (GDP). Henceforth, I will use BSUR to denote the ratio of the budget surplus to gross domestic product (also obtained from the OECD National Accounts), and CAS to denote the ratio of the current account surplus to GDP. Second, budget deficits, saving, and investment (and hence the current account) all tend to move in systematic ways over the course of the business cycle. Rather than use cyclically adjusted variables, I control for business cycle effects by including current and lagged values of real GDP growth (henceforth denoted GROW) in regression equations explaining the current account surplus. Finally, budget deficits are systematically correlated with government consumption. Higher government consumption should tend to depress national saving, leading to larger current account deficits. I control for this effect by including the OECD's measure of government consumption (henceforth denoted GOV) as an additional explanatory variable in some of the reported regressions.

Unfortunately, OECD data is not available for Mexico. Since Mexico is the only developing country among the five largest U.S. trading partners, its experience is of particular interest. As an alternative data source, I use information collected by the International Monetary Fund (IMF), published in the IMF's *International financial statistics* and *Government financial statistics*. There are several drawbacks to using this data. First, the IMF's methods of accounting and sources of data differ from those of the OECD. This raises the possibility that systematic differences may produce spurious results for cross-country comparisons. Second, IMF data on the net saving of local governments in Mexico is not available after 1982. Since local governments save (or borrow) very little relative to the central government, I chose to use central government net saving as my measure of the Mexican budget deficit rather than to sacrifice the most recent years of data. Third, IMF data on government finances in Mexico are not available at all prior to 1972. My analysis of Mexico is therefore confined to a much shorter time span.

In the case of Canada, I also employ data on bilateral trade relations with the United States. I obtain this data from the IMF's *Direction of trade statistics*. The IMF measures the bilateral trade surplus in U.S. dollars; I express it as a fraction of U.S. GDP (henceforth, I refer to this variable as BTS).

In analyzing these data, it is essential to bear in mind that these variables are not the sole determinants of the trade deficit. Many other factors play

a significant role and may explain apparently anomalous fluctuations in the current account. For the time period considered here, it is particularly important to think about the effects of three kinds of events.

First, from 1971 to 1973 international currency markets were in a period of great flux. The collapse of the Bretton Woods system of fixed exchange rates in 1971 and the intervening turmoil before its eventual replacement with a system of floating exchange rates in 1973 undoubtedly disturbed previous patterns of trade. Indeed, it is arguable that the sample period considered here should be divided into two subperiods in order to allow for systematically different fiscal effects under fixed- and floating-exchange-rate regimes.

Second, the 1970s witnessed two enormous shifts in relative prices and the terms of trade, which were brought about by large increases in the price of oil. The first oil crisis occurred at the end of 1973; oil prices remained abnormally high for 1974 and 1975. The second oil crisis was touched off by the Iranian revolution in 1979. Oil prices rose sharply and remained at very high levels through 1981. After 1981, the price of oil declined somewhat but remained significantly above its precrisis level. During these periods, deteriorations in the balance of trade for oil-importing countries (and improvements for oil-exporting countries) are probably attributable to the oil crises rather than to fiscal policy. One must also bear in mind that some countries, such as the United Kingdom, switched from oil-importing to oil-exporting status between the two crises. Finally, the first oil crisis precipitated a significant recession throughout the Western world. Since this had a large impact on saving and the profitability of investment, it may have affected the current account balance in systematic ways.

Third, the United States began to run extremely large budget deficits beginning in 1982. It is important to bear in mind that the current account balance of each country should depend not only on its own budget deficit but also on the budget deficits of its trading partners. In essence, it is the *relative* size of budget deficits that determines which countries will import capital and which will import goods. Thus, U.S. fiscal policy may well have significantly affected the balance of payments for other countries. This is particularly important in the cases of Canada and Mexico, since these countries conduct disproportionately large fractions of their trade with the United States.

4. AN INTERNATIONAL COMPARISON

If fiscal policy plays a significant role in determining the balance of payments, then we should observe a significant relationship between these variables, both over time and across countries. I will therefore begin my
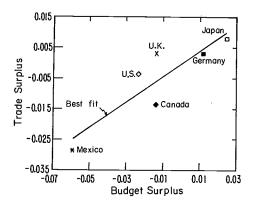
FIGURE 1. *Cross-Country Comparison Ten-Year Averages, 1975–1984*

analysis of the data by comparing budget deficits and trade deficits, averaged over a substantial time interval, for the six countries in my sample.

As one averages over longer time periods, one finds less variation in the current account surplus across countries. Accordingly, I have arbitrarily chosen to study the most recent ten-year period in my sample (1975–1984). For each country I compute ten-year averages of the BSUR and CAS and plot the resulting averages in a scatter diagram (Figure 1).

Note that there appears to be a strong positive relationship between budget surpluses and trade surpluses across countries. The line marked "best fit" represents the best linear approximation to this relationship (as determined by ordinary least squares regression). The slope of this line is 0.412, which indicates that a $1 increase in the budget deficit is associated with a $0.41 rise in the trade deficit. Despite the fact that there are very few data points (only four degrees of freedom), this coefficient is estimated quite precisely; its standard error is 0.108.

Note that the United Kingdom deviates from the best-fit regression line more than any of the other countries. In light of the fact that the United Kingdom became a major oil exporter in the late 1970s, just in time to benefit from the second oil crisis, it is hardly surprising that its current account shows an abnormally large surplus.

It is also noteworthy that Japan has both the highest government budget surplus and the largest current account surplus over this ten-year period. This fact is often obscured by official government statistics, which in recent years have shown the Japanese government running a substantial deficit. It is essential to realize that Japan and the United States follow very different accounting conventions when constructing their national income

accounts (see, e.g., Boskin and Roberts (1986)). For example, the Japanese do not include their social security system as part of the budget of the central government. This particular omission is extremely important, because the Japanese have accumulated substantial resources in social security trust funds over the last several years. Thus, when one employs the OECD accounts for the consolidated government, the Japanese government appears as a large net saver.

In contrast to Japan, Mexico has the largest budget deficit and the largest current account deficit over this ten-year period. As the only developing country in this sample, Mexico's economic problems were different from those of the other five countries, particularly during the 1980s. Specifically, a foreign debt crisis led to the virtual suspension of foreign credit; simultaneously, the IMF imposed an austerity program on the Mexican government. Had foreign credit not been suspended, Mexico would have undoubtedly continued to run very large current account deficits after 1981, and the relationship in Figure 1 would have been all the more pronounced. Nevertheless, one might simply regard the Mexican experience as atypical and argue that it should not be included in the cross-country comparison. If one omits Mexico, a relationship between the budget surplus and current account surplus is still evident, although the slope of the least squares regression line falls to 0.276 (with a standard error of 0.174).

Unfortunately, the empirical pattern noted above may be produced by spurious factors. For example, there may be cultural differences in attitudes toward saving. In countries with high private saving rates, the government may be fiscally conservative, whereas in other countries extravagance may characterize both the public and private sectors. Unless investment opportunities vary systematically with these same predispositions, countries with high public and private saving will also run large current account surpluses (see equation (3)). Thus, a positive correlation between budget surpluses and trade surpluses does not necessarily indicate causality. It is therefore necessary to explore the variation in fiscal policy and current account balances over time as well as across countries.

5. THE U.S. EXPERIENCE

I will begin with an analysis of the U.S. time series. In Figure 2, I plot both the U.S. budget surplus and current account surplus (as a percentage of GDP) against time. One immediately notes a general coherence between the two series. Both have been trending down gradually throughout the twenty-five-year sample period. The shorter-term movements in these series are also often coincident (e.g., between 1978 and 1979 or between
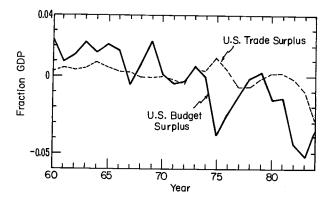
FIGURE 2. *U.S. Time Series 1960–1984*

1981 and 1983), although there are some significant exceptions (most notably between 1974 and 1976, when the two series moved sharply in opposite directions).

It is much easier to see the historical relationship between these two series by plotting the trade surplus against the budget surplus in a scatter diagram (see Figure 3). This diagram reveals that the series are highly correlated. In fact, with few exceptions the data points seem to line up extremely well. The two exceptions are 1975, during which the current
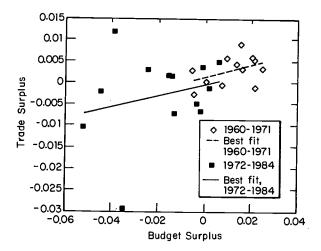

FIGURE 3. *Scatter Plot for United States 1960–1984*

account surplus was abnormally high, and 1984, in which it was abnormally low. 1975 must be considered atypical because trade patterns were undoubtedly disturbed by the first oil crisis, and many countries were experiencing recessions. The large current account surplus may have been due to the slow pace of the U.S. recovery—poor profitability may have caused U.S. capitalists to seek investment opportunities abroad, causing an offsetting movement in the current account (see equation (3)). The budget deficit during these two exceptional years was roughly the same, about 3.5 percent of GDP. Thus, the outliers roughly offset each other, and their inclusion does not much affect one's overall impression of the relationship between budget deficits and trade deficits.

It is possible to quantify the significance of this relationship through linear regression. Specifically, the slope of the line that represents the best fit to the data points in Figure 3 is 0.161. This coefficient has a standard error of 0.069, which indicates that, with 95 percent probability, the true slope lies between about 0.02 and 0.30. A coefficient of 0.161 should be interpreted as indicating that a $1 increase in the budget deficit is associated with a contemporaneous $0.16 increase in the current account deficit.

I have noted in section 3 that a variety of unusual events took place after 1971 (significant changes in the system of international exchange, two oil crises, and large U.S. deficits). One must therefore wonder whether the relationship considered here remained stable throughout the sample period. I investigate this issue by dividing the sample period into two roughly equal segments: 1960–1971 and 1972–1984. In Figure 3, I have differentiated between data points associated with each of these periods. Note that the two subperiods have very different characteristics: before 1972 the United States generally had budget surpluses and healthy current account balances; in later years, deficits were the rule. It is therefore particularly striking that the relationship between fiscal policy and the current account remained essentially unchanged across the two subperiods.

In Figure 3, I have plotted least squares regression lines for 1960 to 1971 and 1972 to 1984 separately. Note that these lines have almost exactly the same slopes. The regression line for 1972 to 1984 is slightly lower, perhaps reflecting a decline of the U.S. saving rate (independent of fiscal policy effects). However, the impact of budget deficits on the current account balance has remained stable over time. It is also possible that the relationship observed in Figure 3 is due to spurious factors that I have not yet considered. One possibility is that both fiscal policy and current account balance vary systematically over the business cycle. To control for business cycle effects, I regressed the current account variable (CAS) on the current budget surplus (BSUR), and current and lagged values of real GDP

growth (GROW). In general, this strengthened the empirical relationship. For example, with a single lagged value of GROW, I obtained

$$CAS = 0.0095 + 0.303 \times BSUR - 0.0015 \times GROW - 0.0011 \times GROW(-1) + \varepsilon$$
$$(0.0032)\quad(0.080)\quad(0.0005)\quad(0.0006)$$

$$R^2 = 0.469$$

where GROW(−1) indicates the value of GROW from the previous year, ε reflects unexplained variation, and standard errors are given in parentheses. After we correct for cyclical variation, the observed relationship between budget deficits and trade deficits is almost twice as large (the coefficient of BSUR rises from 0.161 to 0.303). It is, of course, possible that the current and lagged values of GROW control incompletely for business cycle effects. It is therefore noteworthy that the inclusion of additional lagged variables (GROW(−2) and GROW(−3)) reduces the coefficient of BSUR only slightly.

As mentioned in section 3, a positive correlation between budget deficits and current account balances might also reflect variations in government spending. To test for this possibility, I added the OECD's measure of government consumption (GOV) to the list of explanatory variables. As expected, the coefficient of GOV turned out to be negative (indicating that government consumption contributes to the current account deficit). Somewhat surprisingly, the coefficient of BSUR actually increased slightly (for example, in a specification that included BSUR, GROW, GROW(−1), and GOV, the estimated coefficient of BSUR was 0.324 with a standard error of 0.082).

Figure 3 and the preceding regression results make a strong case for the existence of an empirical relationship between budget deficits and trade deficits, but it is conceivable that this analysis of contemporaneous movements overlooks a significant portion of the story. If, for example, international capital markets are imperfect, then the effects of fiscal policy on international trade may show up only after a lag. That is, capital may flow across national borders in response to differential rates of profit, but it may do so somewhat slowly.

Figure 1 tends to corroborate this conjecture. Generally, it appears that movements in the current account have followed changes in the budget deficit by one or two years. In fact, from 1974 on, the two series appear to track each other extremely well when one shifts the budget surplus forward by two years. In Figure 4, I have plotted the trade surplus against the budget surplus lagged one year. Note that the relationship between these variables is now more striking, and even the outliers in 1975 and 1984
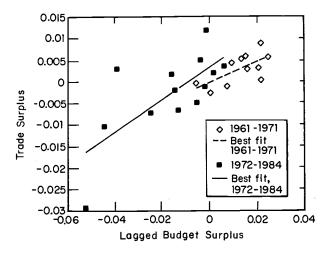
FIGURE 4. *Scatter Plot for United States 1961–1984*

appear less extreme. Indeed, the slope of the regression line in Figure 4 is 0.274. The standard error of this coefficient is 0.057, which indicates that, with 95 percent probability, the true slope lies between 0.16 and 0.39. Thus, the lagged effect is not only larger but is also estimated more precisely than the concurrent effect.

Again we ask whether this relationship has been stable over the entire sample period. Accordingly, in Figure 4 I have distinguished between data points from each of the two subperiods defined above (note, however, that the earlier period must now begin in 1961 in order to accommodate the need for a lagged value of the budget surplus). Both regression lines are clearly downward sloped, although the line for 1972 to 1984 is somewhat steeper. Given the variation around the regression line after 1971, this difference cannot be considered terribly significant.

In light of Figure 4, it is appropriate to study the temporal nature of the relationship between budget deficits and trade deficits more carefully. To determine the precise pattern of these effects, I estimated a regression equation explaining the current account surplus as a linear function of the current budget surplus and the budget surpluses for the previous four years. This procedure necessitated dropping the first four years of data. In order to conserve on valuable degrees of freedom, I placed a restriction on the pattern of coefficients (specifically, I required the lagged coefficients to evolve as a third-degree polynomial). The results were not terribly sensitive to the presence of cyclical variables; I report results based on a specification that includes GROW and GROW(-1). I have plotted the estimated coeffi-
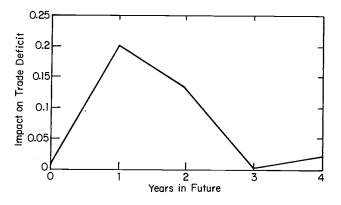
FIGURE 5. *The Effect of Budget Deficits on Subsequent Trade Deficits*

cients in Figure 5. One interprets this figure as follows. When one controls for previous fiscal policy, there is little if any concurrent relationship between budget deficits and trade deficits. Most of the impact of the budget deficit is felt one year later, and a substantial effect follows after two years. Note that the coefficients for budget deficits three and four years in the past are essentially zero (I should emphasize that I did not constrain the fourth lagged coefficient to equal zero)—all of the effects of fiscal policy on trade are felt within two years. By summing the coefficients for the current and lagged budget variables, I obtain an estimate of the total effect that a sustained deficit policy would eventually have on the current account balance. The sum of these coefficients is 0.366, with a standard error of 0.117 (this indicates that, with 95 percent probability, the true sum of these coefficients lies between 0.13 and 0.60). Thus, a permanent increase in the annual budget deficit of $1 is associated with a permanent $0.366 increase in the annual trade deficit.

I also estimated a specification that included all of the explanatory variables described above—a polynomial distributed lag on BSUR, GROW, GROW(-1), and GOV. This specification has the advantage of controlling for both cyclical effects and government spending while simultaneously allowing for lagged fiscal effects. It is therefore noteworthy that this procedure generated the most striking results: the coefficients on the current and lagged values of BSUR summed to 0.628, with a standard deviation of 0.107.

In summary, the data for the United States indicate that there is a strong, stable relationship between the budget deficit and the trade deficit. Once one allows for the fact that international capital markets may adjust slowly,
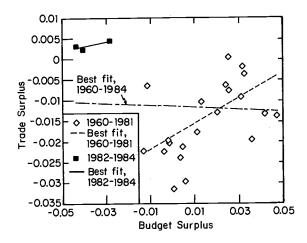
FIGURE 6. *Scatter Plot for Canada 1960–1984*

the total effect estimated from U.S. data is roughly comparable to that obtained from the international comparison.

6. THE EXPERIENCES OF OTHER COUNTRIES

In this section I analyze time series data from the five largest U.S. trading partners (measured by U.S. exports) in order to determine whether trade deficits are systematically related to budget deficits.

6.1 Canada

In Figure 6, I plot the Canadian trade surplus against the Canadian budget surplus in a scatter diagram. Taken as whole, the data do not appear to reveal any clear pattern. Indeed, the best-fit regression line for the entire period is slightly downward sloping. This is anomalous, because a downward slope would imply that budget deficits actually improve the balance of trade. On the other hand, the coefficient is very small and statistically indistinguishable from zero.

The absence of a clear pattern may simply reflect the influences of various third factors. If it is known that such factors led to atypical behavior in specific years, then one should minimize the importance of those years when searching for systematic relationships.

In the case of Canada, there are three years in which behavior was almost certainly atypical: 1982, 1983, and 1984. I have already mentioned in section 3 that the U.S. began to run very large budget deficits in 1982. Since Canadian trade is dominated by the United States (for example, in 1986
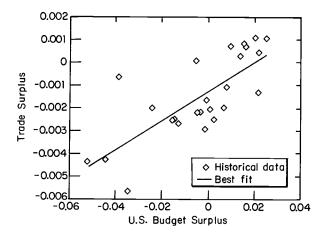
FIGURE 7. *Bilateral Trade Balance between United States and Canada 1960–1984*

three-fourths of all Canadian exports were destined for the United States), one would naturally expect the Canadian current account balance to be very sensitive to U.S. fiscal policy. Indeed, as noted in Figure 6, these three years witnessed abnormally high current account surpluses (they correspond to the three outliers in the upper left-hand corner of the diagram). It is therefore possible that the favorable current account balances beginning in 1982 simply reflect the effects of U.S. budget deficits.

To investigate this hypothesis, I analyze time series data on bilateral trade between the United States and Canada. In Figure 7, I plot the bilateral trade surplus for the United States (as a fraction of U.S. GDP) against the U.S. budget deficit. Note that the data show a clear relationship between the variables of interest. The only significant outliers are, as in section 5, 1975 and 1984. The large U.S. bilateral trade deficits with Canada in 1982 and 1983 are not at all abnormal, given the U.S. fiscal policy in those years.

The question remains: can the effects of U.S. fiscal policy on bilateral trade explain the three outliers in Figure 6? To answer this question, I measure the effect of U.S. budget deficits on bilateral trade by computing the least squares regression line for the data points in Figure 7. I find that a $1 budget deficit is associated with a $0.064 increase in the bilateral trade deficit for the United States. This coefficient has a standard error of $0.011, which indicates that it is estimated very precisely.

There are, of course, several problems with this measure of U.S. fiscal policy effects. First, bilateral trade between the United States and Canada should be affected by U.S. budget surpluses and by Canadian budget

surpluses. To the extent fiscal policies are correlated across countries, a simple regression of the bilateral balance on the U.S. budget surplus will confound the effects of U.S. and Canadian policy. It is therefore necessary to control for the Canadian budget surplus. Second, as before, systematic variation over the business cycle may produce a spurious correlation between the variables of interest. Accordingly, I regress the bilateral trade surplus as a fraction of U.S. GDP (BTS) on the U.S. budget surplus (BSURUS), the Canadian budget surplus (BSURC), and current and lagged values of the real GDP growth rates for the United States and Canada (GROWUS and GROWC, respectively). I obtain the following estimates:

$$BTS = -0.0003 + 0.085 \times BSURUS + 0.004 \times BSURC + 0.0001 \times GROWUS$$
$$\quad\;\; (0.001) \quad (0.024) \qquad\qquad (0.026) \qquad\qquad (0.0002)$$

$$\quad -0.0004 \times GROWUS(-1) - 0.0002 \times GROWC + 0.0002 \times GROWC(-1)$$
$$\quad\;\;\, (0.0002) \qquad\qquad\qquad (0.0003) \qquad\qquad (0.0002)$$

$$R^2 = 0.662$$

Note that, after controlling for Canadian fiscal policy and business fluctuations, I find an even larger effect of U.S. budget deficits on the bilateral trade surplus ($0.085 on the dollar rather than $0.064). The only anomalous result is that BSURC is positive. Note, however, that this coefficient is dwarfed by its standard error, so that one cannot reject the possibility that it is negative with any degree of statistical confidence. Indeed, one can only conclude that, with 95 percent probability, the true coefficient lies between -0.048 and 0.056. These values may appear small in absolute value: since U.S.–Canadian trade is larger relative to total trade for Canada than it is for the United States, one would expect a $1 increase in the Canadian budget deficit to have a larger effect on bilateral trade than would a $1 increase in the U.S. budget deficit. However, one must bear in mind that the Canadian budget surplus is measured relative to Canadian GDP, and all other variables are measured relative to U.S. GDP. Since U.S. GDP is roughly eleven times as large as Canadian GDP, a coefficient of, say, -0.02 would imply that a $1 increase in the Canadian budget deficit would increase net imports from the United States by about $0.22. Thus, plausible fiscal effects are within one standard deviation of the estimated coefficient. The data simply do not allow us to distinguish between interesting hypotheses concerning the impact of Canadian budget deficits. Also if one allows for lagged fiscal effects by incorporating polynomial distributed lags on the budget surplus variables, the estimated cumulative

effect of the Canadian budget surplus becomes negative, although its standard error remains quite large (the measured cumulative effect of U.S. budget surpluses rises to more than $0.11 on the dollar).

What do these estimates imply about the effects of U.S. budget deficits in the early 1980s? Prior to 1982, the U.S. budget deficit for the most part remained below 2 percent of GDP; from 1982 to 1984, it increased to 4 or 5 percent of GDP. Accordingly, the change in U.S. fiscal policy probably caused the bilateral U.S. trade deficit with Canada to rise by about 0.25 percent of U.S. GDP. This is equivalent to about 2.8 percent of Canadian GDP.

Now return to Figure 6. Note that I have plotted least squares regression lines for each of two subperiods: 1960–1981 and 1982–1984. Observe also that the vertical distance between the leftmost tip of the former and the rightmost tip of the latter is about 0.03 (3 percent of Canadian GDP). The arguments in the preceding paragraph therefore establish that U.S. fiscal policy can account for virtually all of the favorable shift in the Canadian balance of payments between the first and second subperiods.

Since it is possible to account reasonably well for the three outliers in the manner described above, it seems likely that one would obtain the best measure of the relationship between Canadian budget deficits and trade deficits by focusing on the period 1960 to 1981. It is therefore noteworthy that the slope of the regression line for this subperiod is 0.310, with a standard error of 0.109. This is virtually identical to the effect obtained for the United States in section 5. Note that the regression line for 1982 to 1984 also has a positive slope. The relationship simply appears to have shifted upward. Unfortunately, it is impossible to estimate this slope precisely with only three data points, so this conclusion is extremely tenuous.

Once again, it is desirable to improve this estimate by controlling for the effects of business cycle fluctuations. Accordingly, I regress the Canadian current account surplus (CAS) on the Canadian budget surplus (BSUR), and current and lagged values of real GDP growth for Canada (GROW) for the sample period 1960 to 1981. The estimated coefficients are

$$CAS = -\ 0.019 + 0.310 \times BSUR + 0.0001 \times GROW - 0.0001 \times GROW(-1) + \varepsilon$$
$$\quad\ (0.008)\ \ (0.169)\qquad\quad (0.0012)\qquad\qquad (0.0013)$$

$$R^2 = 0.289$$

Thus, the inclusion of cyclical variables has virtually no impact on the estimated coefficient of BSUR (although its standard error does rise). The addition of GROW(−2) to the list of explanatory variables reduces the

coefficient of BSUR slightly; the addition of GROW(−2) and GROW(−3) raises it to 0.418, with a standard error of 0.202.

Similarly, one should control for the potentially spurious effects of government consumption. For each of the specifications mentioned above, the addition of Canadian government consumption (GOV) as an explanatory variable reduces the measured effect of budget deficits only slightly, by approximately $0.02 to $0.03 on the dollar.

As with the United States, it is also desirable to examine the timing of Canadian fiscal effects. To do so, I follow the procedure outlined in section 5, adding four lagged values of the Canadian budget surplus and conserving degrees of freedom by requiring the corresponding coefficients to evolve as a third-degree polynomial. This procedure yields cumulative fiscal effects that are larger than the contemporaneous effects discussed above (for example, with GROW and GROW(−1) the cumulative effect of BSUR is 0.424). Unfortunately, the standard errors increase significantly (to 0.263 for the coefficient of BSUR in the specification mentioned above). In addition, the pattern of lagged coefficients is peculiar. The contemporaneous coefficient is, in general, very close to the cumulative effect, which suggests that most of the impact is felt immediately. However, although the cumulative lagged effect is typically close to zero, coefficients on individual terms vary substantially. This evidence is somewhat ambiguous, but I am inclined to conclude that Canadian fiscal effects are primarily contemporaneous. This contrasts sharply with the U.S. experience.

One possible explanation for this difference is that the U.S. and Canadian capital markets are very highly integrated, and the U. S. economy is roughly eleven times as large as that of Canada. When saving falls short of investment in Canada, funds from the United States can easily make up the difference. Conversely, when Canadian saving exceeds investment, the U.S. can easily absorb the residual. Furthermore, due to the high degree of integration, this happens very quickly. On the other hand, when saving is either high or low relative to investment in the United States, Canada is simply too small to supply or absorb the residual funds. Instead, the rest of the world must play that role. Since U.S. capital markets are generally less well integrated with those of countries other than Canada, this tends to occur after a lag.

In summary, when analyzing data on Canadian trade, one must explicitly allow for the important roles played by the United States and its fiscal policy. Having done this, it is evident that there is a significant relationship between the budget deficit and the trade deficit in Canada, and that the magnitude of fiscal policy effects are roughly the same as in the United States.
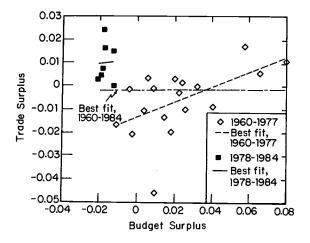
FIGURE 8. *Scatter Plot for the United Kingdom 1960–1984*

6.2 *The United Kingdom*

In Figure 8, I plot the British trade surplus against the British budget surplus in a scatter diagram. As with Canada, the data do not initially appear to reveal any clear pattern. Indeed, the least squares regression line is flat, raising the possibility that one of the two conditions discussed in section 2 holds for the United Kingdom.

Upon closer inspection, systematic patterns are evident. As before, my strategy is to identify years in which, on the basis of other information about the British economy, one would have expected to find atypical behavior. In the case of the United Kingdom, there are some obvious candidates. In particular, there were three developments in the late 1970s that could well have changed the basic structural relationship between current account surpluses and budget deficits in Great Britain. The first development was that Britain began to pump oil in the North Sea and thus became a major oil exporter. The second development was the oil crisis of 1979, which, combined with the first development, vastly improved Britain's terms of trade. The third and final development was the election of Thatcher's conservative government. For reasons entirely unrelated to the factors that improved Britain's current account, Thatcher attempted to stimulate Britain's economy by reducing taxes. Although the resulting deficits coincided with current account surpluses, it seems highly likely that these surpluses occurred for independent reasons, and would have been much larger in the absence of the deficits.

In view of these developments, it is natural to divide the sample into two subperiods: 1960–1977 and 1978–1984. During the first subperiod, there is a clear relationship between fiscal policy and the balance of trade. Indeed, the least squares regression line has a slope of 0.326, with a standard error of 0.121. Thus, a $1 increase in the budget deficit is associated with a $0.326 increase in the trade deficit. This result coincides almost exactly with those obtained for the United States and Canada, and is only slightly below the estimate based upon my comparison of ten-year averages across the six countries in my sample.

It is once again desirable to attempt to control for third factors that might have produced a spurious correlation between British trade and fiscal policy. Following the strategy used in earlier sections, I control for business cycle fluctuations by regressing the British current account surplus (CAS) on the British budget surplus (BSUR), along with the current and lagged values of real GDP growth (GROW) for the period 1960 to 1977. The estimated coefficients are

$$CAS = -0.013 + 0.322 \times BSUR - 0.0008 \times GROW + 0.0006 \times GROW(-1) + \varepsilon$$
$$\quad\;\; (0.006) \quad (0.119) \qquad\quad (0.0009) \qquad\qquad (0.0009)$$

$$R^2 = 0.445$$

The inclusion of additional cyclical variables (lagged values of GROW) actually increases the measured coefficient of BSUR and reduces its standard error. For example, when one adds GROW(−2) and GROW(−3) to the list of explanatory variables, the coefficient rises to 0.369, with a standard deviation of 0.090.

I have also estimated several specifications in which I controlled for government consumption (GOV), as well as for cyclical effects. As with Canada, the impact of including GOV was to reduce slightly the measured impact of budget deficits on the current account balance (in this case, by approximately $0.06 on the dollar). The coefficient of BSUR remained significant at conventional levels of confidence.

It is desirable to examine the importance of lagged fiscal effects as in the preceding sections; however, this is impossible for Great Britain. The inclusion of four lags would require me to drop the first four years of data. Since I have truncated the sample at 1977, this leaves only fourteen data points. Estimation of an intercept as well as coefficients for fiscal variables (current and lagged values of BSUR) and cyclical variables (current and lagged values of GROW) would leave only seven degrees of freedom. In practice, the residual variation in the data is insufficient to identify this set of coefficients with any precision.

So far, I have confined attention to 1960 to 1977. Returning to Figure 8, note that the least squares regression line for 1978 to 1984 also slopes downward, but the slope coefficient is very small and estimated very imprecisely. During this period there simply was not very much variation in the ratio of budget deficits to GDP, so recent experience in the United Kingdom can tell us little about the effects of fiscal policy. Variation in the current account balance undoubtedly arose from other sources, such as movements in the price of oil.

In summary, Britain exhibits a clear relationship between budget deficits and trade deficits through 1977. The magnitude of these fiscal policy effects appears to be roughly the same as for the United States and Canada, and is only slightly lower than the figure obtained from an international comparison. Due to developments in the late 1970s, Britain began to run large budget deficits along with current account surpluses for completely unrelated reasons. Variation in British fiscal policy since 1977 is insufficient to allow precise measurement of fiscal effects.

6.3 West Germany

In Figure 9 I plot the German trade surplus against the German budget surplus in a scatter diagram. To the extent there is a significant relationship between fiscal policy and trade, it is obscured by the degree of variation in the current account balance. Although the least squares regression line for Germany is slightly upward sloping, it appears that many other lines would fit the data almost equally well. More formally, the slope coefficient
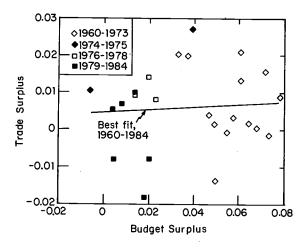

FIGURE 9. *Scatter Plot for Germany 1960–1984*

is 0.0185, with a standard deviation of 0.0872. Thus, the data are consistent with the hypothesis that there is no systematic relationship between the budget surplus and the trade surplus. However, the data are also consistent with the hypothesis that a \$1 increase in the budget deficit causes the trade deficit to rise by nearly \$0.20. Evidently, the variation in the German current account balance arising from third factors is too large to allow us to differentiate between the various hypotheses of interest.

As in the preceding sections, one can use other information to identify years in which the behavior of the German current account might be considered atypical. The most plausible candidates are years in which the German economy suffered from the effects of the two oil crises. In Figure 9 I have separately identified data points from each of four subperiods: 1960–1973, 1974, and 1975 (the first oil crisis), 1976–1978 (the period between the oil crises), and 1979–1984 (the second oil crisis and its aftermath). It is possible to account for some of the current account variation in this way. For example, German trade deficits were concentrated in the years 1979–1981, at the height of the second oil crisis. This is understandable, since Germany imports most of its primary materials. One apparent anomaly is that Germany ran its largest current account surplus in 1975, during the first oil crisis. This is probably because the crisis induced a recession, and German investment was very slow to recover. In the meantime, savings flowed to other countries, producing a large current account surplus in response. Nevertheless, even after allowing for atypical behavior in the oil crisis years, no clear pattern emerges.

It is also possible that cyclical variation in the budget deficit and current account balance obscures an underlying relationship between these two variables. Following the strategy adopted in earlier sections, I control for business cycle effects by regressing the current account surplus (CAS) on the budget surplus (BSUR), and current and lagged values of real GDP growth (GROW). The estimated coefficients are

$$CAS = 0.0057 + 0.189 \times BSUR - 0.0005 \times GROW - 0.0016 \times GROW(-1) + \varepsilon$$
$$\quad\quad (0.0041) \quad (0.166) \quad\quad\quad (0.0011) \quad\quad\quad\quad (0.0012)$$

$$R^2 = 0.083$$

Note that the coefficient of BSUR increases substantially to 0.189. Its standard error is still relatively large, but the movement in this coefficient suggests that cyclical fluctuations bias the coefficient of BSUR downward. Although I have noted a similar bias in previous sections, the effect here is far larger and hence much more important. The direction of this bias

should not be surprising: during booms, rising income generates increased tax revenues and hence reduces deficits; at the same time the demand for imports rises with disposable income, contributing to a deterioration of the balance of payments.

Since cyclical fluctuations are evidently very important for West Germany, it is important to determine whether a single lagged value of GROW fully controls for factors that induce the spurious correlation. Accordingly, I also estimate specifications in which I include additional lagged values of GROW as explanatory variables. The addition of GROW(-2) raises the estimated coefficient of BSUR to 0.330 (with a standard deviation of 0.205); the addition of both GROW(-2) and GROW(-3) raises the coefficient to 0.547 (with a standard error of 0.240). Note that this last coefficient is statistically significant at conventional levels of confidence. Thus, as one controls more completely for business fluctuations, the observed relationship between budget deficits and trade deficits becomes stronger.

As in previous sections, it is also important to control for the effects of government spending. The addition of the government consumption variable (GOV) to the specifications discussed above causes the coefficient of BSUR to decline slightly (e.g., by $0.02, $0.06, and $0.09 on the dollar, respectively, for the specifications with one, two, and three lagged values of GROW). The overall relationship between budget deficits and trade deficits remains quantitatively large.

Finally, it is useful to explore the effects of fiscal policy on German trade patterns through time. I follow the strategy adopted in previous sections, adding four lagged values of the budget surplus as explanatory variables and constraining the lagged coefficients to evolve as a polynomial distributed lag. The estimated cumulative effect of BSUR on CAS is much larger than the contemporaneous effect discussed above: with one lagged value of GROW, it is 0.542 (with a standard deviation of 0.181); with two lagged values of GROW, it is 0.603 (with a standard deviation of 0.221). However, as with Canada, the pattern of lagged coefficients is somewhat peculiar— the coefficient on the current value of BSUR is virtually equal to the cumulative effect, and coefficients on the lagged variables vary between fairly large positive and negative numbers, with no apparent pattern. Although this evidence is somewhat ambiguous, I am inclined to conclude that West German fiscal effects are primarily contemporaneous.

In summary, business fluctuations appear to obscure a systematic relationship between budget deficits and trade deficits in West Germany. When one controls for such effects, the impact of fiscal policy on the current account appears to be as large, if not larger, for West Germany as it is for the countries considered in previous sections.
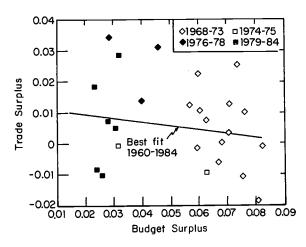
FIGURE 10. *Scatter Plot for Japan 1960–1984*

6.4 *Japan*

In Figure 10 I plot the Japanese trade surplus against the Japanese budget surplus in a scatter diagram. The data appear to rule out the existence of a significant positive relationship between these two variables. The slope coefficient of the least squares regression line is −0.125, with a standard error of 0.109. This estimate is inconsistent with the view that Japanese budget surplus significantly contributes to Japanese trade surpluses.

Unlike Germany, the Japanese government takes a strongly interventionist role with respect to international trade. Japan has traditionally regulated imports, exports, and capital flows. The absence of a strong relationship in Figure 10 may reflect the relative importance of these other interventionist policies in determining the Japanese current account balance.

Once again one can attempt to account for the lack of a clear relationship by using other information to identify years in which behavior was probably atypical. However, as with Germany, this effort meets with very little success. In Figure 10 I have separately identified data points for each of the subperiods described in section 6.3. As expected, one sees deteriorating current account balances during periods of high oil prices (1974, 1975, and 1979–1981), reflecting Japan's status as a major oil importer. Yet no clear pattern emerges even when these years are deleted.

In view of my results concerning West Germany, it is extremely important to control for the effects of business cycles. Yet even when one regresses the Japanese current account surplus on the Japanese budget

surplus and current and lagged values of real GDP growth, fiscal effects of the sort observed in previous sections fail to materialize. In all specifications, the coefficient of BSUR remains negative, although it is never significant at conventional levels of statistical confidence. The addition of a government consumption variable (GOV) does not alter this conclusion, nor does the estimation of polynomial distributed lags.

We can gain some insight into the Japanese experience by referring again to Figure 10. This diagram reveals a cleavage between a large group of high budget surplus years (in which surpluses ranged from about 6 to 8 percent of GDP) and a large group of low budget surplus years (in which surpluses ranged from about 2 to about 4 percent of GDP). As it happens, the first group of points represent the years 1960–1974, and the second group represent 1975–1984. Apparently, high prices for primary goods during the first oil crisis forced the Japanese government to reduce its budget surpluses, and since then Japan has never reestablished its previous levels of fiscal restraint. Note that within each of these subperiods the variation in budget deficits is very small relative to the variation in the Japanese current account balance. Thus, within-period movements in these variables are insufficient to establish the magnitude of fiscal effects. The slope of the regression line is primarily determined by differences in averages before and after the cleavage. Because the late 1970s and early 1980s differed in a large number of important respects from the 1960s and early 1970s, this observation casts doubt on the validity of the finding that fiscal effects are insignificant in Japan. It does not, however, establish that the data support the existence of large fiscal effects.

In summary, the data for Japan appear to support the view that budget deficits do not cause significant deterioration of the current account. Nevertheless, this finding is primarily derived from a comparison of the average Japanese experience before and after 1975, and may reflect spurious factors.

6.5 Mexico

In Figure 11 I plot the Mexican trade surplus against the Mexican budget surplus in a scatter diagram. As with Canada, the United Kingdom, and West Germany, the data do not, as a whole, reveal any clear pattern. In fact, the least squares regression line for the entire period is absolutely flat. This appears to suggest that budget deficits have no effect on trade, and that Mexico satisfies one of the two conditions discussed in section 2.

Upon closer inspection, one quickly sees that this conclusion is unfounded. Other information strongly suggests that the events of the early 1980s was extremely atypical, and that the Mexican current account balance was primarily determined by spurious third factors. In particular, Mexico
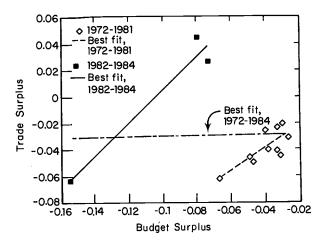
FIGURE 11. *Scatter Plot for Mexico 1972–1984*

experienced a foreign debt crisis in 1982. This led to a virtual suspension of foreign credit and to the adoption of a rather severe austerity program. The resulting sharp decline of capital inflows produced a dramatic improvement in the Mexican current account, completely independently of any ordinary economic influences. At the same time it was generally believed that the Mexican government would be tempted to monetize a substantial fraction of its outstanding debt. This expectation undoubtedly resulted in a devaluation of the Mexican currency, which led to a further improvement in the current account. Thus, fears of monetization may have produced a spurious relationship between budget deficits and the current account surplus during a period in which net exports were already artificially high.

Not surprisingly, the data points corresponding to 1982, 1983, and 1984 appear as extreme outliers in Figure 11. The remaining points are closely grouped together and give clear evidence of a strong positive relationship between the Mexican budget deficit and trade deficit. The slope of the least squares regression line for this subperiod is 0.853. Although it is estimated somewhat imprecisely (a standard error of 0.251), one can nevertheless conclude that the slope of the true relationship lies between 0.35 and 1.35. Note that even the lower end of this range exceeds the point estimates for the United States and Canada.

As in the preceding sections, it is desirable to control for the effects of business cycle fluctuations. A regression of the Mexican current account surplus (CAS) on the Mexican budget surplus (BSUR) and current and

lagged values of real GDP growth (GROW) yields the following coefficients:

$$CAS = 0.002 + 0.749 \times BSUR + 0.0001 \times GROW - 0.0016 \times GROW(-1) + \varepsilon$$
$$ (0.017) \quad (0.302) (0.0018) (0.0017)$$

$$R^2 = 0.653$$

Although the inclusion of proxies for the business cycle somewhat reduces the coefficient of BSUR, the estimated fiscal effect remains extremely large. This conclusion holds up when one adds GROW(−2) and GROW(−3) to the list of explanatory variables.

As with Canada, the United Kingdom, and West Germany, the inclusion of a measure of government consumption (GOV) reduces the estimated fiscal effect. In a regression of CAS on BSUR, GROW, GROW(−1), and GOV, the coefficient of BSUR was 0.557, with a standard error of 0.257. Despite this reduction, the coefficient remains quite large.

Because data on Mexico are unavailable before 1972, the Mexican time series is extremely short. It is therefore impossible to determine the lagged effects of fiscal policies through the estimation of polynomial distributed lags.

Why should the effect of fiscal policy be so much larger in Mexico than in the United States or Canada ? Recall from the discussion in section 2 that the magnitude of the fiscal effect depends in large part upon the extent to which consumers spend out of increases in disposable income. For a relatively poor country like Mexico, this propensity to consume may be extremely high. Indeed, many consumers may save nothing at all. As a result, a $1 tax cut may cause consumption to rise (and national saving to fall) by nearly $1. Foreign funds are required to make up the difference, and the current account adjusts accordingly.

Turning to the data for the early 1980s, note finally that the least squares regression line for 1982 to 1984 is roughly parallel to the line for 1960 to 1981. As with Canada, the relationship between the budget surplus and trade surplus simply seems to have shifted upward toward a more favorable balance of payments, although once again it is impossible to draw any clear inferences on the basis of three data points.

In summary, the Mexican economy exhibited a strong and clear relationship between the budget deficit and the current account through 1981. Quantitatively, the effects of fiscal policy on patterns of trade were significantly larger for Mexico than for any of the other countries considered. After 1981 these effects were obscured by the Mexican debt crisis.

7. CONCLUSIONS

Analysis of time series data for six countries reveals a robust and significant link between fiscal policy and trade deficits. For the United States, Canada, the United Kingdom, and West Germany, a $1 increase in the budget deficit is associated with roughly a $0.30 decline in the current account surplus. A cross-country comparison produces a slightly higher figure ($0.40). Fiscal effects are substantially larger for Mexico (perhaps as much as $0.85 on the dollar). No fiscal effects are evident for Japan, but this evidence is very weak.

At this point there is a very large empirical literature on the economic effects of government budget deficits. It is useful to review these findings in the context of this literature in order to produce a coherent view of fiscal policy. I recently reviewed this literature (see Bernheim (1987)) and reached the following conclusions. First, a number of studies have identified a strong positive relationship between fiscal deficits and private consumption. This finding is extremely robust. Generally, most studies estimate that the effect of increasing the deficit by $1 is to raise private consumption by about $0.30. Second, the evidence on the relationship between budget deficits and the interest rate is extremely mixed. No one has yet made a compelling empirical case for the view that budget deficits significantly raise interest rates.

Both of these conclusions are consistent with my current findings. If we suppose that international capital markets work reasonably well (and recall that there is an independent body of research that, on balance, supports this view), then budget deficits should not alter domestic investment. In fact, interest rates will be largely determined in the world capital market. It is therefore not at all surprising that various economists have been unable to identify a robust empirical relationship between fiscal policy and interest rates. On the other hand, government borrowing does depress national saving. If we take this effect to be $0.30 on the dollar (as suggested in the preceding paragraph) and suppose that investment remains fixed, we are led to the conclusion that a $1 increase in the budget deficit attracts $0.30 of investment funds from abroad, creating an offsetting $0.30 movement in the current account. This is exactly the magnitude of the effect that I have estimated here.

Only one anomaly remains. In a recent paper, Evans (1986) has argued that there is no empirical relationship between budget deficits and exchange rates. This is troublesome because the economic mechanism described in section 2 hypothesized that the current account would deteriorate in response to an appreciation of the domestic currency.

Evans's results are, however, contradicted by Feldstein (1986), who finds that the value of the dollar rises significantly in response to budget deficits.

REFERENCES

Barro, Robert J. 1974. Are government bonds net wealth? *Journal of Political Economy* 82.

Bernheim, B. Douglas. 1987. Ricardian equivalence: an evaluation of theory and evidence. *NBER Macroeconomics Annual* 2. Forthcoming.

Boskin, Michael J., and John M. Roberts. 1986. A closer look at saving rates in the United States and Japan. Stanford University, mimeo.

Branson, William H. 1985. Causes of appreciation and volatility of the dollar. In *The U.S. dollar—recent developments, outlook and policy options*, symposium sponsored by the Federal Reserve Bank of Kansas City.

Eisner, Robert. 1986. *How real is the federal deficit?* New York: The Free Press.

Evans, Paul. 1986. Is the dollar high because of large budget deficits? *Journal of Monetary Economics* 18: 227–49.

Feldstein, Martin. 1983. Domestic saving and international capital movements in the long run and the short run, *European Economic Review* 21: 129–51.

———. 1986. The budget deficit and the dollar. NBER Working Paper no. 1898.

Feldstein, Martin, and Charles Horioka. 1980. Domestic saving and international capital flows. *Economic Journal* 90: 314–29.

Frankel, Jeffrey. 1986. International capital mobility and crowding-out in the U.S. economy: Imperfect integration of financial markets or goods markets? In *How open is the U.S. economy?*, ed. R. W. Hafer. Lexington Books: Lexington, Mass.

Harberger, A. C. 1978. Perspectives on capital and technology in less developed countries. In *Contemporary economic analysis*, eds. M. J. Artis and A. R. Nobay. London.

———. 1980. Vignettes on the world capital market. *American Economic Review* 70: 331–37.

Helliwell, John. 1987. Some comparative macroeconomics of the United States, Japan, and Canada. University of British Columbia, mimeo.

Milne, Elizabeth S. 1977. The fiscal approach to the balance of payments. *Economic Notes* 6: 889–908.

Obstfeld, Maurice. 1986. Capital mobility in the world economy: Theory and measurement. *Carnegie-Rochester Conference Series on Public Policy* 24: 55–104.

Sachs, Jeffrey D. 1981. The current account and macroeconomic adjustment in the 1970s. *Brookings Papers on Economic Activity* 12: 201–68.

Summers, Lawrence H. 1986a. Tax policy and international competitiveness. Harvard Institute of Economic Research Discussion Paper no. 1256.

———. 1986b. Debt problems and macroeconomic policies. Harvard Institute of Economic Research Discussion Paper no. 1272.