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THE INTERNATIONALIZATION OF  
AMERICAN BANKING AND FINANCE:  
STRUCTURE, RISK, AND  
WORLD INTEREST RATES

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ABSTRACT

The transformation of American banking from the parochialism of 1960 to the internationally linked structure of the 1980s is analyzed and detailed quantitatively. While the liberalization of trade and the existence of and changes in financial regulations profoundly affected the pace and order of this transformation, it is argued that international banking is the historic norm. International banking on the one hand provides the opportunity to banks to diversify their portfolio, but may simultaneously expose them to increased systematic risk, especially with regards to movements in the U.S. real interest rate. Deposit insurance provides an incentive for banks to take on such priced systematic risk with welfare costs which must be balanced against the welfare gains from the insurance. The paper closes with an exploration of the nature of the linkage of major movements in real interest rates and exchange rates. Further research seems warranted on monetary-policy-regime changes and investment-demand shifts as a result of changes in tax, regulatory, and political climate.

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THE INTERNATIONALIZATION OF AMERICAN BANKING AND FINANCE:

STRUCTURE, RISK, AND WORLD INTEREST RATES

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The American banking industry has suffered major losses in the 1980s related to foreign, agricultural, and petroleum-industry loans. This paper is concerned primarily with the former losses although agricultural distress is certainly related to the exchange rate movements which have been so damaging to foreign borrowers. Three related topics are examined with respect to the nature of foreign losses: (a) the institutional transformation which made the major U.S. banks a part of an international banking system and, at the same time, exposed to potentially major foreign losses; (b) the nature of the bank's foreign risk -- in particular, the macroeconomic factors which can be related to the systematic, nondiversifiable portion of that risk; and (c) possible fundamental explanations of the movements in these basic macroeconomic factors. I believe that this triad offers a framework for understanding why foreign loan losses now are an unprecedented problem for U.S. Banks.

In 1960 American banks' international operations were largely limited to financing international trade. During the 1960s and early 1970s American banks began to go offshore in large numbers primarily to avoid certain banking regulations, taxes, and capital controls. Subsequent to the breakdown of the Bretton Woods system, general relaxation of capital controls initiated a new era of international banking.

In a broader context, American banks may be viewed as taking a leading role in the reinternationalization of banking since, for the century before the onset of World War I, European and especially English banks played an important part in the operation of a world capital market.<sup>1</sup> Government controls on international capital flows and sometimes on convertibility reduced the role of international banking during the era 1914-1960.<sup>2</sup> Thus on a longer term view, international banking can be seen as the norm, rather than an unprecedented development.

Expanded international banking can be understood as concomitant to growth in international trade and capital flows. Exchanging moneys and financing goods in transit was once the essence of international banking, but other activities have become increasingly important: bank lending to foreign firms and governments provides a more flexible and possibly safer channel for international capital flows than securities sales;<sup>3</sup> foreign deposit taking activities have in some cases represented an attempt to broaden the scope of comparative advantage in provision of consumer financial services;<sup>4</sup> international banks are the dominant players in integrated international financial markets including the Eurocurrency, Eurobond and foreign-exchange markets; international banks provide services such as funds positioning and transfer to multinational corporations; and international banking has been an avenue for the entrance of American banks into investment banking.

Economists might want to explain international banking in terms of facilitating the flow of capital from high-saving to low-saving countries and of exercising comparative advantage in provision of banking services. Neither of these explanations seem to help much in explaining why American banks from a low-saving country would play a leading role in international lending nor in why foreign banks have entered the American banking market with great success. I believe that other important forces in the internalization of American banking include the special strengths of particular banks, advantages of international diversification, and avoidance or exploitation of regulatory and tax provisions. Of course, much of today's international banking -- like international trade -- could not exist without modern communications.

The paper is organized into three main sections: the first provides historical background and a survey of the current extent of internationalization of American banking. The second considers the risks of international lending within the broader context of the banking institution's portfolio. The third section considers factors affecting the American real interest rate and its influence on foreign capital markets. Conclusions are drawn in a final section.

### **I. The Internationalization of the American Banking System**

In 1960, it was fair to characterize the American banking system as essentially local in character. American banks were limited, depending on the state in which they operated, to one office, one city, or at most one state. A bank's assets and liabilities were largely limited to the immediate geographical region of the bank. Local banking markets were linked through national trading in government and other debt securities, a system of correspondent relationships, an emerging interbank Federal Funds market, and large national corporations which would maintain banking relationships in different

communities in which they operated.<sup>5</sup>

The banking industry could be characterized as consisting of two groups: large banks which desired deregulation so that they could exercise their expertise over a broader range of geography and services and small banks which enjoyed the quiet life made possible by local monopolies and oligopolies. Since 1960 the balance of power has very definitely shifted away from the numerous smaller banks. It is beyond the scope of the current paper to develop the reasons for that shift, but two factors must be mentioned: Keeley (1985) demonstrates that the policies of James Saxon as Comptroller of the Currency (appointed 1961) effectively resulted in elimination of the monopoly value of a bank charter which had existed since the Banking Act of 1935. Rising inflation and hence interest rates in the 1960s and 1970s made many banking restrictions and regulations so at variance with economic reality that their elimination was accepted by even smaller banks.

The internationalization of banking in the last 25 years is part of this general struggle of large American banks to break their parochial fetters. The international arena frequently provided the cutting edge to this process as legal constraints were generally weaker there. Internationalization of American banking has to date primarily affected the wholesale market -- loans to large corporations and governments, securities, and large deposits -- but one must note the trend toward greater international and domestic competition in the consumer market and the so-called middle market of small and medium sized firms.

For present purposes, it is useful to discuss first the internationalization of American banking firms and then consider entry of foreign firms into the American banking market.

### **I.A. Internationalization of American Banking Firms**

International banking activities of American banks are primarily conducted through branches, Edge Act Corporations, and foreign subsidiaries.<sup>6</sup> Branches (and agencies which have restricted or no deposit-taking authority) are legally part of the parent bank. Edge Act Corporations permit banks expanded powers in international banking and operation for those purposes in states other than their home. Foreign subsidiaries provide U.S. banks an indigenous presence in foreign countries and may engage in activities prohibited to the U.S. bank.

The onset of American banks' foreign thrust can be attributed to avoidance of U.S. regulations. Particularly important in the 1960s were frequently binding deposit interest ceilings, reserve requirements, and various capital controls and restrictions.<sup>7</sup> Foreign expansion of American banks and the Eurodollar market which it fostered have survived the passing of all these factors, but they were nonetheless important as motivations to incur the considerable start-up costs in undertaking a foreign expansion.

Although the Federal Reserve System has gathered substantial amounts of information on foreign activities of American banks -- and American activities of foreign banks -- since 1980, there are no consistent data series going back to 1960 to indicate the changes that have occurred over the last 25 years. However, the changes in scale are so vast that the available estimates and partial data reported in Table 1 are sufficient to indicate the sweeping nature of the change that has taken place in American banks' foreign involvement.

These data on foreign branches indicate that by about 1980 the major American banks had their overseas operations in place. The decline in branch assets relative to total assets indicated for 1984 in row 5 reflects a number

of factors, some of which probably affects the recorded data more than reality. Perhaps the most important factor is the authorization of International Banking Facilities (IBF's) in December 1981. An IBF allows U.S. banks to directly participate in the Eurocurrency market; previously this could be accomplished only through foreign branches or subsidiaries. As a result the parent bank now may directly book non-U.S. resident business which might previously have been done through an offshore branch, usually a Caribbean shell.<sup>8</sup> Had the \$95.6 billion of U.S. owned IBFs' total assets at the end of 1984 been all reflected instead on the books of Caribbean branches, the branch assets would have been 24.2% of total assets.

Other factors that may have slowed growth in total assets of foreign branches since 1980 include: (1) The strength of the dollar in 1984 relative to 1980 reduced the reported dollar value of assets denominated in foreign currencies by an amount somewhere between \$25 to \$40 billion. (2) Capital adequacy guidelines that became binding in 1982 have reportedly induced some banks to reduce the denominator total assets by cutting back on relatively low profit areas such as the interbank Eurodollar market as well as encouraged off-balance sheet risks such as Note Issuance Facilities.<sup>9</sup> (3) International earnings have been less spectacular in the last five years than previously,<sup>10</sup> and this is believed to have weakened interest in foreign expansion. All of these factors notwithstanding, however, the data in rows 6-9 of Table 1 suggest continued growth in international penetration by American banks.

#### **I.B. Foreign Firms in the American Banking Market**

The internationalization of American banking has been very much a two-way street as foreign banks also have increased their presence in the American market since 1960 and at an accelerating pace in recent years. They have used the same devices as American banks: branches (and agencies), subsidiary banks



and nonbanks, and (since 1978) Edge Act corporations. Prior to the International Banking Act of 1978, foreign banks held a number of competitive advantages in the U.S. market in comparison to domestic banks. In particular, they were exempt from reserve requirements on deposits, permitted to branch across state boundaries, and underwrite and sell equities in the United States. In response to the growing presence of foreign banks, the International Banking Act of 1978 removed the exemption from reserve requirements for branches of large foreign banks and required foreign banks to designate a "home state" with branching beyond that state limited.<sup>11</sup> This Act established

...a policy of national treatment in order to promote competitive equality between domestic and foreign banking institutions in the United States. The policy of national treatment attempts to give foreign enterprises operating in a host country the same powers, and to subject them to the same obligations, as their domestic counterparts.<sup>12</sup>

Despite the limitations imposed by the 1978 law -- or, actually, its removal of previously existing advantages -- foreign operations in America have continued to grow as indicated in Tables 2 and 3. The Federal Reserve System did not begin collecting data on foreign banks until November 1972,<sup>13</sup> but a small amount of foreign banking was estimated to exist in 1966.<sup>14</sup> By the end of 1984, foreign-controlled banks were very significant factors in the overall U.S. banking market.<sup>15</sup>

Several studies have analyzed the factors which seem important in determining foreign bank entry into the American market. Goldberg and Saunders (1981) found that key determinants include the differential between U.S. and Eurodollar interest rates, the price/earnings ratios for American banks, and the size of net foreign direct investment. The first of these factors reflects the relative costs of borrowing dollars in the U.S. and abroad. The second reflects the price of entry through purchase of an existing U.S. bank. The third factor appears to reflect the value of a client base of firms

based in the same country as the foreign bank and operating in the United States.<sup>16</sup> Ball and Tschoegl (1982) examined data for existing foreign bank operations in both California and Japan and found in each case that the decision to enlarge those operations was conditioned primarily by the extent of the foreign bank's experience in California or Japan, respectively, and by the existence of other foreign operations by the bank. Walker (1983) demonstrates that growth of foreign bank offices in recent years has been greatest outside of the states of New York and California.

Where foreign banks have acquired existing U.S. banks, the acquired banks have typically been characterized by low profitability if not actual danger of failure. In many cases, foreign banks are effectively favored in acquiring such banks in comparison to domestic banks due to the interaction of antitrust laws with restrictions on interstate branching.<sup>17</sup> Houpt (1983) finds that once these banks are under foreign control, they behave very much like U.S. owned banks. However, it may take time to restore the subsidiary banks to normal levels of profitability, particularly when a large bank is acquired. Since Houpt notes that acquisition was increasingly preferred to de novo establishment of foreign-controlled U.S. banks, even troubled institutions apparently provided a more attractive entree into the U.S. market than building an entirely new operation.

Taken as a whole, the empirical evidence on foreign entry into American banking indicates that foreign banks enter to fund their dollar denominated assets more cheaply, to extend their operations by purchasing attractively priced banks, and to continue to service existing clients opening up their own operations in the United States. Although branches, agencies, and Edge Act corporations typically concentrate on the wholesale business, subsidiary banks operate very much like U.S. owned banks with profitable consumer and middle-

market banking activities. Banking skills seem to be useful wherever in the world they are put to use.

### **I.C. Summary on Internationalization of the American Banking Industry**

The last quarter of a century has seen the transformation of the American banking industry from a primarily locally owned and operating business to one in which the major firms deal internationally and compete with foreign owned firms. It is true, of course, that the vast majority of small banks are nearly as parochial as ever. However, now essentially all major banks have become part of an international banking system as opposed to the handful that could be so characterized in 1960. This transformation exposes the banking system to international risks that have not been experienced since the interwar period.

## **II. International Banking Risk**

A prime concern in America is whether or not the international activities of American banks have made them more prone to failure. An extreme version of this concern is the claim that the large banks have made the U.S. government via the Federal Deposit Insurance Corporation (F.D.I.C.) a guarantor of loans by OPEC nations to developing countries.<sup>18</sup> Bankers sometimes reply to this charge that geographic diversification should decrease, not increase risk.

In this section, I propose a framework for thinking about overall bank risk and the contribution of international activities to that risk. I believe that the best way to assess bank risk is in terms of the bank's marked-to-market equity. This concept envisions valuing all assets, liabilities, and off-balance-sheet positions of a bank at their current market value. I do not want to suggest that the F.D.I.C. will move in or depositors flee whenever this market-equity value turns negative since much of the information is private to

the bank, but this value does indicate the implications of current conditions and information for future revenues and costs. Unlike the value of the bank's stock, market-equity value can be negative because it then measures the expected loss to the F.D.I.C. if the private information were instead public.

Changes in market-equity value occur either because the banker makes a transaction for which the market values of the items bought and sold are unequal or because of subsequent changes in market conditions.

The first kind of change very much involves what is termed the business of banking. If, for example, Citicorp is correct that it has a special cost advantage in providing consumer banking services, it can increase its market equity value by acquiring a consumer bank. In this case the expected net present value to Citibank of the consumer loans is greater and consumer deposits less in comparison to the price paid. If, on the other hand, a bank does a poor job of assessing credit risks, the loans it makes will be worth less than the liabilities with which they are funded.

Thus, the market-equity value and its growth over time will reflect the business skills of the bankers. The expected growth in this value is implicitly associated with expected retained earnings while deviations from this expected growth reflect unusually good or bad fortune. A poor banker needs no bad luck in order to go broke, but we should separate a banker's acumen from the risk his bank bears.

The simplest example of risk is interest-rate risk. Because banks generally loan for longer maturity than they borrow from depositors and others, their assets will generally fall in value by more than their liabilities when interest rates rise. Unless the banker has taken offsetting positions in the financial futures markets, for example, the bank's market-equity value will fall when interest rates rise or rise when interest rates

fall.<sup>19</sup> Since society as a whole cannot diversify away interest-rate risk, banks -- or whoever lends long and borrows short -- will be compensated by an expected positive return to bearing this risk.

This indicates a general classification of risks as diversifiable or nondiversifiable or, in an alternative terminology, as idiosyncratic or systematic. Because the diversifiable or idiosyncratic risk elements in the returns of a particular claim have no effect on the average return of a well-diversified portfolio of claims, those risk elements will not be priced or compensated in terms of expected returns in efficient financial markets.<sup>20</sup> The arbitrage pricing model (APM) suggests that there may be a small number of factors which have pervasive -- that is, nondiversifiable or systematic -- effects on returns generally and that the responsiveness of returns to these common factors will be priced or reflected in the expected return to the claim.

Bankers have argued quite successfully that expanding beyond their traditional geographic boundaries has enabled them to achieve more diversified portfolios.<sup>21</sup> This reduces the overall variability in their market-equity value by averaging idiosyncratic elements at no cost in expected return. This argument is much harder to support with respect to international diversification.

### **II.A. Systematic Risk in International Banking**

Let me propose five potentially priced pervasive factors affecting returns in the world capital market generally and American banking portfolios in particular:

1. the business cycle
2. inflation
3. the real interest rate

4. the dollar exchange rate

5. the price of oil.

Because of its size, American developments apparently would dominate the development of these five factors insofar as they have pervasive nondiversifiable effects on returns.<sup>22</sup>

Since neither the business cycle nor inflation is instantaneously and perfectly transmitted between the United States and other countries,<sup>23</sup> international diversification of loans should on this account reduce both the risk and the expected return on banks. Why does this occur? Firms are more likely to fail or otherwise default on loans when they are suffering through a recession or when the inflation rate turns out to be low relative to the forecast implicit in the agreed upon interest rate. Since both developments will occur with somewhat different timing abroad than in the United States, American banks would seem to be able to achieve less bunching of defaults through international diversification. This reduction in risk of the overall portfolio would be reflected in a compensating lower average rate of return as well.

However, this pleasant story leaves out potential increases in risk because returns on foreign lending may be much more sensitive than those on domestic loans to movements in the real interest rate, the dollar exchange rate, and the price of oil.<sup>24</sup> These other factors appear to have resulted in a net increase in both risk and expected return due to the internationalization of American banking.

A specific example will help to illustrate the principle. Suppose that banks have lent to firms and governments in a number of developing countries. Normally such countries are characterized by real growth rates higher than the real interest rate on these loans. This was especially true in the 1970s when ex post real interest rates were negligible. Such countries can each year

borrow enough to pay their interest payments and finance additional investment without increasing their debt burden relative to income.<sup>25</sup> An increase in the real interest rate will result in dramatic increases in the interest burden of these developing countries and a general fall in the market value of loans to them. Thus, diversification across countries does not help when real interest rates rise. Indeed, developing countries as a group are predictably more sensitive to this sort of change than domestic borrowers.

We shall see in Section III below that increases in U.S. real interest rates were associated with appreciations of the U.S. dollar in the 1980s while increases in the U.S. real interest rate were associated with depreciations of the dollar in the 1970s. Shapiro (1985) points out that denominating bank loans to developing countries in dollars does not really avoid exchange rate risk but merely converts it to credit risk for private borrowers or country risk in the case of governments. Thus high (low) U.S. real interest rates not only directly increase (decrease) developing countries' debt problems but this effect is reinforced by the influence on the ability to repay dollar-denominated loans. Nicholas Hope of The World Bank in Boyes et al. (1986) notes that no country is likely to let its business sector be bankrupt through no fault of the borrowers, so that private loans become nationalized de jure or de facto and the risk is primarily not whether or not, but when, the principal will be repaid and with what interest.<sup>26</sup> Boessarts (1985) begins the analysis of pricing the risk that these loans are least likely to be repaid when the real interest rate is high and most likely to be repaid when the real interest rate is low.

American banks' foreign lending may also increase the risk associated with exchange-rate and oil-price changes unrelated to real-interest-rate changes, but there the case is less clear cut since these changes may affect

foreign and domestic borrowers in opposite directions. I know of no research dealing explicitly with these issues, but note that Chen, Roll, and Ross (1985) did not find evidence that these last two factors produced priced (systematic) risk in their U.S. data.

### **II.B. The Banker's Temptation**

Deposit insurance should tempt American bankers to undertake too much systematic risk. The argument is that the more the systematic risk, the greater the expected returns, and the depositors are not (sufficiently) concerned about the possibility of a negative market-equity value because the F.D.I.C. will hold them harmless.<sup>27</sup>

The implicit subsidy and incentive to risk taking increase as a bank's capital-to-deposit ratio decreases.<sup>28</sup> The "heads I win, tails you [the F.D.I.C.] lose" problem becomes quite severe when market-equity value is significantly negative, since only very risky loans have the potential of providing a positive value to the shareholders of the bank.<sup>29</sup> Crouhy and Galai (1984) have argued that the monetary authorities should coordinate capital-to-deposit requirements with the deposit insurance premium rate to avoid inappropriate taxes on or subsidies to banking through deposit insurance.

If we view bank regulation and examination as aimed at preventing the banks from taking excessive systematic risk, it is arguable that the F.D.I.C. failed in this task because its officers were not aware of the systematic risk that banks were taking in investing in a number of less developed countries.<sup>30</sup> Of course, bankers too may have been unaware of the systematic risk that was to be undertaken so that the risk was insufficiently priced. Whether bankers were tempted or mistaken remains an issue for future research. We can presume that both bankers and regulators now take account of the tendency for



international loan "defaults" to be positively correlated across countries so that international diversification may be limited in value as a tool for reducing overall portfolio risk.

### **III. The American Real Interest Rate and Foreign Capital Markets**

I have argued that the major banks have taken on systematic risk through their international lending activities. In particular, these credits are likely to experience difficulties when a rise in real interest rates and the real value of the dollar drastically increases the debt burden of developing countries. Such a rise indeed occurred in the early 1980s and had its predictable (at least with hindsight) effects. A complete analysis of the international risk of the American banking industry would explain the macro-economic sources of those changes. I believe that no definitive statement is possible yet, but instead offer some critical and speculative remarks on possible explanations of this experience.

The U.S federal budget deficit is widely supposed to be the cause of many -- if not all -- evils, including high U.S. real interest rates, an overvalued U.S. dollar, a large U.S. international trade deficit, and high real interest rates in other countries. The internationalization of American banking and finance is thought to have offset the increased independence of foreign interest rates for countries which have floating exchange rates with the dollar. These statements have been repeated so many times that it would seem that they must be true.

Unfortunately, the empirical evidence is far from overwhelming at each step in the argument; hence, the story as a whole may be surprisingly weak. In this section we first examine the evidence on the linkage of high U.S. real interest rates since 1981 to the U.S. federal budget deficit and then consider alternative explanations for high U.S. real interest rates. Next we consider

the relationship among the value of the U.S. dollar, the U.S. trade deficit, and U.S. capital flows. Finally, we consider the evidence on the impact of internationalization of banking and finance on linkages among national real interest rates.

### **III.A. The Federal Budget Deficit and U.S. Real Interest Rates**

Standard Keynesian analysis suggests that increases in government spending or reductions in taxes result in higher real interest rates. Changes in government spending directly compete with private investment so that higher real interest rates are required to choke off otherwise profitable investment projects.<sup>31</sup> Reductions in taxes -- or increases in transfer payments -- are supposed to cause increases in consumer spending which have the same effects as increases in government spending.

The recent large federal budget deficits are associated not with increased government expenditures (relative to G.N.P.) but with decreased taxes net of transfer payments, where transfer payments include, in particular, interest payments on the national debt. In marked contrast to spending increases, empirical evidence suggests that reductions in net taxes do not increase real interest rates.<sup>32</sup>

This means that when the government finances lower net taxes by higher borrowing, we do not see pressure on investment spending. This result would require that domestic saving plus capital inflows go up by the amount of the increase in borrowing. If this scenario is a correct reading of the evidence, it means that the standard argument must be wrong at least so far as it relates higher U.S. real interest rates to the U.S. budget deficit. What might explain this startling result?

### Measuring the Deficit

One set of explanations turns on problems in the way that the deficit is measured in the U.S. National Income and Product Accounts (NIPA). There are three substantial adjustments to the NIPA federal deficit that must be considered: (1) correction for inclusion of an inflation component in government interest payments, (2) adjustment for cyclical factors, and (3) offset of the large state and local government budget surplus. Table 4 illustrates that these adjustments drastically alter the magnitude of the economically relevant government deficit from somewhat more than 4 percent of GNP to less than 1 percent of GNP.<sup>33</sup>

The correction for inflation arises because NIPA includes as a transfer payment the portion of nominal interest payments required to maintain the real value of the public's debt holdings. Rational savers should recognize income only to the extent that their principal and accrued interest increases in real value over the year.<sup>34</sup>

To separate the effects of government spending and tax laws from those due to other factors, it is customary to concentrate on the structural deficit. This requires subtracting the estimated \$48 billion increase in expenditures less net taxes associated with above-normal unemployment in 1985.<sup>35</sup>

Taken together, these two adjustments amount to about \$97 billion, leaving an inflation-adjusted structural federal deficit of about \$100 billion -- still substantial but only 2 1/2 instead of 5 percent of GNP.

An alternative way to view these figures is to note that subtracting the cyclical adjustment alone leaves a structural federal deficit of about \$149 billion. This is little more than the amount of federal interest payments. So taxes are at approximately the level required to pay for federal

expenditures and transfer payments other than interest when unemployment is at normal levels. Structural borrowing is due almost solely to interest payments. While real federal interest payments (at 4 to 5% per annum) are unusually large in 1985, it is clearly awkward to say that high real interest rates are due to the high structural deficit due to the high real interest rates.

Even without adjusting the state and local government NIPA surplus for the inflation component of net interest expense and for a cyclical component, we have an offset to the federal figure of some \$58 billion. The remaining deficit is only 1 percent of GNP while the ideal figure might well indicate a small surplus.<sup>36</sup>

The ancient Greeks had a philosophy that a man must work his best to receive the rewards that gods have fated for him. This analysis suggests that despite all of President Reagan's efforts to reduce federal spending and taxes, there has been very little real impact on the overall government deficit.<sup>37</sup> Thus, it may well be that there have been no real government borrowing shocks to affect the U.S. real interest rate.

#### Ultrarationality

Even if the deficit had been increased substantially in inflation-adjusted structural terms, there is a school of thought that argues that rational consumers will save their tax cuts in the form of more government bonds. They therefore will not increase their spending as required for real interest rates to rise in the standard argument set out at the opening of Section III. The basic ideas are that increased spending would imply future decreases in consumption, and that substitution by the government of bonds for paid tax receipts does not change optimal consumption patterns over time. This viewpoint is certainly controversial but it is not without substantial

empirical support. It is included for the sake of completeness to indicate that the link between recent U.S. federal deficits and real interest rates is indeed speculative.<sup>38</sup>

#### An Alternative Explanation

I believe, therefore, that there is little empirical evidence to support either of the two standard contentions, that the U.S. budget deficit is unprecedentedly large and that this deficit decreased private saving available to support U.S. investment. Figure 1 nonetheless indicates quite clearly that the real U.S. interest rate has increased substantially since 1981.<sup>39</sup> What else can explain this sharp increase?

First let us consider exactly what the figure is saying. The line labeled  $i$  or nominal rate is the average yield on 1-year U.S. Treasury bills plotted for the second and fourth quarter of each year.<sup>40</sup> The line labeled  $r$  or tax-exempt real rate is the nominal rate minus expected inflation over the next year as measured by a semiannual survey of economists. The line labeled  $r^*$  or after-tax real rate subtracts from the tax-exempt real rate the product of the nominal rate and  $t$ , the marginal tax rate.<sup>41</sup> These relationships are summarized in Table 5.

Let us start with the after-tax real rate. This is the concept which is of most interest to a private U.S. investor, since it measures the increase in purchasing power which such an investor expects to gain. We see three distinct eras for this measure: 1960-1970, 1971-1980, 1981-1985. Compared to the first period, the middle period averages over 2 percentage points lower while the recent period averages about 1 percentage points higher. We shall see shortly that this behavior may be explicable without reference to U.S. federal budget deficits.

To move from this after-tax real rate to the nominal rate actually observed in the financial markets, we must add the three components detailed at the bottom of Figure 1: the tax due on the after-tax real rate, the expected inflation rate (Fisher effect), and the tax on the inflation rate (Darby effect).<sup>42</sup> About 2 percentage points of the increase in the tax-exempt real rate (the more commonly used measure) in 1981-1985 relative to 1960-1970 is attributable to the tax on the expected-inflation component. This tax is shifted from borrower to lender under U.S. tax law.

I believe that the remaining 1 percentage point rise in the after-tax real rate in 1981-1985 compared to 1960-1970 is well within the margin for measurement error.<sup>43</sup> The real problem is to understand why the after-tax real rate was so low during 1971-1980. I can offer no definitive solution to this problem but suggest as a working hypothesis that shifts in the investment-demand function are the most plausible explanation of major sustained movements in the real interest rate. This reflects my reading of the evidence that investment is very responsive in the long run to differences between the after-tax real yield on capital and its cost of finance.

The first possibility suggested by this working hypothesis is that the low after-tax real rate during 1971-80 reflected the slow incorporation of the accelerating inflationary trend into the investing public's consciousness. Fisher (1930) argued that this is characteristic of the effect of inflation on nominal and real rates, although it conflicts with modern notions of efficient markets.<sup>44</sup> Nonetheless, it is not necessarily irrational to put a positive probability on an event -- here, a return to low inflation rates -- even though it does not occur for a number of years in a row.<sup>45</sup> In 1980, when inflation finally passed 13 percent, this expectation of return to normalcy may well have become dominated by fears that inflation was getting completely

out of hand. It should be noted that economists who believe that the (properly measured) post-1980 after-tax real rate is high compared to the pre-1971 experience can relate this to slow adjustment of expectations in a disinflationary environment.

Another, possibly complementary explanation relates the low after-tax real rate to the political malaise and antibusiness public opinion which characterized the United States between the dawning awareness of the Vietnamese disaster and the price controls of 1971 up until the election of Ronald Reagan in the fall of 1980. That is, even if the real cost of funds was nil or slightly negative, firms might be deterred from making investments the value of which might be destroyed by some new regulation or tax. When it became apparent that Ronald Reagan would be elected in reflection of what the press characterized as the public's rejection of the failed liberal activism, America again became a good place to invest.

In these ways, the behavior of the after-tax real rate may be explained not so much by (possibly illusory) movements in the federal deficit as by problems in measuring the investing public's inflation expectations, by the political climate which can encourage or deter real investment, or by both. We shall see in Section III.B that the behavior of the international value of the U.S. dollar is rather similar to that of the after-tax real rate and may reflect similar factors.

### **III.B. The U.S. Real Exchange Rate and Trade Deficit**

The real exchange rate is the product of the nominal exchange rate (domestic currency/foreign currency) and the ratio of the foreign to domestic price level. It measures the amount of domestic goods it takes to buy a standard basket of foreign goods; so a decline in the real exchange rate means a real appreciation of the domestic currency. An enormous amount has been

written concerning the appreciation of the trade-weighted U.S. real exchange rate by some 40 to 50 percent between summer 1980 and winter 1985 and the sharp depreciation since February 1985.

It is generally forgotten, however, that the U.S. real exchange rate depreciated by about 30 to 40 percent during and especially immediately following the breakdown of the Bretton Woods System in 1971-1973. Lothian (1985) has demonstrated that the behavior of the U.S. real exchange rate is best described as stable under the Bretton Woods system, shifting up (depreciating) by about 30% in 1973, relatively stable again through 1980, shifting back down by about 30% in 1980-1982 and relatively stable since then except for the 1984-85 bubble.<sup>46</sup> Figure 2 illustrates the behavior of the value of the dollar since the last days of the Bretton Woods System. This behavior is broadly similar to that of the after-tax real interest rate -- particularly so if the Smithsonian Agreement and massive interventions under it are viewed as delaying the dollar depreciation from 1971 to 1973. It certainly seems reasonable to hypothesize that the shifts in the U.S. real exchange rate are explained either by the U.S. real interest rate or by the factors causing shifts in that rate.

One body of literature associates appreciation of the real exchange rate with the temporary increase in the real interest rate which is induced by an unexpected reduction in the growth rate of the nominal money supply.<sup>47</sup> These theories imply subsequent depreciations as the domestic real interest rate falls back to normal levels. Therefore they would seem to be of little value as explanations of persistent shifts in the levels of both real interest rates and real exchange rates.<sup>48</sup>

A more promising model can be based on the fact that the difference between total national investment and saving is financed by and equal in



amount to net capital inflows. On this view the 1971-1980 decline in U.S. after-tax real interest rates reflects a downward shift in the perceived desirability of investment in the United States relative to the rest of the world in general. This would move desired U.S. net capital outflows up relative to 1960-1970 or the period since 1980.<sup>49</sup> But net capital outflows are equal in magnitude to the current account through the iron laws of double entry bookkeeping. The only way to finance capital outflows is to increase our exports and net foreign earnings relative to our imports.

The real return on international investments is not affected by the level of the exchange rate so long as that level is expected to persist. However, the current account is very much affected by the level of the real exchange rate -- a depreciation increases the current account surplus as would be required to finance increased net capital outflows. When America again became an attractive place to invest, these net capital outflows dropped to become large net capital inflows and the dollar appreciated to induce the corresponding current account deficit. Indeed, since many foreign investors are de facto tax exempt on U.S. interest, the tax-exempt real interest rate may be more appropriate to understanding international capital flows, and this tax-exempt rate has been much higher in the 1980s as compared to the 1960s.

So we see that there is an explanation of the relationship among U.S. real interest rates, the value of the U.S. dollar, capital flows, and the current account that is consistent with the facts. Furthermore, this explanation does not lead to predictions of an imminent collapse of the dollar as suggested by comparisons of the dollar's purchasing power now with that in 1973-1980 while ignoring the period before 1973.

The 1984-1985 behavior of the real exchange rate is consistent with too many explanations to provide much guidance as to the broader issues. These

explanations include: (1) the entire episode was a rare speculative bubble, perhaps pricked by inspired central bank intervention. (2) The real exchange rate was at the right level in winter 1985, but subsequently depreciated due to a major acceleration in U.S. money growth relative to the money growth of America's major trading partners or due to the Administration's proposals to shift the tax burden from individuals to business. (3) The U.S. dollar was more valuable in winter 1985 than under Bretton Woods because of the Darby effect's raising tax-exempt real yields, particularly on long-term bonds; as fears of future inflation abated the tax-exempt real yield dropped sharply in 1985 reducing the relative attractiveness of U.S. securities to foreign and other tax-exempt investors.<sup>50</sup> (4) U.S. trading partners have embarked on less stimulative policies in 1985 in response to the dollar's appreciation under their previous policies.

### **III.C. Internationalization of Banking and Finance and the Linkage of World Capital Markets.**

The move from fixed to floating exchange rates was expected to permit a greater range of freedom for central banks to pursue independent monetary policies with greater differences among real interest rates.<sup>51</sup>

Future research may well demonstrate that the widely noted influence of U.S. real interest rates on foreign rates in fact increased due to reductions of capital controls and increased internationalization of banking and finance subsequent to the breakdown of the Bretton Woods system. For now, the research is scanty but nonetheless suggestive.

Marston (1976), Cosandier and Lang (1981), and Fratianni and Wakeman (1982) have shown that Eurocurrency markets are efficient in the sense of the absence of arbitrage profits based on deviations from interest rate parity. The integration of the Eurocurrency market does not necessarily imply

integration of even the national capital markets for which active Eurocurrency trading exist. Dooley and Isard (1980) point to large differences between domestic German rates and Euromark rates (up to 2 percent per annum in 1973) and explain them by variations in political risks, particularly with respect to capital control changes.

Hartman (1984) found evidence of two-way causality between domestic U.S. interest rates and Eurodollar rates during 1975-1978 which suggested more integrated capital markets under floating rates. However, Genberg, Saidi, and Swoboda (1982) find little connection between American and foreign interest rates movements: U.S. and U.K. rate movements did not seem to be influenced by any foreign rate movements while Canadian and (for some periods) German interest rates were influenced by the U.S. interest rate but only by a small amount relative to Canadian and German events, respectively. Solnik (1982) also reports that domestic factors dominate the determination of interest rates in eight major developed countries over 1971-1980. Examining the interest rate effects of U.S. money stock announcements, Husted and Kitchen (1985) find that the bulk of the U.S. interest-rate change is reflected in the Canadian interest rate but for Germany nearly all of the effect is on the forward premium which seems consistent with much weaker links between the U.S. and Germany than between the U.S. and Canada. These studies are primarily concerned with nominal interest rates so the results may primarily reflect the relative importance of movements in domestic and common international determinants of expected inflation during the periods considered.

A few studies have attempted to examine the extent to which real interest rates are equalized internationally. Cumby and Obstfeld (1984) and Mishkin (1984) report strong evidence that tax-exempt real rates were not equalized across countries during 1976-1981 or 1967-1979, respectively. Using data for

1973-1982, Mark (1985) demonstrates that neither are after-tax real rates equalized.<sup>52</sup> While real rates may not be equalized internationally, capital flows induced by real rate differentials can imply cross-country linkages. Cumby and Mishkin (1986) show that real rate movements among the U.S. and seven other industrialized countries are significantly linked even though the linkages are significantly less than complete. That is, an increase in the U.S. real rate would tend to increase real rates abroad by a lesser amount as capital is drawn to the United States. Edwards and Khan (1985) propose an empirical measure of the extent to which domestic interest rates are linked to foreign rates.

The incomplete linkage of real interest rates internationally appears to reflect risk premia which vary with the size of a nation's foreign borrowing. It is not clear whether this reflects primarily changing prices of systematic risk as the world portfolio is changed or varying perceptions of political risk which acts like a default risk.<sup>53</sup> Obstfeld (1985) reports evidence which is consistent with increasingly integrated capital markets in recent years, but corroborating evidence on this issue is sadly lacking.

#### **IV. Conclusions**

This paper has examined three intertwined questions: the internationalization of American banking and finance, cross-country risk associated with general increases in real interest rates, and the forces shaping the U.S. real interest rate and its influence on the foreign real interest rates. The internationalization of private banking and finance has substantially substituted for governmental linkages of capital markets which existed under the Bretton Woods system. Indeed, the process of internationalization has been fostered by the reduced need for capital controls with central banks largely out of the exchange rate intervention business.<sup>54</sup>

The return of the U.S. domestic after-tax real interest rates to normal or slightly higher levels since 1981 has raised real interest rates throughout the world. This has greatly increased the real debt service of a number of countries with disastrous, nondiversifiable consequences for international banks. While the adjustment period is more stressful than the final equilibrium when (reduced) capital inflows resume, the only hope for suffering countries of a substantial fall in after-tax U.S. real interest rates would be that the Federal Reserve System's recent policies reignite inflation and return the U.S. to a situation more like the 1970s. Tax-exempt real rates, however, may be more relevant internationally, and they have declined recently as expected inflation has waned.

A more positive viewpoint is that the low real interest rates and value of the U.S. dollar in the 1970s reflected profound problems in the United States. Over the longer run, a healthy America is vital to the health of the world and a return to higher real interest rates might be a price worth paying.

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Notes

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<sup>1</sup>See Lees (1982, pp. 196-7) for a discussion of this longer term perspective. Although the trade-financing aspect of international banking became increasingly important after 1945, the main expansion of international banking occurred subsequent to 1960. Theobald (1981) argues that the branches Citibank had established primarily to finance trade with Europe put it in a position to enjoy a major share of the Eurodollar market when it developed in the 1960's.

<sup>2</sup>Schwartz (1983, pp. 18-19) succinctly summarizes conditions under the European Payments Union which was dissolved December 24, 1958, and replaced by general convertibility of European currencies into U.S. dollars at least for current account purposes. She notes that "[i]t was not until 1961, however, that restrictions against U.S. exports were removed."

<sup>3</sup>See Sachs (1984) for a review and extension of the literature on the advantages of bank lending over securities sales.

<sup>4</sup>See Wilson (1985) for one example.

<sup>5</sup>Daily volume of Federal Funds lending averaged less than \$2 billion in 1960 (Willis, 1964, p. 29). Currently, Federal Funds and such cousins as interbank repurchase agreements average well over \$100 billion per day. Local banking markets still exist today: Keeley and Zimmerman (1985) report recent spreads of 2 percent or more in the state mean interest rates paid on large



consumer checking and savings accounts (Super NOW and MMDA, respectively) over seven states in the twelfth Federal Reserve District.

<sup>6</sup>Correspondent relationships and representative offices also should be mentioned. The former arrangements are used where the volume of business is insufficient to justify a direct presence. Representative offices are an intermediate step prior to establishment of a foreign branch or subsidiary or an alternative to such a branch or subsidiary where foreign banks are denied entry into the market for banking services.

<sup>7</sup>See Goldberg and Saunders (1980), Lees (1982, p. 19.8), Theobald (1981), and U.S. Board of Governors of the Federal Reserve System (1974, pp. 105-106).

<sup>8</sup>See Key (1982), Terrell and Mills (1983), and Melvin (1985, pp. 177-178).

<sup>9</sup>See Giddy (1985), Bartlett and Templeman (1985), and Mills (1985). I am indebted to James Houpt for points (1) and (2). Sketchy data provided by Elaine Peterson of the Board of Governors suggests that (unlike foreign subsidiaries in the U.S. -- see Section II.B) growth similarly slowed in total assets of foreign subsidiaries of U.S. banks, bank holding companies, and Edge Act corporations; so change in organizational form is not a factor.

<sup>10</sup>Porzecanski (1981, p. 10) reports that international earnings were half of total earnings for the ten largest U.S. banks as early as 1975. (The fraction would have been substantially higher than half if the four California and Chicago banks were excluded.)

<sup>11</sup>Key and Brundy (1979).

<sup>12</sup>Key and Brundy (1979, p. 786). It should be noted that some members of Congress -- including especially Senator Jake Garn, Chairman of the Senate Banking Committee -- have proposed modifying the national treatment approach by having the U.S. Comptroller of the Currency "take into account" the treat-

ment of U.S. banks in a foreign applicant's home country. See Holden (1984).

<sup>13</sup>See Terrell and Key (1977, p. 56).

<sup>14</sup>The \$18.7 billion in total assets of subsidiary commercial banks at the end of 1977 [calculated from Goldberg and Saunders (1981, p. 18)] are completely accounted for by 15 foreign-owned institutions in Table 9-4 of Kaufman (1980, p. 146). An idea of the rate of foreign entry into the U.S. can be gained by noting that 26% of assets were due to the 4 banks started or acquired between 1923 and 1955, 19% due to the 3 banks controlled since 1964-1966, 30% by the 4 banks controlled since 1968-1972, and, the remaining 25% due to 4 banks controlled since 1974-1975. Three then pending acquisitions (subsequently approved) would have added another \$20.6 billion in total assets.

<sup>15</sup>A foreign observer should note that data on the number of U.S. banks is inflated by a factor of perhaps 6 or 7 due to various state regulations restricting branching. As a result, many separate banks may be owned by the same holding company rather than having a single bank with many branches.

<sup>16</sup>Goldberg and Saunders also found the DM/\$ exchange rate to be a statistically significant factor over 1972-1979. When an exchange-rate index was substituted, this finding disappeared. I believe that the relationship for the DM/\$ exchange rate reflects coincidental trends in this rate and growth in foreign banks in the U.S. over this period. Accordingly, little weight should be put on that theoretically surprising finding.

<sup>17</sup>See Ball and Tschoegl (1982) and Walker (1983).

<sup>18</sup>The F.D.I.C. has effectively guaranteed all deposits in large banks (regardless of the \$100,000 legal limit) since the Continental-Illinois affair; critics view this as subsidizing various risky practices including American banks' borrowing and lending abroad. A related policy concern is

that overseas deposits of U.S. banks are exempt from deposit insurance premiums even though the F.D.I.C. effectively insures them; Federal Reserve Board Chairman Paul A. Volcker proposed to Congress imposing such premiums on September 11, 1985 (see Langley and Wynter 1985).

<sup>19</sup>In efficient markets, a rise or fall in interest rates may be anticipated and reflected in the term structure of interest rates and futures market prices. Accordingly, the statements should be interpreted as a rise or fall relative to previously anticipated levels of interest rates. In the United States, interest rate risk in this simple form is primarily a problem for thrift institutions rather than banks.

<sup>20</sup>That is, the modern theory of finance says that in an efficient financial market, the price of \$100 tomorrow for sure will be exactly the same as the price of \$200 tomorrow which is payable only if a fair coin turns out to be heads.

<sup>21</sup>Of course, some Texas banks, for example, still have disproportionate loans to oil-price sensitive firms with recent disastrous results.

<sup>22</sup>Chen, Roll, and Ross (1985) have empirically tested the APM with data drawn from U.S. securities markets. They found no evidence of priced risk associated with either the dollar exchange rate or the price of oil. These factors are nonetheless included in the list as being potentially more important for foreign than for American securities. Chen, Roll, and Ross identified another set of five factors as affecting expected returns in their data set: innovations in industrial production, in the BAA-AAA bond yield spread, in the long- versus short-term governments yield, and in inflation, as well as their measure of the change in the expected inflation rate which can also be interpreted as the ex-post real interest rate. The first three factors I am lumping together as the business cycle, and the last two factors

are represented by my items 2 and 3.

<sup>23</sup>See Darby, Lothian, et al. (1983).

<sup>24</sup>The problems in foreign loans associated with the higher real interest rates of the 1980s are well known. Schoder and Vankudre (1984) found that the Mexican debt crisis of 1982 depressed returns to bank stocks generally because country-by-country loan-exposure disclosures was not required until 1983. However, Cornell and Shapiro (1984) find that adverse effects on bank stock returns in both 1982 and 1983 were related to the degree of exposure to Latin American events. The difference between the two studies seems to be that the latter allowed for gradual leakage of information -- about both events and bank portfolios -- whereas the former study concentrated on a few public announcement dates.

Porzekanski (1981, p. 10), in contrast, reminds us that foreign loan losses were extremely low in the 1970s when real interest rates were very low. (The causes of movements in real interest rates are discussed in Section III below.) Ozler (1985) reports that reschedulings prior to 1981 were beneficial to the lending banks because of the resulting fees and increases in spread over LIBOR, but this was reversed after 1980 when sharp increases in real interest rates increased the credibility of LDC threats to repudiate.

<sup>25</sup>The formula for maintaining constant real (dollar-denominated) interest payments as a fraction of income is

$$b = \dot{y} - r - \dot{r} - \dot{e}$$

where  $b$  is gross real borrowing minus real interest payments as a fraction of debt (all in constant U.S. dollars),  $r$  is the U.S. real interest rate, and  $\dot{y}$ ,  $\dot{r}$ ,  $\dot{e}$  are the growth rates of real income,  $r$ , and the real exchange rate, respectively. This formula holds exactly only for continuously compounded growth rates (logarithmic changes). In steady-state equilibrium,

$\dot{r}$  and  $\dot{e}$  are both 0 and there will be a net inflow of resources ( $b > 0$ ) so long as  $\dot{y} > r$ . Note that the transitional effects of a movement in  $r$  can be huge. For example, suppose a country was growing at 8% and paying a real interest rate of 2%; in initial equilibrium it could finance an amount of investment equal to 6% of its outstanding debt each year without ever increasing its debt burden relative to GNP. Now suppose that the real interest rate rises to 4%. To maintain literally a constant interest burden, the country would have to repay a literally incredible 47 1/2% of its foreign debt. More likely results would be allowing the interest burden to rise, rescheduling, or repudiation. Note, however, that even if the country lets the target interest burden double with the real interest rate, (so that debt/GNP is constant) the net inflow of resources falls by a third from 6% to 4% of the foreign debt. Edwards (1984) finds that the real interest rate paid by LDCs in fact increases with debt/GNP, but given his period of measurement this could be a proxy for real interest payments divided by GNP. If  $r$  rises with the latter variable, the constant debt/GNP policy might be infeasible.

<sup>26</sup>Grossman and Van Huyck (1985) argue that reschedulings associated with identifiably bad states of the world are "excusable" and so do not cost the government much reputation in the world capital markets. This may provide an alternative or complementary explanation for Ozler's (1985) empirical result that countries which rescheduled before 1981 typically improved the returns to their lenders while the lenders were made worse off in the post-1980 era (of excusable defaults due to high real interest rates and the high U.S. dollar?).

<sup>27</sup>Classic references are to Karaken and Wallace (1978), Edwards and Scott (1979), and Dotham and Williams (1980). This analysis assumes that bankers are maximizing stockholder's expected value and are not concerned about loss of their (nondiversified) firm-specific human capital.

<sup>28</sup>Barth et al. (1985) have demonstrated the importance of this in the risk-taking of U.S. thrift institutions with negligible or negative market-equity values.

<sup>29</sup>Horvitz (1980) relates bank examination not so much to preventing bank failure but limiting the size of losses to the F.D.I.C. by early detection. Other than for poor control over operating expenses, this makes sense only in preventing the management from taking undue risks: if the market-equity value is negative nothing is gained for the F.D.I.C. if the bank is closed before this is reflected on the accounting books of the bank.

<sup>30</sup>Indeed, bankers might note that government officials in the 1970s encouraged this as a private substitute for foreign aid. Bank examiners have been increasingly concerned with country risk since 1977. A partially operative standard supervision policy was strengthened and made universal under the International Lending Supervision Act passed in late 1983. The correlation of country risk across countries does not seem to be much recognized by examiners, however, since "[b]anks with large concentrations of loans in particular countries are expected to maintain higher capital ratios than well-diversified banks." (Young, 1985, p. 37). In future research, I plan to examine LDC bond returns for evidence on these issues; Edwards (1985) finds that bond returns provide useful data on perceived risk for these countries.

<sup>31</sup>If output did not rise, the fall in private investment would approximately equal the increase in government spending. If output is increased — as appears to be the case in the short run — investment falls less or even rises.

<sup>32</sup>See, for example, Plosser (1982) and Evans (1985a,b).

<sup>33</sup>Further adjustment of this consolidated structural deficit for the inflationary component of state and local interest and cyclical reduction in

the state and local surplus could easily change this small remaining deficit to a small surplus. Furthermore, Eisner and Pieper (1985) observe that government spending for net capital formation generally substantially exceeds \$200 billion; on their balance-sheet view this factor alone turns the entire federal deficit into a surplus.

<sup>34</sup>The correction in Table 4 represents the product of a 3.8 percent inflation rate for 1985 and a \$1300 billion average private-investor holdings of federal debt. These numbers are approximate and it is the order of magnitude rather than a precise estimate which is intended. Further discussion of the inflation adjustment can be found in Siegel (1979), Jump (1980), Cagan (1981), Horrigan and Protopapadakis (1982), and Darby and Lothian (1983).

<sup>35</sup>Darby, Haltiwanger, and Plant (1985) indicate a normal unemployment rate a bit under 6 percent for 1985. The average unemployment rate for the year is estimated at 7.2 percent. The rule of thumb among budget analysts is that a \$40 billion increase in the federal budget deficit with each 1 percentage point increase in the unemployment rate.  $(\$40 \text{ billion} / \%) \times (7.2\% - 6.0\%) = \$48 \text{ billion}$ . There are numerous other ways to estimate the cyclical component of the deficit and a number of \$10 to \$20 billion higher could be justified. Again the aim here is to provide a conservative guide to the order of magnitude which is involved.

<sup>36</sup>Using a related approach Barro (1984, 1985) found that the 1982-84 federal deficits were in line with U.S. experience since 1920 given the unemployment rate, inflation rate, and unusually high real interest rates.

<sup>37</sup>The alert reader might note that perhaps Reagan's shift to defense spending from other goods and services and welfare payments has increased government spending and so increased real interest rates in that way. Although federal spending for goods and services edged up from 7.49% of GNP in

1980 to 8.07% in 1984, offsetting movements in state and local spending were such that total government spending fell ever so slightly from 20.44% to 20.43% of GNP over the same years.

<sup>38</sup>References to the ultrarationality literature include Barro (1974, 1978), Kochin (1974), David and Scadding (1974), Darby (1979), Seater (1982), Kormendi (1983), Seater and Mariano (1985).

<sup>39</sup>Figure 1 is an updated version of a figure appearing in Holland (1984). Two changes from Holland are (1) the use of the term "tax-exempt rate" for his (I believe misleading) term "before-tax rate" and (2) the use of market estimates of the marginal tax rate.

<sup>40</sup>Only two quarters per year were plotted due to availability of (the Livingston) data on inflation expectations. Similar movements in real rates were observed for 6-month Treasury bills and 10-year government bonds.

<sup>41</sup>The marginal tax rate is estimated as 1 minus the ratio of AAA municipal bond yields to AAA corporate bond yields (quarterly average of monthly Citibase data; see Ayanian 1983). A somewhat higher tax rate would be estimated if continuous 1-year bill data were available and used.

<sup>42</sup>See Darby (1975) and especially End of Chapter Essay 4 in Darby and Melvin (1986).

<sup>43</sup>The marginal tax rate implicit in the bond market was used here to obtain a continuous series. Implicit tax rates in the bill market are believed to be higher than in the bond market because of the dominance of corporate tax payers in the bill market. An underestimate of the tax-rate overestimates the after-tax rate by an amount which increases with the level of nominal interest rates. Holland (1984) examines monetary policy, the state of the economy, business taxes, federal budget deficits, and declining relative price of energy as possible explanations of the upward shift in real



rates, but finds them all lacking -- generally because they change too late to explain the shift which occurred in late 1980 and early 1981.

<sup>44</sup>See Beranek, Humphrey, and Timberlake (1985).

<sup>45</sup>See Krasker (1980).

<sup>46</sup>It may be premature, of course, to term the 1984-1985 experience a bubble. An alternative characterization of the post-1980 experience is that the dollar appreciated from summer 1980 to winter 1985 except for a two-year pause in 1982-1984 and then reversed trend in 1985. As will be noted below, the experience since February 1985 is not yet sufficient to be informative as to the value of alternative explanations.

<sup>47</sup>Classic references are to Dornbusch (1976) and Frankel (1979).

<sup>48</sup>Meese and Rogoff (1983a, 1983b) have confirmed the weak empirical value of these theories as an explanation for recent movements in the real exchange rate.

<sup>49</sup>Obviously, when we are concerned with movements in the real value of the dollar generally, the timing is dominated by the U.S. events which would affect all bilateral exchange rates. If we were particularly concerned with the British pound or French franc, for example, our discussion would obviously require adjustment for the events surrounding the elections of Thatcher and Mitterand, respectively.

<sup>50</sup>As U.S. real interest rates dropped in 1985, so did projections of future deficits. So even the deficit story is roughly consistent with the 1985 depreciation.

<sup>51</sup>Darby (1985), summarizing research in Darby, Lothian, et al. (1983) and elsewhere, argues that central banks in fact exercised a substantial amount of independence in monetary policy under the Bretton Woods system of adjustable (not fixed) exchange rates and capital and trade controls.

<sup>52</sup>The role of taxes in determining interest rates in a world with differential taxes and capital flows is a complicated question. Lee and Zechner (1984) make an important pioneering contribution to our understanding of the issues involved.

<sup>53</sup>The analysis in Darby, Lothian, et al. (1983) emphasized systematic risks. Subsequent events and reflection on the "peso problem" (see Krasker 1980) has led me to consider movements in measured risk premiums (differences between real rates) as perhaps dominated by movements in a generally small probability of constructive default in the form of capital controls or other sovereign acts.

<sup>54</sup>Loopesko (1984) provides evidence that central banks have indeed continued to intervene under floating exchange rates, that this intervention did affect exchange rates in the short run, but that the size of the effect was small relative to the magnitude of intervention. Results like these -- and the leading role of the U.S. Treasury -- may have reduced the level of intervention in recent years until the announcement on September 22, 1985, of a program of joint intervention by American, Britain, France, Germany, and Japan.

Table 1  
Indicators of Foreign Involvement of U.S. Banks

	Year					
	1960	1965	1970	1975	1980	1984
1. Number of U.S. Banks Operating Foreign Branches	8	13	79	126	159	163
2. Number of Foreign Branches of U.S. Banks	124	211	532	762	799	905
3. Total Assets of Foreign Branches of U.S. Banks (\$ Billions)	n.a.	8.9	46.5	176.5	397.5	452.2
4. Total Assets of All U.S. Banks (\$ Billions)	257.6	377.3	576.2	965.2	1703.7	2262.6
5. Ratio of Row 3 to Row 4	n.a.	2.4%	8.1%	18.3%	23.3%	20.0%
6. Claims of U.S. Banks on Foreigners (\$ Billions)	4.5	9.8	11.8	54.7	176.9	409.5
7. Claims of U.S. Banks on Foreign Banks (\$ Billions)	1.4	3.1	5.1	33.8	119.6	291.2
8. Claims of U.S. Banks on Foreign Nonbanks (\$ Billions)	3.1	6.7	6.7	20.9	57.3	118.3
9. Claims of Foreigners on U.S. Banks (\$ Billions)	9.7	17.3	31.3	62.7	151.4	338.5

Note: Data are not strictly comparable over time.

Sources: Rows 1-3, 1960-1975, Fieleke (1977, p.10).

Rows 1-2, 1980, 67th Annual Report of the Board of Governors of the Federal Reserve System, 1980.

Rows 1-2, 1984, 71st Annual Report of the Board of Governors of the Federal Reserve System, 1984.

(Table 1 concluded)

Row 3, 1980, Federal Reserve Bulletin, September 1981, p. A56.

Row 3, 1984, Federal Reserve Bulletin, September 1985, p. A55.

Row 4, 1960-1970, Banking and Monetary Statistics, 1941-1970,  
pp. 29-31.

Row 4, 1975, Federal Reserve Bulletin, June 1976, p. A16.

Row 4, 1980, Federal Reserve Bulletin, June 1981, p. A17.

Row 4, 1984, Federal Reserve Bulletin, September 1985, p. A18.

Rows 6-9, 1960-1984, International Financial Statistics (March  
1985 tape and May 1985 issue) of the I.M.F., lines 7a.d,  
7a.d minus 7add, 7add, and 7b.d, respectively.

Table 2

## Total Assests of Foreign Banks and Subsidiaries in the U.S.

(Amounts in \$ Billions)

	Branches & Agencies <sup>a</sup>	Subsidiary Commercial Banks	Total Assets	
			Amount	% of U.S. Total
1966	n.a.	n.a.	6.5	1.6%
1972	22.2	4.6	26.8	3.6%
1975	50.9	13.4	64.3	6.7%
1978	106.3	23.2	129.5	10.2%
1980	147.9	50.2	198.1	11.6%
1984	272.8	105.6	378.3	16.7%

Notes: Data are not strictly comparable over time.

<sup>a</sup>Branches and agencies include New York Investment Companies, Banking Edge Act Corporations, and Agreement Corporations.

Sources: 1966: "Proposed Legislation Re Foreign Banks, "Federal Reserve Bulletin, December 1974, 60: 881.

1972-1978: Computer printouts supplied in 1980 to Lawrence G.

Goldberg by the International Banking Section, Board of Governors of the Federal Reserve System (see Goldberg and Saunders, 1981).

1980-1984: Computer printouts supplied in 1985 to the author by the Financial Structure Section, Board of Governors of the Federal Reserve System.

Table 3

Number of Foreign Controlled U.S. Banking Offices

<u>Year</u>	<u>Data</u>			
	<u>Branches &amp; Agencies<sup>a</sup></u>	<u>Subsidiary U.S. Banks</u>	<u>Total</u>	<u>As Percent of All U.S. Banks<sup>b</sup></u>
1972	87	26	113	0.8
1975	153	33	186	1.3
1978	276	40	316	2.1
1980	345	44	389	2.6
1984	530	66	596	3.9

Notes: Data are not strictly comparable over time.

<sup>a</sup>Branches and agencies include New York Investment Companies, Banking Edge Act Corporations, and Agreement Corporations.

<sup>b</sup>Denominator is number of U.S. chartered commercial banks plus foreign branches and agencies.

Sources: Computer printouts supplied in 1985 to the author by the Financial Structure Section, Board of Governors of the Federal Reserve System.

Table 4

## Adjustment of U.S. Federal Deficit, 1985

(Amounts in \$ Billions)

Estimated federal deficit (NIPA basis)	197
Less, Inflation component of federal interest payments	<u>49</u>
Inflation-adjusted federal deficit	148
Less, Cyclical component of federal deficit	<u>48</u>
Inflation-adjusted structural federal deficit	100
Less, State and local surplus (NIPA basis)	<u>58</u>
Adjusted government deficit	42

Source: U.S. Department of Commerce and computations by the author as described in text.

Table 5

## Interest Concepts in Figure 1

Nominal rate =  $i$  = market yield on one-year Treasury bill

Tax-exempt real rate =  $r = i - \hat{p}$

After-tax real rate =  $r^* = i - \hat{p} - ti$

$$= i - \hat{p} - t \left( \frac{r^*}{1-t} \right) - \frac{t}{1-t} \hat{p}$$

Expected inflation over year =  $\hat{p}$

Marginal tax rate =  $t$

Note:  $i - r = \hat{p}$

$$r - r^* = ti = t \left( \frac{r^*}{1-t} \right) + \frac{t}{1-t} \hat{p}$$

$$i = r^* + \frac{t}{1-t} r^* + \hat{p} + \frac{t}{1-t} \hat{p}$$

Sources:  $i$  adjusted to yield basis from discount rate data from Federal Reserve Bank of St. Louis and Citibase.

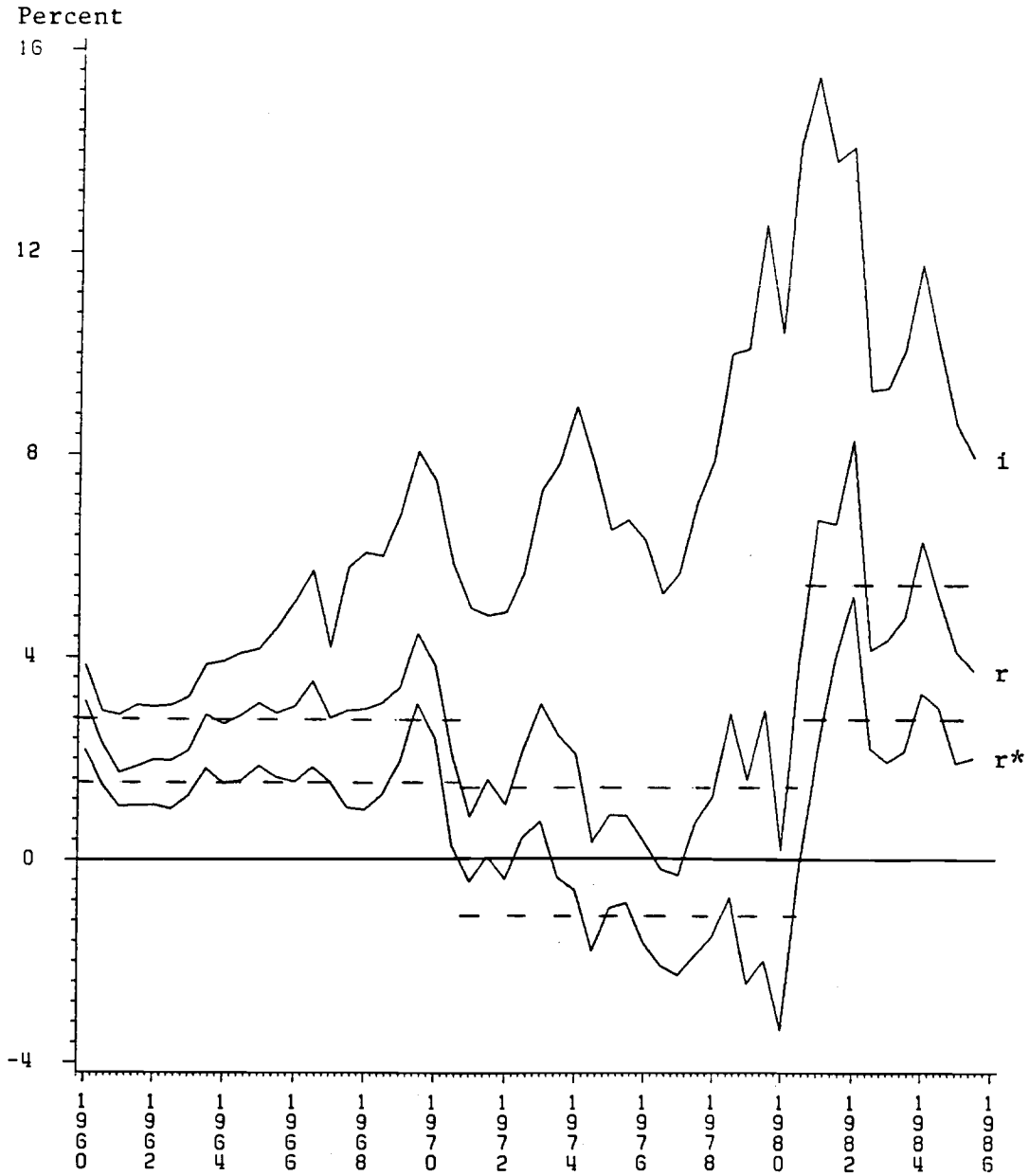
$\hat{p}$  estimated inflation rate using Livingston data and John Carlson's formula from Federal Reserve Bank of St. Louis.

$t$  estimated as  $1 - (i_{\text{mun}}/i_{\text{corp}})$  where  $i_{\text{mun}}$  and  $i_{\text{corp}}$  are data on AAA rated municipal and corporate bonds, respectively, from Citibase.



Figure 1

Nominal and Real One-Year U.S. Interest Rates  
1960-1985



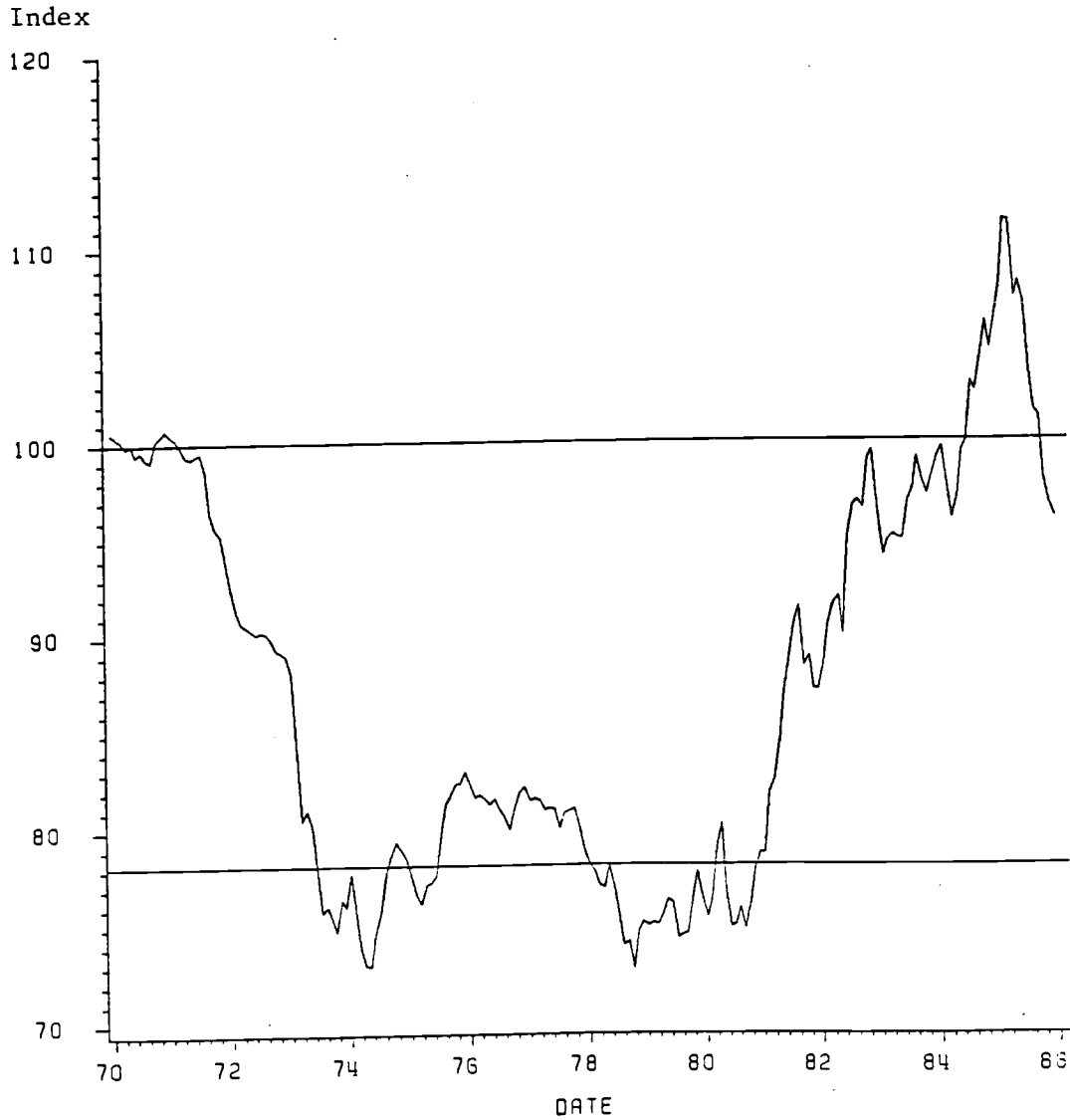
Legend: i nominal rate  
r tax-exempt real rate  
r\* after-tax real rate

Sources: See Table 5.

Figure 2

## Trade-Weighted Real Value of the Dollar

(Inverse of the Trade-Weighted U.S. Real Exchange Rate)  
1970 - 1985



Source: Morgan Guaranty Trust Company of New York, World Financial Markets (base 1980-82 data rebased by author to 1970 = 100)