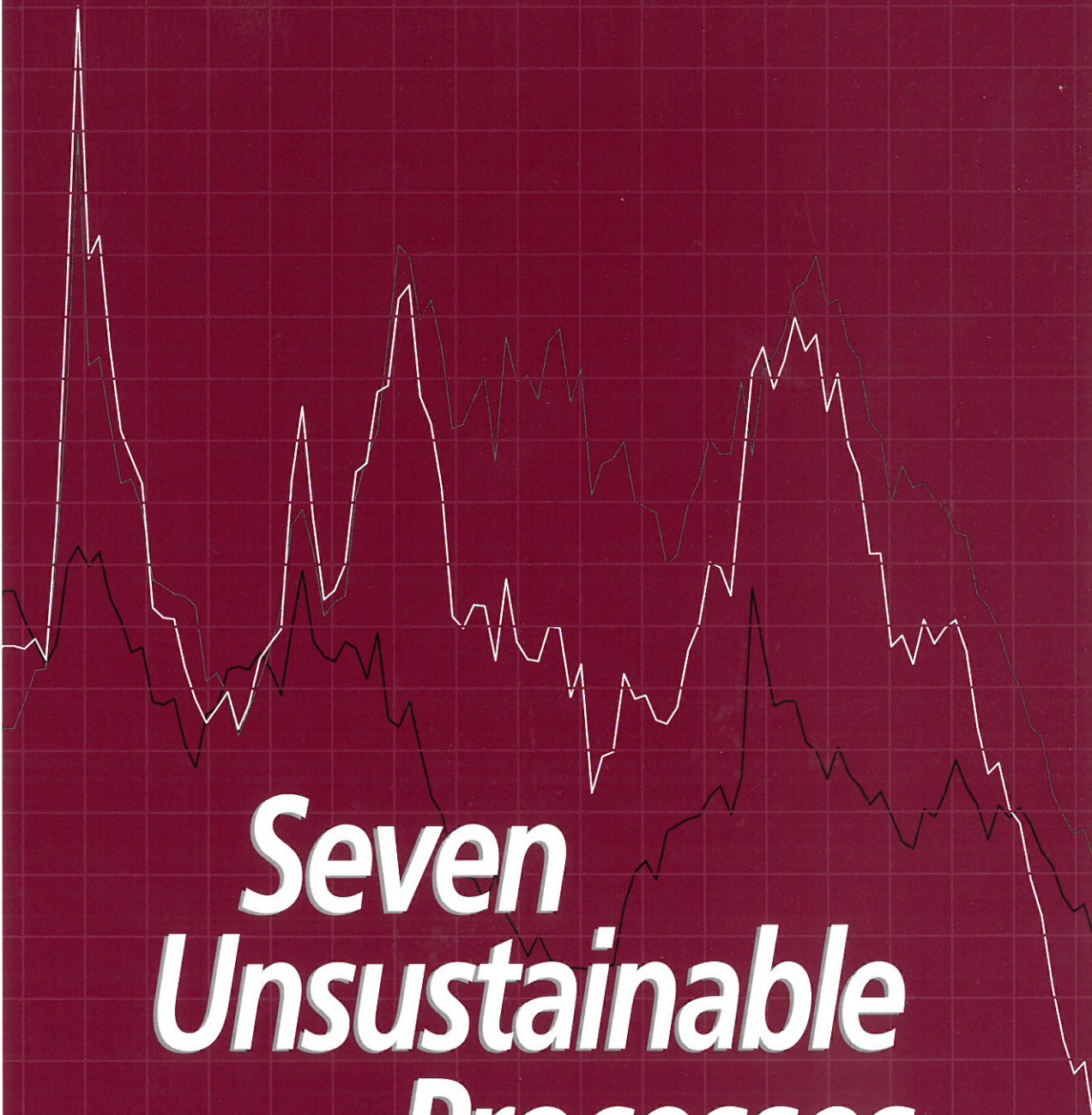




SPECIAL REPORT

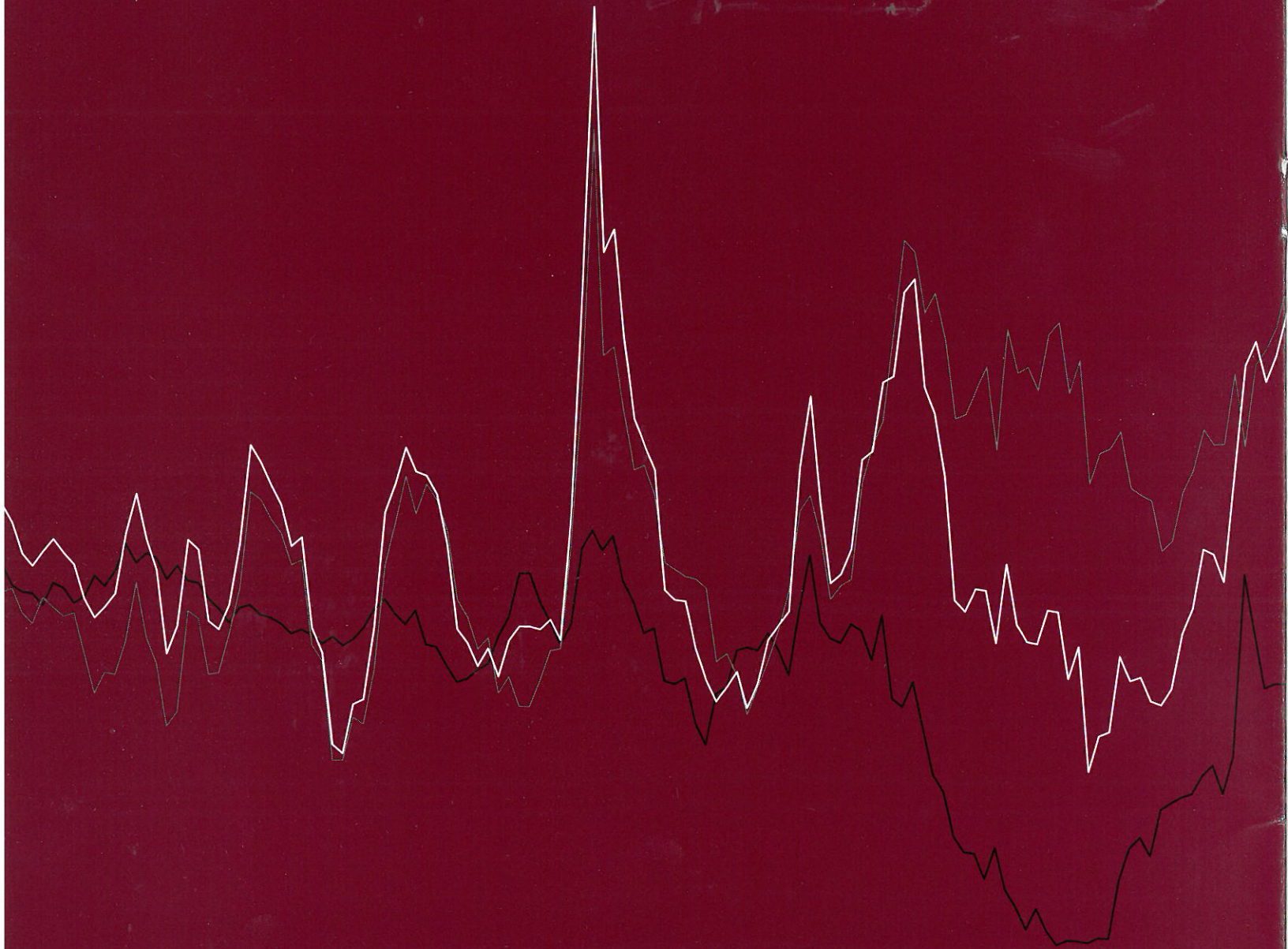
LEVY INSTITUTE



Seven Unsustainable Processes

*Medium-Term Prospects and Policies
for the United States and the World*

Wynne Godley



The Jerome Levy Economics Institute is publishing this proposal with the conviction that it represents a constructive and positive contribution to the discussions and debates on the relevant policy issues. Neither the Institute's Board of Governors nor its Board of Advisors necessarily endorses the proposal.

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The U.S. economy has now been expanding for nearly eight years, the budget is in surplus, and inflation and unemployment have both fallen substantially. In February the Council of Economic Advisers (1999) forecast that GDP could grow by 2.0 to 2.4 percent between now and the year 2005, and this forecast has since been revised upwards (Office of Management and Budget 1999). Many people share the CEA's optimistic views. For instance, in his New Year message (*Financial Times*, December 29, 1998) Alan Blinder compared the United States's economy to one of its mighty rivers—it would “just keep rolling along”; and President Bill Clinton concluded his *Economic Report of the President* with the words “There are no limits to the world we can create, together, in the century to come.” This paper takes issue with these optimistic views, although it recognizes that the U.S. economy may well enjoy another good year or two.

During the last seven years a persistently restrictive fiscal policy has coincided with sluggish net export demand, so rapid growth could come about only as a result of a spectacular rise in private expenditure *relative to income*. This rise has driven the private sector into financial deficit on an unprecedented scale. The Congressional Budget Office (CBO) is projecting a rise in the budget surplus through the next 10 years, conditional on growth's continuing at a rate fast enough to keep unemployment roughly constant, and this implies that it is government policy to tighten its restrictive fiscal stance even further (Congressional Budget Office 1999a,

The fiscal projections in this paper were based on the CBO report published in April. The CBO published a revised outlook in July, but it is highly unlikely that its new projections will change any of this paper's conclusions qualitatively. Indeed, the strategic problems, to be identified in this paper, may turn out to be more severe because the CBO's projections both of growth in the economy and of the budget surplus have been raised.

1999c). At the same time, the prospects for net export demand remain unfavorable. But these negative forces cannot forever be more than offset by increasingly extravagant private spending, creating an ever-rising excess of expenditure over income.

If spending were to stop rising relative to income without there being either a fiscal relaxation or a sharp recovery in net exports, the impetus that has driven the expansion so far would evaporate and output would not grow fast enough to stop unemployment from rising. If, as seems likely, private expenditure at some stage reverts to its normal relationship with income, there will be, given present fiscal plans, a severe and unusually protracted recession with a large rise in unemployment.

It should be added that, because its momentum has become so dependent on rising private borrowing, the real economy of the United States is at the mercy of the stock market to an unusual extent. A crash would probably have a much larger effect on output and employment now than in the past.

A long period of stagnation in the United States, still more recession, would have grave implications for the rest of the world, which seems to be depending, rather irresponsibly, on the United States to go on acting as spender of last resort indefinitely.

This paper makes no short-term forecast. Bubbles and booms often continue much longer than anyone can believe possible and there could well be a further year or more of robust expansion. The perspective taken here is strategic in the sense that it is only concerned with developments over the next 5 to 15 years as a whole. Any recommendations regarding policy do not have the character of “fine-tuning” in response to short-term disturbances. They ask, rather, whether the present stance of either fiscal or trade policy is structurally appropriate looking to the medium- and long-term future.

A sustained period of stagnation or recession, through its adverse effect on the national income, could drive the budget back into deficit without there being any relaxation of policy, yet to counteract an endemic recession, it will be necessary to relax fiscal policy, making any emerging deficit even larger. Further relaxation of monetary policy could not sustain the expansion, except temporarily and perversely by giving a new lease on life to the stock market boom. While a relaxation in the stance of fiscal policy will ultimately have to be made, this by itself will not be enough to generate balanced growth in the medium term because, as matters stand, this would be accompanied by a continuing rise in the United States's external deficit and indebtedness. There is probably no way in which sustained and balanced growth can be achieved in the medium term except through coordinated fiscal expansion worldwide.

The difference between the consensus view and that put forward here could not exist without a profound difference in the view of how the economy works. So far as the author can observe, the underlying theoretical perspective of the optimists, whether they realize it or not, sees all agents, including the government, as participants in a gigantic market process in which commodities, labor, and financial assets are supplied and demanded. If this market works properly, prices (e.g., for labor and commodities) get established that clear all markets, including the labor market, so that there can be no long-term unemployment and no depression. The only way in which unemployment can be reduced permanently, according to this view, is by making markets work better, say, by removing "rigidities" or improving flows of information. The government is a market participant like any other, its main distinguishing feature being that it can print money. Because the government cannot alter the market-clearing price of

labor, there is no way in which fiscal or monetary policy can change aggregate employment and output, except temporarily (by creating false expectations) and perversely (because any interference will cause inflation).

No parody is intended. No other story would make sense of the assumption now commonly made that the balance between tax receipts and public spending has no permanent effect on the evolution of the aggregate demand. And nothing else would make sense of the debate now in full swing about how to "spend" the federal surplus as though this were a nest egg that can be preserved, spent, or squandered without any need to consider the macroeconomic consequences.

The view taken here, which is built into the Keynesian model later deployed, is that the government's fiscal operations, through their impact on disposable income and expenditure, play a crucial role in determining the level and growth rate of total demand and output. The circumstances that have generated a budget surplus combined with falling unemployment are not only unusual but essentially temporary. No decision to "spend" a surplus can be taken without regard for the impact on aggregate demand. In any case, there may soon be no surplus to spend.

This paper first looks at where the current growth has come from, examining, in turn, fiscal policy, foreign trade, and private income expenditure and borrowing. This examination shows that current growth is associated with seven unsustainable processes in the United States: (1) the fall in private saving into ever deeper negative territory, (2) the rise in the flow of net lending to the private sector, (3) the rise in the growth rate of the real money stock, (4) the rise in asset prices at a rate that far exceeds the growth of profits (or of GDP), (5) the rise in the budget surplus, (6) the rise in the current account deficit, (7) the increase in the United States's net foreign

indebtedness relative to GDP. The paper then presents a number of medium-term scenarios based on models of the United States and world economies, considers some of their implications, and discusses appropriate policy responses. The appendixes contain notes on the models used and some econometric results.

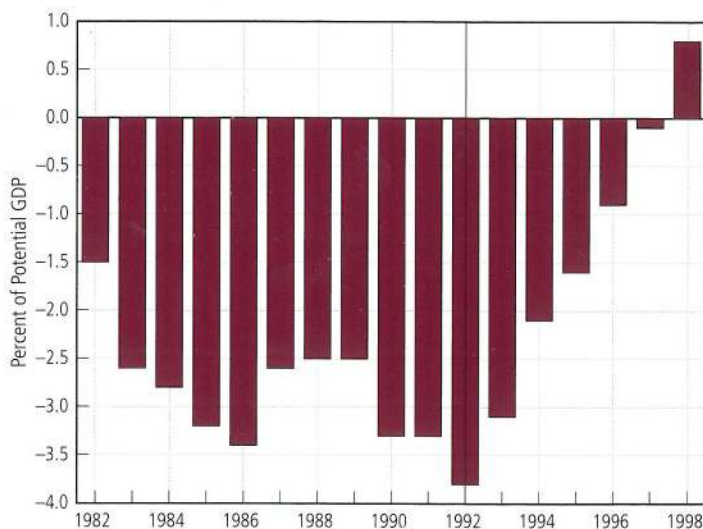
Fiscal Policy

In the United States the public discussion of fiscal policy concentrates almost exclusively on the operations of the federal government. Yet state and local governments account for about a third of all public expenditure and taxes; moreover, their budgets are generally in surplus so that these authorities are now in substantial credit—a fact easily verifiable from the national income and product accounts (NIPA), which show them to be large net receivers of interest and dividend income. In what follows, government inflows and outflows—and debts—will always refer to the operations of the “general government” (the combined federal, state, and local governments).

The stance of fiscal policy is usually measured by the general government structural balance, that is, the size of the budget surplus or deficit, preferably corrected for the business cycle and for inflation. The government’s fiscal stance is said to be neutral if the deficit is small and does not increase, as a share of GDP, through time. Figure 1 portrays the adjusted budget deficit since 1982, showing that fiscal policy was expansionary until 1992 but has been restrictive since then.

The data illustrated in Figure 1 may be supplemented with an alternative but closely related measure of fiscal stance, namely, the “fiscal ratio” or the ratio of government spending to the average rate of taxation. When the budget is balanced, this fiscal ratio will be exactly equal to GDP; it

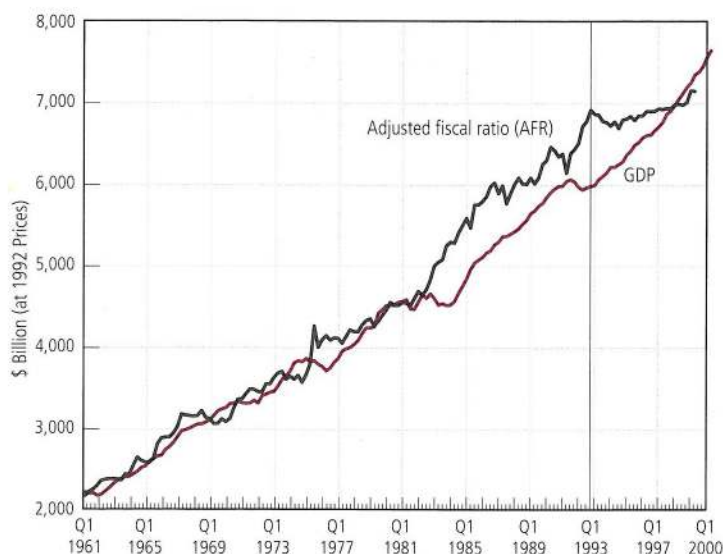
Figure 1 General Government Structural Balance



Note: The vertical line is drawn at 1992 to mark the transition from expansionary to restrictive fiscal policy.

Source: *OECD Economic Outlook*, December 1998.

Figure 2 Adjusted Fiscal Ratio and GDP



Note: In this and the following figures, the vertical line is drawn at 1992Q3 unless otherwise indicated.

Source: Citibase and author’s calculations (see text for details).

will exceed GDP when the budget is in deficit and fall short of it when the budget is in surplus.¹ The advantage of measuring fiscal stance this way is that it makes it easy to make simple inferences about fiscal policy. For instance, we can infer that, with a neutral fiscal stance, real government

expenditure, given the average tax rate, must rise through time at the same rate as GDP; alternatively, tax rates must fall if real government expenditure is held constant.

Corrected for inflation and the business cycle, the adjusted fiscal ratio (AFR) rose, between 1960 and 1992, at an average rate of 3.6 percent per annum, while GDP rose at an average rate of 3.3 percent. As Figure 2 shows, during the last seven years the average growth rate of the AFR was 0.9 percent, while GDP continued to rise at an average rate of 3.3 percent. By this measure, fiscal policy since 1992 has been far more restrictive than during any seven-year period in the last 40 years.

Foreign Trade and Payments

Nor has there been much stimulus to the economy from net export demand. As Figure 3 shows, the current balance of payments has been in continuous and growing deficit throughout the last seven years.

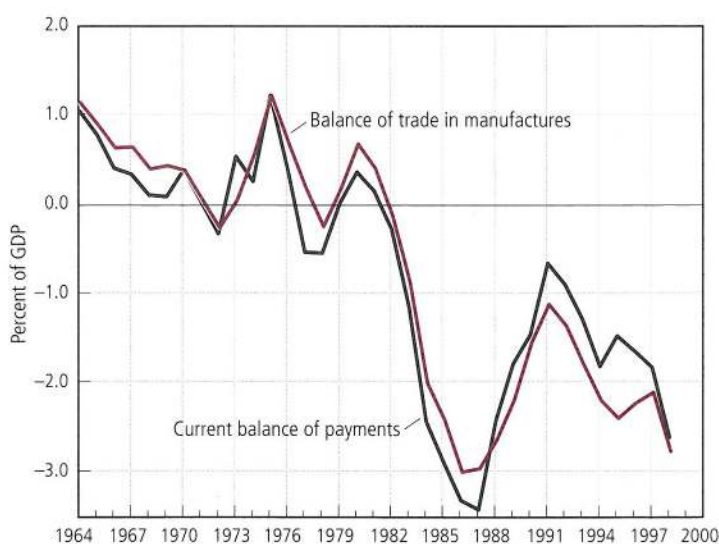
It also shows that the deterioration in the balance of trade in manufactured goods was enough, by itself, to account for the whole deterioration in the current account. Manufactures continue to dominate changes in international trade despite the greatly diminished role of manufacturing as an employer of labor and a generator of value added. In the last few years a perceptible part of the overall deterioration has been caused by trade in computers, which was nearly \$30 billion in deficit in 1998.

The view taken here, for which *prima facie* support is provided in Figure 3, is that the growing current account deficit in the United States has little to do with domestic saving and investment patterns, although there is an accounting identity that links the national saving with the current balance of payments. The growing deficit is mainly the consequence of an increasingly successful invasion of U.S. markets by foreign manufacturers and increased outsourcing of intermediate products. This long-standing adverse trend in trade has been aggravated by the recent collapse of Asian markets and the appreciation of the dollar since 1996.

Whatever the cause, there is no question but that over the “Goldilocks” period as a whole net export demand has made only a weak contribution to the growth of aggregate demand; since the beginning of 1998 its contribution has been negative, even after allowing for the improvement in the U.S. terms of trade, which, taken by itself, had a beneficial effect on the real national income.

To get an overall impression of the effect of foreign trade on aggregate demand during the past 40 years, Figure 4 shows a measure of international trade performance that will be called the “adjusted trade ratio” (ATR). The ATR is constructed according to the same principles as the AFR, that is, it is the ratio of

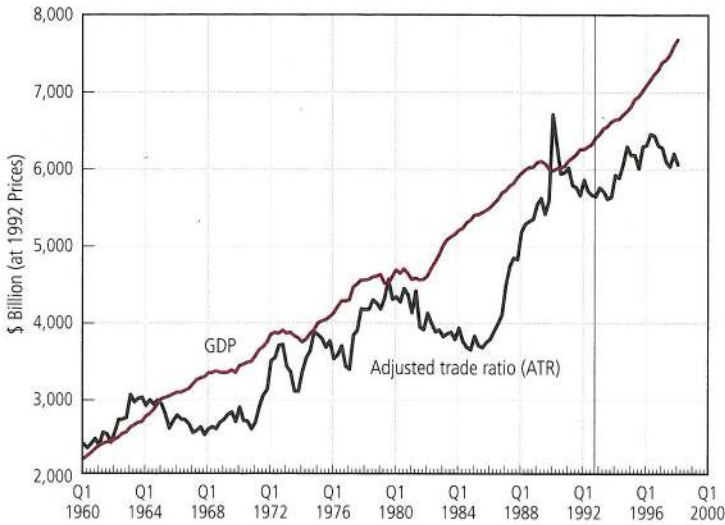
Figure 3 Current Balance of Payments and Balance of Trade in Manufactures



Note: 1998 partly estimated.

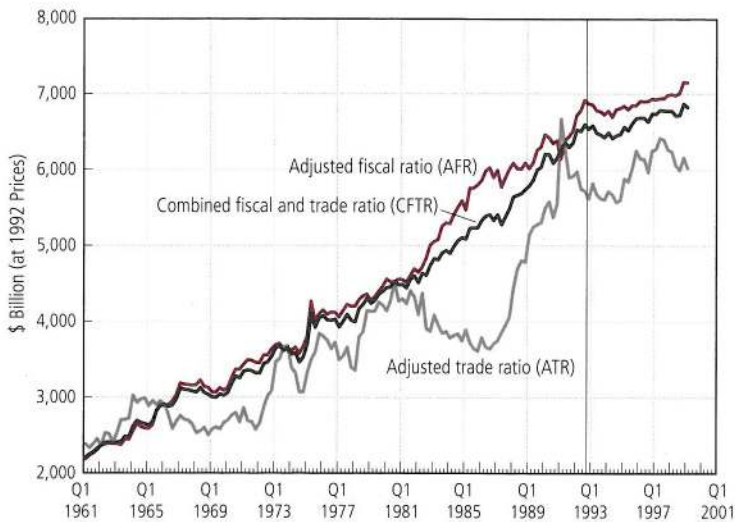
Source: Citibase and author's estimates.

Figure 4 Adjusted Trade Ratio and GDP



Source: Citibase and author's calculations (see text for details).

Figure 5 Combined Fiscal and Trade Ratio



Source: Citibase and author's calculations (see text for details).

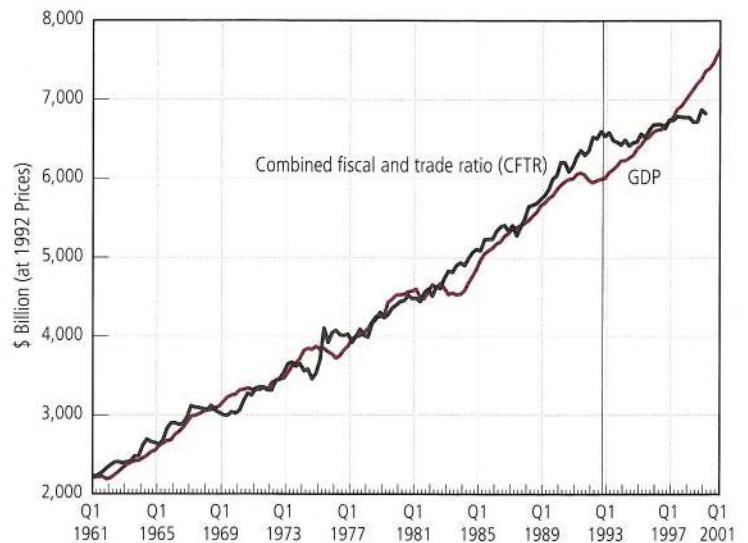
exports and foreign transfers to the average import propensity, with all variables corrected for inflation, relative prices, and the business cycle.²

Figure 5 combines the fiscal and trade ratios into a "combined fiscal and trade ratio" (CFTR).³ The CFTR measures the extent to which these exogenous factors, taken together, fed the growth of aggregate demand; it shows, that is, the extent to

which government expenditure plus exports pumped funds into the economy relative to the rate at which taxes and imports siphoned funds out of it.

The view taken here is that since stocks of assets and liabilities are unlikely to rise or fall indefinitely relative to income flows, the GDP should normally track the CFTR roughly one for one, albeit erratically. The theoretical basis for this view, which has a respectable pedigree starting with Carl Christ (1968) and Blinder and Solow (1973), may be conveyed using a hydraulic analogy. If water (government expenditure plus exports) flows into a receptacle at some given rate, and if a certain proportion of the water (tax payments and imports) flows out of it at some other rate, the level of the water in the receptacle will change. If the water reaches a stable level (regardless of what that level is), at the point at which it stabilizes, outflows must be exactly equal to inflows. Whenever the inflow of government expenditure plus exports is equal to the outflow of taxes plus imports, the level of aggregate income and output must be equal to the CFTR.⁴

Figure 6 Combined Fiscal and Trade Ratio and GDP



Source: Citibase and author's calculations.

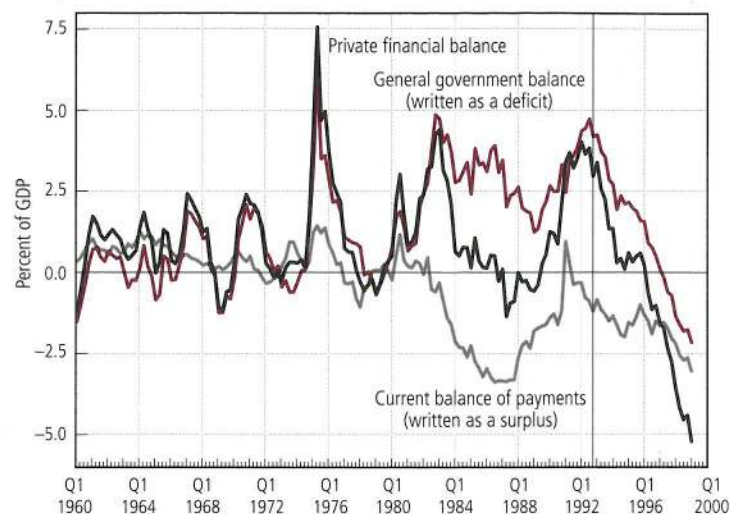
How does this story square with the facts? Figure 6 shows the CFTR together with GDP since 1961. Between 1961 and 1992 GDP did indeed track the CFTR one for one, if erratically. Since the beginning of 1992, while GDP has risen 3.3 percent per annum, the CFTR has risen only 0.6 percent per annum. However skeptical the reader may be concerning our stock/flow model, there is no gainsaying the facts displayed in Figure 6—net demand from the government and net exports since 1992 have been much weaker than in any other period since 1960.

Private Saving, Spending, and Borrowing

How could the economy expand so fast after 1992 seeing that the arterial flows that normally make it grow were so sluggish? An answer is suggested in Figure 7, which shows the three major financial balances: the private financial balance between total income and expenditure, the general government balance, and the current balance of payments. As every student of the NIPA knows, these three balances must, by accounting identity, sum to zero. In Figure 7 public borrowing is given a positive sign so as to make it crystal clear that the private *deficit* is always exactly equal to the public *surplus* plus the balance of payments *deficit*. The intuition that underlies this rearrangement of the numbers is that public deficits and balance of payments surpluses create income and financial assets for the private sector whereas budget surpluses and balance of payments deficits withdraw income and destroy financial assets. This method of presenting the figures makes the way financial assets and income are created for the private sector quite transparent.

As the budget balance during the last seven years has changed by a larger amount than ever before (at least since the

Figure 7 The Three Major Financial Balances



Source: Citibase and author's calculations.

early 1950s) and has reached a record surplus (2.2 percent of GDP in the first quarter of 1999) and as the current balance of payments has deteriorated rapidly, it comes as no surprise to find that the private sector balance has moved south as well, again by a record amount and reaching a record deficit (5.2 percent of GDP in the first quarter of 1999).

The scale of the private financial deficit, though subject to revision, cannot be called into question (significantly) by any redefinition of personal income, saving, consumption, or investment. The private financial deficit measures something straightforward and unambiguous; it measures the extent to which the flow of payments⁵ into the private sector arising from the production and sale of goods and services exceeds private outlays on goods and services and taxes, which have to be made in money. While capital gains obviously influence many decisions, they do not by themselves generate the means of payment necessary for transactions to be completed; a rise in the value of a person's house may result in more expenditure by that person, but the house itself cannot be spent. The fact that there have been capital gains can therefore be only a partial explanation of why the private sector has moved

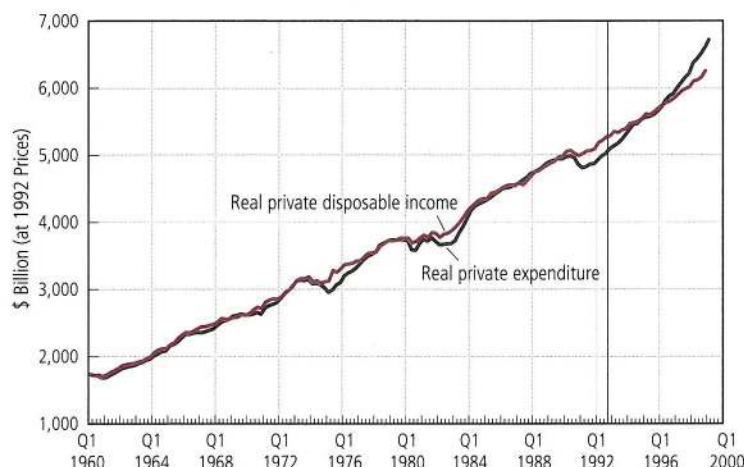
into deficit. There has to be an additional step; money balances must be run down (surely a very limited net source of funds) *or* there must be net realizations of financial assets by the private sector as a whole *or* there has to be net borrowing from the financial sector. Furthermore, a capital gain only makes a one-time addition to the stock of wealth without changing the flow of income. It can therefore, by its very nature, have only a transitory effect on expenditure. It may take years for the effect of a large rise in the stock market to burn itself out, but over a strategic time period, say 5 to 10 years, it is bound to do so.

While Figure 7 implies that private expenditure has been exceeding income by growing amounts, it tells us nothing directly about what has caused the expansion of the economy. For all that Figure 7 contains, the growth in private expenditure relative to income could have been accompanied by an absolute fall in both series. Figure 8, which shows private income and expenditure separately, puts it beyond doubt that it is the rapid relative rise in private expenditure that has been the main driving force behind the U.S. expansion since 1991–1992.

It has occasionally been said that the rise in private expenditure relative to income is the expected and healthy consequence of the budget tightening that, by reducing interest rates, has stimulated investment. This would be the explanation suggested by many modern textbooks on macroeconomics.

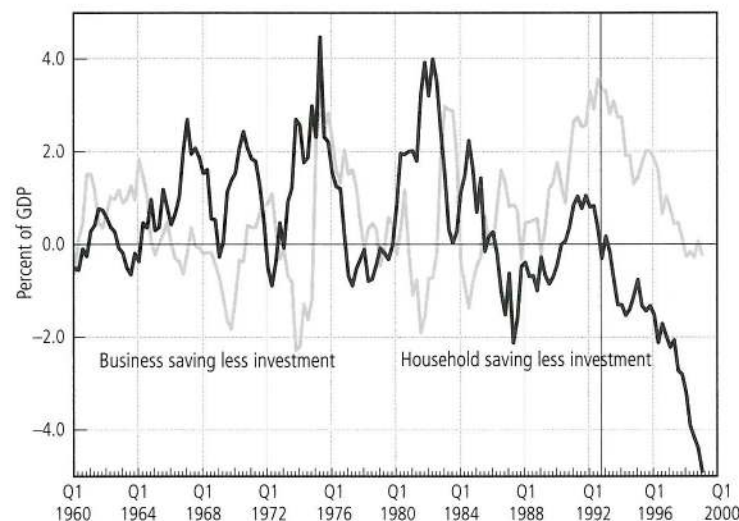
But, as Figure 9 demonstrates, this explanation is clearly incorrect. There has been a moderate increase in business investment, which rose from 9 percent of GDP in 1992 to 11 percent at the beginning of 1999. But, in 1992 the business sector was so substantially in surplus (that is, undistributed profits were so substantially in excess of investments) that it has only just moved south of the zero line; in recent quarters almost all business investment

Figure 8 Real Private Expenditure and Disposable Income



Source: Citibase and author's calculations.

Figure 9 Analysis of Private Financial Deficit



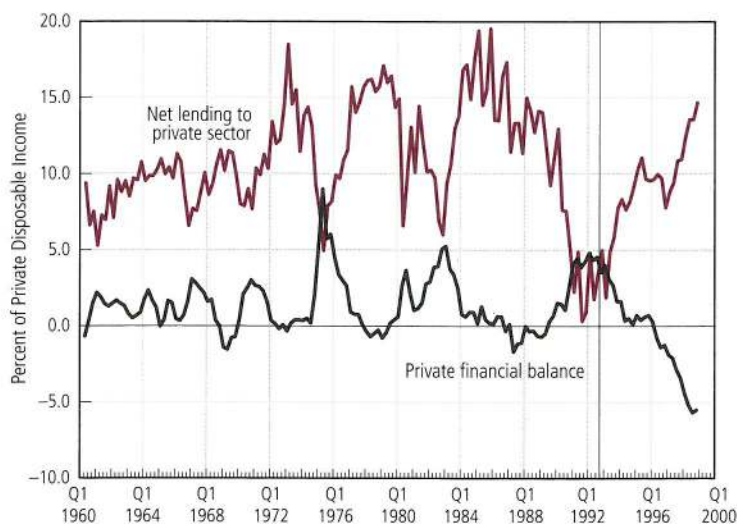
Source: Citibase and author's calculations.

was financed from internally generated funds. As the figure shows, most of the fall in the private balance and the entire deficit has taken place in the household sector. It is the excess of personal consumption and housing investment over personal disposable income that is now much larger than ever before.

The descent of the private sector into financial deficit means that the sector as a whole has become a net borrower (or a net

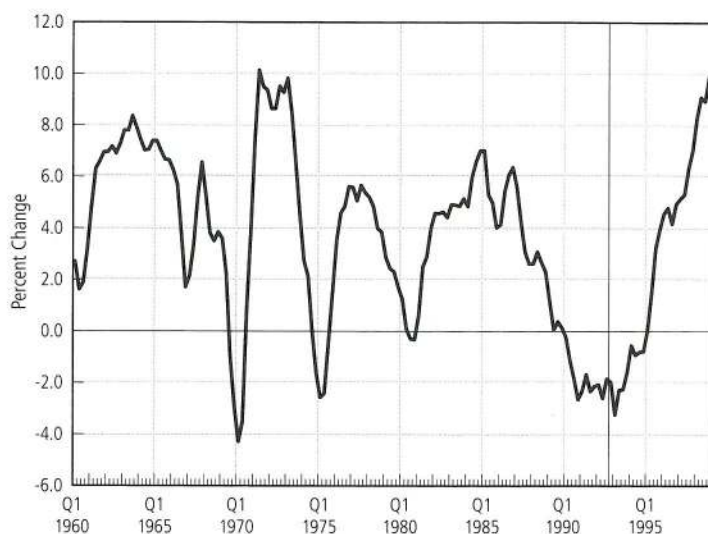
seller of financial assets) on a record and growing scale. Figure 10 illustrates the inverse relationship between the flow of net lending to the nonfinancial private sector (derived from the Flow of Funds) and the balance of private income and expenditure (derived from the NIPA). It shows, in particular, that the annual rate of net lending rose fairly steadily from about 1 percent of disposable income (\$40 billion) at the end of 1991 to 15 percent (over \$1 trillion) in the first quarter of 1999. However, while the private financial deficit was far larger than ever before, the flow of net lending in the fourth quarter was some way from being a record. Ignoring the possibility that the figures will be revised, the reasons for this may be, first, that leasing of motor vehicles has increased (the underlying purchase presumably now consisting of fixed investment by the financial sector). Second, households have also been able, up to a point, to make net realizations of capital gains without borrowing and without causing the market to move against them because firms have been repurchasing equity while foreigners have been making large net purchases of U.S. stocks.

Figure 10 Private Financial Balance and Net Lending to Private Sector



Source: Citibase, Flow of Funds, and author's estimates.

Figure 11 Growth in Real (Deflated) Stock of Money (M3), Compared with a Year Earlier



Source: Citibase, Flow of Funds, and author's estimates.

Figure 11 shows the annual rate of growth in the real stock of money (M3) compared with the year earlier. It rose from minus 3 percent in 1992 to nearly 10 percent at the beginning of 1999. The growth rate of the real money stock during the past year far exceeds the high rates of the mid 1980s and has reached the extremely high rates of the early 1970s. The expansion in money supply growth is the flip side of the credit expansion illustrated in Figure 10 and confirms that the growth of net lending did indeed continue up to the first quarter of 1999.

The Strategic Prospects

The central contention of this paper is that, given unchanged fiscal policy and accepting the consensus forecast for growth in the rest of the world, continued expansion of the U.S. economy requires that private expenditure continues to rise *relative to income*. Yet while anything can happen over the next year or so, it seems impossible that this source of growth can

be forthcoming on a strategic time horizon. The growth in net lending to the private sector and the growth in the growth rate of the real money supply cannot continue for an extended period. Moreover, if, *per impossibile*, the growth in net lending and the growth in money supply growth were to continue for another eight years, the implied indebtedness of the private sector would then be so extremely large that a sensational day of reckoning could then be at hand. In sum, if a truly strategic view is taken, covering the next 10 to 15 years, one is forced to the conclusion that the present stance of policy is fundamentally out of kilter and will eventually have to be changed radically.

Projections Based on CBO Forecasts

To illustrate the scale of the problem, some simulations were done that show what has to be assumed about private income, expenditure, and borrowing to validate the CEA's forecasts. Figure 12 gives projections of the three major financial balances between now and 2008. It was assumed,

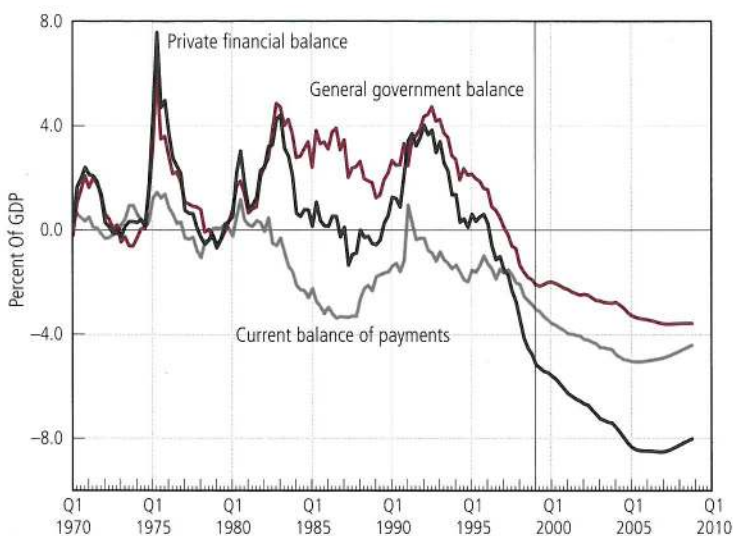
with the CBO's April projection, that GDP grows at 2.0 to 2.4 percent and that inflation is stable at 2.1 percent. The projected surplus of the general government was derived by taking an average of the two projections that the CBO makes, adding (about) 1 percent of GDP to allow for the surpluses of state and local governments and scaling the result to harmonize with national income concepts.

For the balance of payments, a projection of output over the next five years (to 2004) in every foreign country or country "bloc" was made, using consensus forecasts and adding them together using U.S. shares in each bloc's imports.⁶ For the rest of the period (from 2004 to 2008), it was assumed that (non-U.S.) world output grows at its long-term average rate. Estimates of the U.S. balance of trade were then derived using standard equations describing the behavior of export and import volumes and prices, assuming no further change in exchange rates. These projections are believed to be noncontroversial, given the medium-term outlook for the United States's main markets and given its well-attested high income elasticity of demand for imports. The projected trade balance improves perceptibly after 2004 because of an assumed recovery in world production and trade, but the effect of this on the balance of payments is muted by a rise in factor income payments as net indebtedness soars toward \$6 trillion, or nearly 45 percent of GDP.⁷

Accordingly, the growing budget surplus projected by the CBO, taken in conjunction with the balance of payments projections shown in Figure 12, carries the implication, since the three balances must sum to zero, that the private sector deficit continues to rise for the next six or seven years and even then does not fall significantly.

Figure 13 shows the history of the private surplus and net lending (reproducing,

Figure 12 The Three Major Financial Balances, Actual 1970–1999Q1 and Projections Implied by CBO



Note: Data after 1999Q1, where the vertical line is now drawn, are author's projections.
Source: Citibase, Flow of Funds, and author's projections.

for the past, the material in Figure 10) together with projections of both series into the medium-term future. If expenditure continues to rise relative to income,

the flow of net lending must go on rising as well.

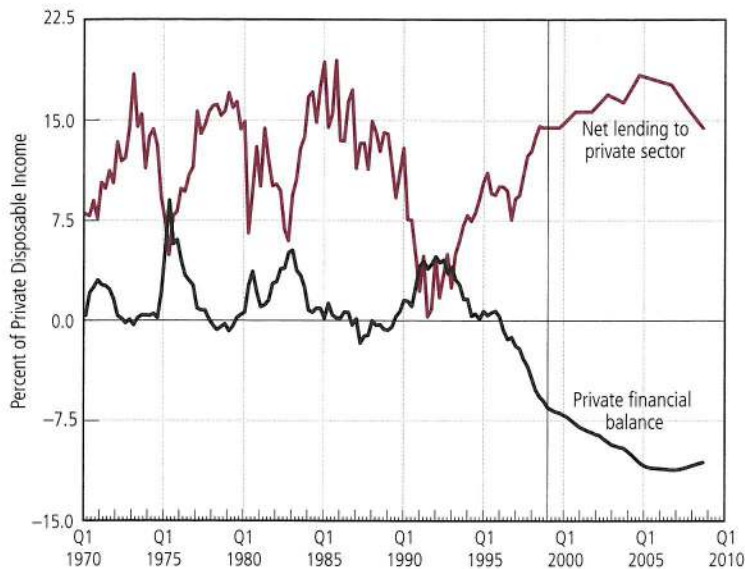
The implications of these forecasts are revealed in Figure 14, which shows the implied level of debt relative to disposable income. If the flow of net lending continues at 15 percent or more of disposable income, the rise in the burden of indebtedness would accelerate away from its present record level of about 1.6 percent of disposable income, nudging 2.5 percent toward the end of 2008, and still rising rapidly after that. While the stock exchange boom has generated so much wealth that the existing level of indebtedness may not, in general, pose a threat to private balance sheets at the moment, the same thing could hardly be true if indebtedness rises two or threefold (or more) compared with its existing level.

Digression on the External Debt and Deficit

Should expansion, against the odds, continue in the medium term in the way foreseen by the Council of Economic Advisers, the consequences for the United States's balance of payments and net foreign indebtedness could be serious. It is often assumed that balance of payments deficits have a powerful tendency to correct themselves, but this runs contrary to the experience of many countries (for instance, Denmark and Australia within the last 20 years) where the accumulation of foreign debt led eventually to a painful period of retrenchment. There is certainly no tendency at the present time for the dollar to fall in the way needed to generate an improvement in net export demand—quite the contrary.

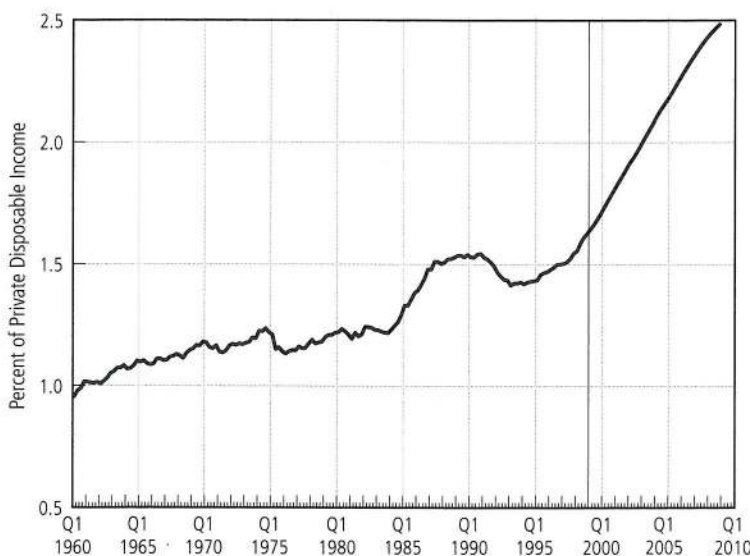
Figure 15 shows the scale of the United States's foreign indebtedness implied by the balance of payments projections in Figure 12. In the 1999 *Economic Report of the President* (ERP), the CEA takes the possibility of a chronic, rising deficit very

Figure 13 Private Financial Balance and Growth of Nonfinancial Debt, Actual 1970–1999Q1 and Projections Implied by CBO



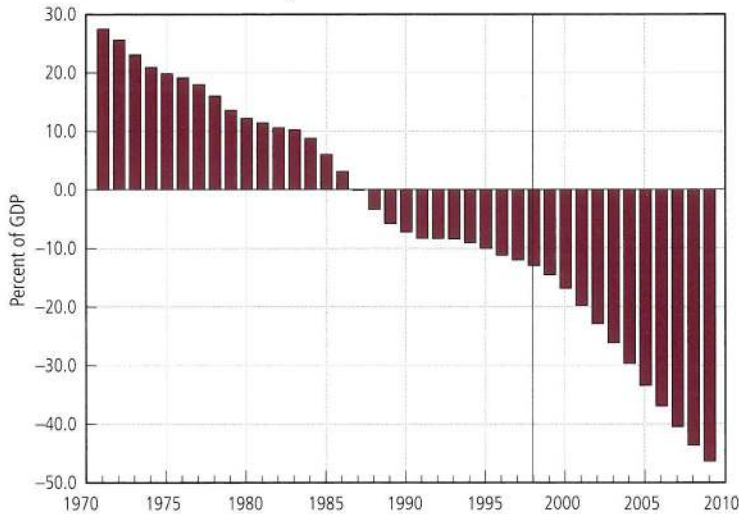
Note: Data after 1999Q1 are author's projections.
Source: Citibase, Flow of Funds, and author's calculations.

Figure 14 Private Debt, Actual 1960–1999Q1 and Projection Implied by CBO



Note: Data after 1999Q1 are author's projections.
Source: Citibase, Flow of Funds, and author's calculations.

Figure 15 U.S. Net Foreign Assets, Actual and Projected



Note: Data after 1998 are author's projections.
 Source: Author's calculations using official benchmark.

calmly. The ERP notes that the deficit, by virtue of an accounting identity, is always exactly matched, one for one, by an inflow of capital, aka net borrowing, from abroad. The ERP also argues that this borrowing from abroad may not be a bad thing if it gives rise to profitable investment that raises U.S. productivity. To support this point, the ERP contains a chart (19-11) that shows the scale of inward and outward direct investment in recent years. It also argues that holdings of U.S. equities by foreigners should not "count" as debts.

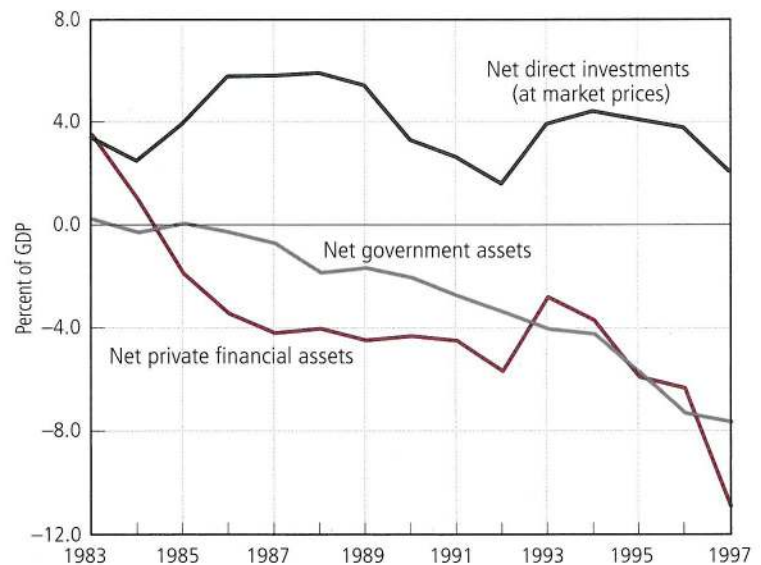
The ERP is not convincing on either of these points. The figures relating to net foreign direct investment do not support the notion that this did anything for U.S. productivity. For one thing, U.S. direct investment abroad has generally exceeded foreign direct investment in the United States, so *net* direct investment has made a *negative* contribution to the financing of the current account deficit. For another, foreign direct investments in the United States have performed poorly, if their profit record is anything to go by. It is because the rate of profit earned on foreign direct investments in the United

States was so much below that on U.S. direct investments abroad that it was not until last year that net payments of factor income across the exchanges finally turned negative, although the United States became a net debtor in 1989.

And while it is true that equity issued by a corporation is not part of its indebtedness, U.S. equities held by foreigners have not been issued by the United States *as a country*. Equities give rise to payments of factor income by the United States to foreigners in just the same way as government bonds do and they can as easily be liquidated.

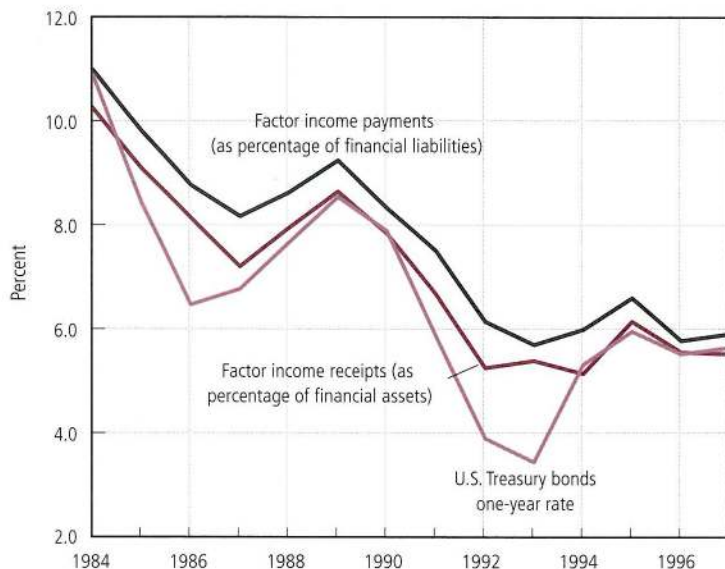
Figure 16 analyzes net holdings of overseas assets into direct investments, private holdings of financial assets, and government holdings of financial assets. It will be seen that, so far as direct investment is concerned, the United States has remained a creditor, with net assets valued at current market prices averaging around 4 percent of GDP in recent years. All the large changes have been in holdings of financial assets; net private holdings fell rapidly, to minus 11 percent of GDP at the end of

Figure 16 Breakdown of Net Foreign Assets (Stocks)



Source: Citibase, Flow of Funds, and author's projections.

Figure 17 "Interest" Rates on Foreign Assets and Liabilities



Source: *Survey of Current Business* and author's calculations.

1997, and government holdings fell to minus 7.5 percent of GDP.

Figure 17 shows payments and receipts of factor income derived from financial assets and liabilities expressed as a proportion of the relevant stock (lagged one year), and these quasi-interest rates are compared with the rate on one-year U.S. Treasury bonds. The rate of "interest" on financial liabilities has consistently exceeded that on assets and is also in excess of the normal growth rate. Accordingly, if the trade forecasts are correct, net payments of factor income by the United States will rise steadily from now on, accelerating the growth in the current account deficit and the rise in the United States's net indebtedness. The process described is clearly unsustainable and will eventually have to be checked, preferably before an exchange crisis forces the issue.

Alternative Scenarios Based on Different Assumptions about Private Sector Behavior

To illustrate a range of outcomes, Figures 18 and 19, which should be read together, show alternative scenarios based on six dif-

ferent assumptions about private sector behavior. The numbers from which the charts have been drawn are taken from simulations of two econometric models, one describing the U.S. economy, the other describing production in and trade between the eleven country blocs that taken together constitute the whole world. Although based on computer models that cannot be made readily accessible to the reader, it is hoped that the charts, together with the argument in the text, will carry *prima facie* evidence. The heart of the argument is that if the seemingly impossible rise in indebtedness shown in Figure 14 is required to keep the U.S. economy rising at 2.4 percent per annum (the minimum needed to keep unemployment from rising), any slower growth in net lending will cause a slowdown in output large enough to cause unemployment to rise.

Figures 18 and 19 show six different possibilities regarding the future course of the private financial balance and their counterparts in terms of private indebtedness. No pretense of knowledge is made regarding the likelihood of any of these outcomes. On the contrary, it is emphasized that yet other outcomes, not illustrated in the chart, are perfectly likely to occur and the turning point could come earlier or later. Despite these great uncertainties the important conclusion remains that the present stance of fiscal and trade policies will have to be radically changed at some stage during the first decade of the new millennium.

Implications for the United States

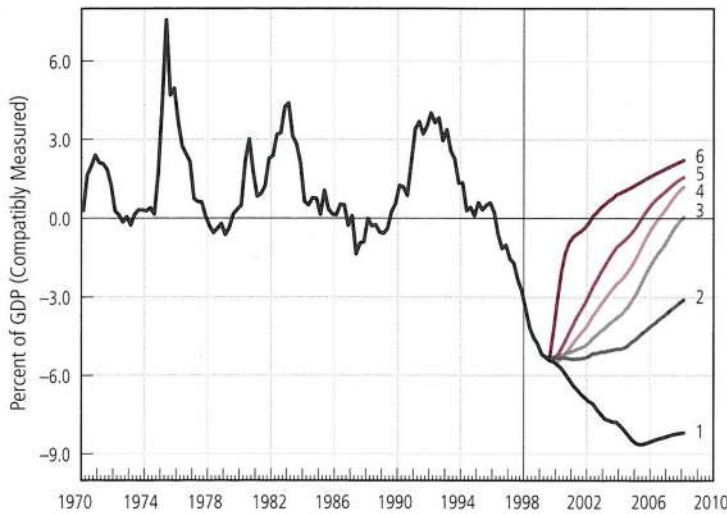
Projection 1, which reproduces (what must be held to be) the CBO's version of future events, has already been dismissed as implausible in view of the apparently absurd increase in private indebtedness it implies. The other projections are meant to encompass a fair range of plausible outcomes based on different assumptions about future levels of indebtedness and the

behavior of the stock market. Projection 2 bears an approximate resemblance to the projection recently published by the IMF (*World Economic Outlook 1999*), which puts the private sector deficit at about 5 percent of disposable income in 2003, and it is for this reason that it is included here. In the author's opinion the growth of indebtedness implied by the IMF projection is still

Table 1 Implications of the Six Projections for the United States

| Projection | Average Growth of GDP, 1998–2003 | Unemployment Rate in 2003 | General Government Balance in 2003 (% of GDP) | Balance of Payments in 2003 (% of GDP) |
|------------|----------------------------------|---------------------------|---|--|
| 1 | 2.34 | 4.8 | 2.9 | -5.8 |
| 2 | 1.51 | 6.0 | 1.1 | -3.9 |
| 3 | 1.18 | 6.5 | 0.4 | -3.6 |
| 4 | 0.79 | 7.3 | -0.5 | -3.3 |
| 5 | 0.49 | 8.1 | -1.4 | -2.9 |
| 6 | -0.10 | 9.6 | -2.9 | -2.8 |

Figure 18 The Private Financial Balance on Six Different Assumptions



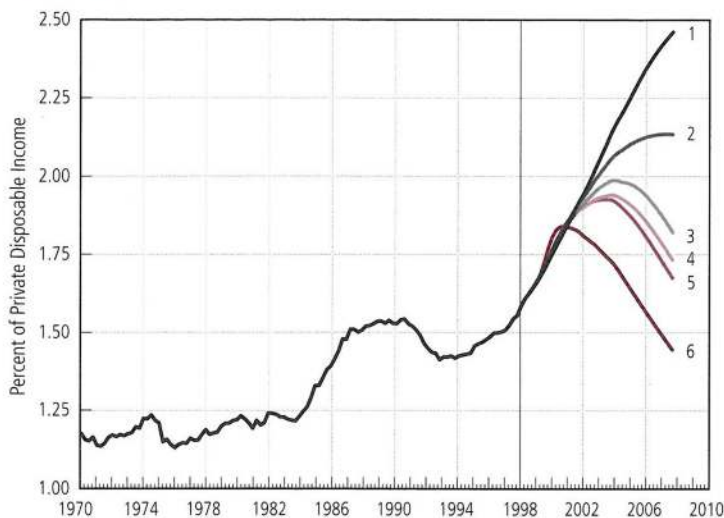
Note: Data after 1998 are author's projections.
Source: Citibase and author's projections.

implausibly large—and unsustainable in the long term. At the other extreme, projection 6 is based on the assumption that there is a 40 percent break in the stock market in the fourth quarter of 1999 and that this is accompanied by a fall in net lending and a decline in indebtedness to levels last seen in the mid 1990s.

As already mentioned, every one of projections 2 through 6 implies an unacceptably low growth rate, taking the average over several years for the United States. Table 1 shows the indicators that are of greatest interest. Column 2 shows, for each projection, the implied average growth rate between 1998 and 2003, the purpose being to convey the character of the whole period rather than to forecast what will happen in any particular year. Columns 3, 4, and 5 give counterpart numbers for unemployment, the general government balance, and the balance of payments. As these numbers are generated mechanically out of the particular paths assumed to construct the long-run projections, they should not be interpreted literally as describing what might happen in the particular year 2003.

The figures speak for themselves. They say that the United States now runs a serious risk of suffering a prolonged period of stagnation (or worse), with rising unemployment throughout the next five years and beyond. The budget surplus could

Figure 19 Private Debt on Six Different Assumptions



Note: Data after 1998 are author's projections.
Source: Citibase, Flow of Funds, and author's projections.

wither even if there were no relaxation of fiscal policy. And, the balance of payments looks set to remain in substantial deficit.

Implications for the Rest of the World

To generate the results in the table above, projections from our model of the U.S. economy were used, in a process of successive approximation, in conjunction with a model of world trade and production. More precisely, each projection of developments in the United States incorporates assumptions about world production (required to

by changes in commodity and oil prices. But the model does have the great advantage of being comprehensive, in the sense that it encompasses the entire world and its solutions allow (if crudely) for the interdependence of world production and trade.

The extent to which foreign countries are affected by recession in the United States depends on the extent of their openness, in particular to direct and indirect trade with the United States, and on the extent to which they are net exporters or importers of raw materials and energy. Thus Japan is comparatively unaffected partly because, as a big net importer of raw materials and fuel, it gains substantially from an improvement in the terms of trade, which boosts real income.

It is noteworthy that by far the greatest impact of a severe recession in the United States would be experienced in South America, Asia, and "other developed countries," in particular Canada and Australia. The effects on Europe are relatively small but large enough, in the worst case, to add 2 million or more to unemployment.

For all the crudity of the models being used, the figures in the table sound an alert, to put it moderately, as to the potentially grave effects of a severe recession in the United States on the rest of the world, much of which will still be reeling from the blows suffered in 1997 and 1998.

Table 2 Percentage Shortfall of GDP in 2003 Compared with Base Projection

| Country Bloc | Projection | | | | |
|------------------------------|------------|------|------|------|-------|
| | 2 | 3 | 4 | 5 | 6 |
| United States | -3.8 | -5.5 | -7.5 | -9.2 | -11.6 |
| Western Europe | -0.7 | -1.0 | -1.3 | -1.6 | -2.0 |
| Japan | -0.7 | -1.0 | -1.3 | -1.6 | -2.1 |
| South America | -2.5 | -3.6 | -4.8 | -5.8 | -7.3 |
| Other developed countries | -2.3 | -3.3 | -4.5 | -5.5 | -6.7 |
| Asia | -2.1 | -3.0 | -4.1 | -5.0 | -6.3 |
| China | -1.8 | -2.6 | -3.5 | -4.3 | -5.4 |
| Middle East | -2.0 | -2.9 | -3.8 | -4.5 | -5.0 |
| Russia | -1.0 | -1.4 | -1.9 | -2.3 | -2.0 |
| Africa | -1.3 | -1.9 | -2.5 | -3.0 | -3.7 |
| Eastern Europe | -0.4 | -0.4 | -0.6 | -0.8 | -1.2 |
| World (except United States) | -1.2 | -1.8 | -2.3 | -2.9 | -3.6 |

generate projections of U.S. exports) that have been modified by the implied fall in exports to the United States compared with what otherwise would have happened. Table 2 shows how output in each country bloc might be affected going from one projection to the next.

The world model from which these estimates are derived is extremely simple, with ripples generated solely by the foreign trade multiplier effects (that is, by income reductions caused by falling exports) and

Policy Considerations

The main conclusion of this paper is that if, as seems likely, the United States enters an era of stagnation in the first decade of the new millennium, it will become necessary *both* to relax the fiscal stance and to increase exports relative to imports. According to the models deployed, there is no great technical difficulty about carrying out such a program except that it will be difficult to get the timing right. For

instance, it would be quite wrong to relax fiscal policy immediately, just as the credit boom reaches its peak. As stated in the introduction, this paper does not argue in favor of fiscal fine-tuning; its central contention is rather that the whole stance of fiscal policy is wrong in that it is much too restrictive to be consistent with full employment *in the long run*. A more formidable obstacle to the implementation of a wholesale relaxation of fiscal policy at any stage resides in the fact that this would run slap contrary to the powerfully entrenched, political culture of the present time.

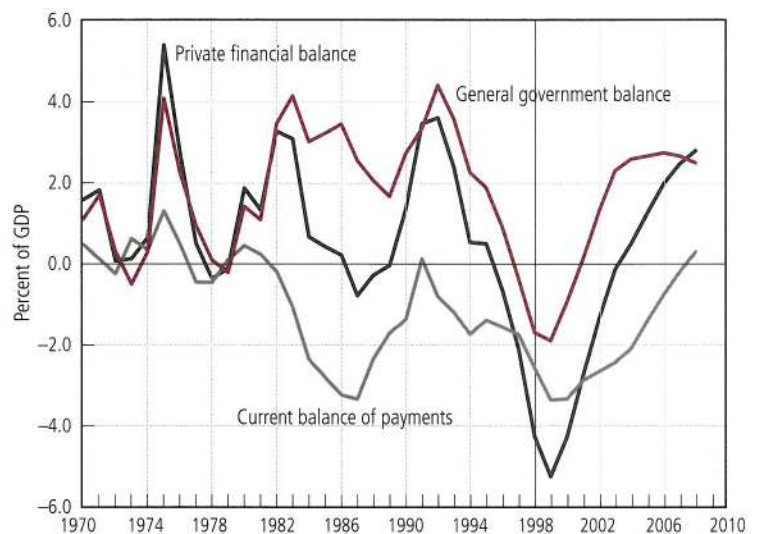
The logic of this analysis is that, over the coming five to ten years, it will be necessary not only to bring about a substantial relaxation in the fiscal stance but also to ensure, by one means or another, that there is a structural improvement in the United States's balance of payments. It is not legitimate to assume that the external deficit will at some stage automatically correct itself; too many countries in the past have found themselves trapped by exploding overseas indebtedness that had eventually to be corrected by *force majeure* for this to be tenable.

There are, in principle, four ways in which the net export demand can be increased: (1) by depreciating the currency, (2) by deflating the economy to the point at which imports are reduced to the level of exports, (3) by getting other countries to expand their economies by fiscal or other means, and (4) by adopting "Article 12 control" of imports, so called after Article 12 of the GATT (General Agreement on Tariffs and Trade), which was creatively adjusted when the World Trade Organization came into existence specifically to allow *nondiscriminatory* import controls to protect a country's foreign exchange reserves. This list of remedies for the external deficit does *not* include protection as commonly understood, namely, the selective use of tariffs or other discrim-

inatory measures to assist particular industries and firms that are suffering from relative decline. This kind of protectionism is not included because, apart from other fundamental objections, it would not do the trick. Of the four alternatives, we rule out the second—progressive deflation and resulting high unemployment—on moral grounds. Serious difficulties attend the adoption of any of the remaining three remedies, but none of them can be ruled out categorically.

While a proper discussion of all these issues would be beyond the scope of this paper, a final simulation is presented in which the problems that have been raised are assumed to have been solved. The story is put forward with great diffidence for no one knows better than the author how little is really known about how all the key relationships—import and export price and volume elasticities, the elasticity of responses of government payments and receipts, and so forth—will behave in the future. However, the models can be used to give answers, of a kind, concerning the

Figure 20 Goldilocks Resuscitated



Note: Data after 1998 are author's projections.
Source: Citibase, Flow of Funds, and author's projections.

possible magnitudes of policy changes that may be required.

The data illustrated in Figure 20 were derived by superimposing on projection 5 whatever fiscal expansion plus (effective) dollar devaluation is necessary to generate the growth of output assumed in the CBO projections (growth just enough to keep unemployment close to its present low level) and an improving balance of payments. Specifically, it was necessary to raise total general government outlays (including transfers but not interest payments) in stages by about 16 percent—corresponding to about \$400 billion per annum at current prices—compared with what the CBO is at present projecting.⁸ Also necessary was an effective 20 percent depreciation of the dollar at the end of 1999, which “sticks” throughout the rest of the period.

As Figure 20 illustrates, these changes, which generate a 2.4 percent average growth rate between 2000 and 2008, are compatible with the reversion of balance of payments to zero by the end of the period (notwithstanding greatly increased factor income payments abroad). But they also imply (given that the private financial balance recovers to its normal level) that the budget of the general government goes into deficit to roughly the extent that was normal in the 1970s and 1980s. Parallel simulations of the world model suggest that the net effect of these measures on output in the rest of the world would be positive, but small; the positive effect of higher U.S. output on other countries’ exports would just offset the reduction of their net exports as a result of the dollar depreciation.

Appendix 1. A Private Expenditure Function

This paper has so far been written as though it were more or less self-evident that total private expenditure has a systematic and predictable relationship with total private disposable income and the flow of net lending to the private sector. A relationship of this kind (once known as the New Cambridge equation) was presented in Fetherston and Godley (1978) and criticized by Alan Blinder (1978) on the grounds that the aggregation of consumption with investment did not make sense in terms of any known theories of consumption and investment taken individually. Blinder did, however, generously conclude that

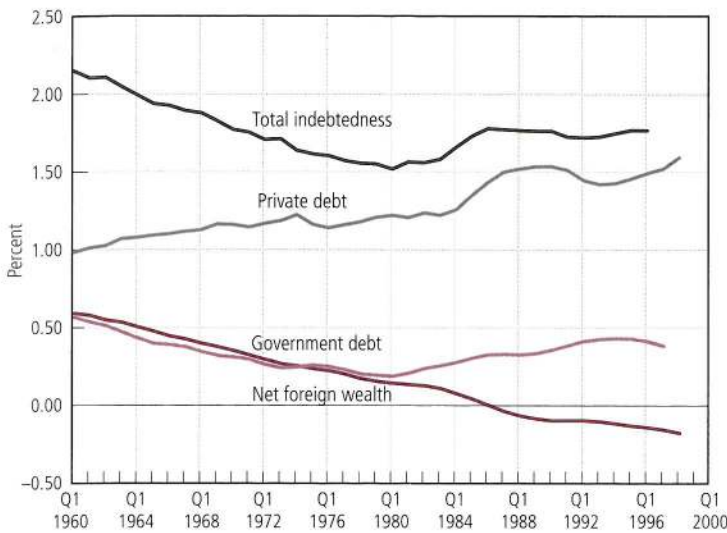
To the credit of the New Cambridge group . . . the one feature of the model that Fetherston and Godley clearly label as absolutely essential to New Cambridge is also the one feature that should elicit the greatest interest on this side

of the Atlantic: the unusual specification of aggregate private expenditure. I rather doubt that the sum of consumption and investment spending can be explained very well by the sum of disposable income plus retained earnings, and its lagged value, in the U.S. But, if it can be, American Keynesians will have to reexamine the prevailing models of consumer and investor behavior. An empirical study of this question in the U.S. would be most welcome, and would really decide whether there is anything in New Cambridge that we in America should import.

What follows is a justification of the aggregation in question, at least for the limited purpose of underpinning the conclusions drawn in this paper.

Figure A1 shows government debt, foreign wealth, and (nonfinancial) private sector net debt (all expressed as a proportion of private disposable income) since 1960. The net indebtedness of the U.S. general government is now just under 30 percent of GDP, compared with 43 percent for the

Figure A1 Selected Assets and Liabilities as a Percent of Private Disposable Income



Source: Citibase, Flow of Funds, and author's calculations.

federal government taken by itself.⁹ Net foreign assets, in the absence of official figures for more than a short period, has been calculated by cumulating the current account balance using the published figure for 1983 as a benchmark. The figure for private indebtedness was taken from the Flow of Funds accounts.

It will be seen that total indebtedness, D , taking government, foreign, and private sectors together, was relatively stable as a percent of private disposable income, never far from a 1.7 percent mean, while movements of its component parts tended to offset one another. The variance in the ratio of D to income (.027) was smaller than that of either private debt, DP (.029), or foreign wealth, VF (.053). The variance of government debt, DG , was only 0.009, but that is to be expected given that the variance of D was relatively small and that DP and VF happened to move in opposite directions.

Write the debt identity

$$(1) D = DP + DG + VF$$

where DP is private debt, DG is public debt, and VF is net foreign wealth. Its first difference is

$$(2) \Delta D = (GL - R) + (G - T) + BP$$

where GL is gross lending to the private sector, R is repayments of private debt, G is government outlays, T is government receipts, BP is the current balance of payments, and D is a first difference operator.

Equation 2, by simple rearrangement of national income identities, becomes

$$(3) \Delta D = (YD + GL) - (PX + R) = \Delta V$$

where YD is total private disposable income, PX is total private expenditure (that is, consumption and investment combined), and V is liquid financial assets. The terms in the first parentheses on the right-hand side of equation 3 describe the total cash flow into the private sector each period, and the terms in the second parentheses describe total outflows. So the change in total debt (ΔD), taken across the economy, is defining an accumulation of liquid financial assets (ΔV) by the private sector.

If it could be established that the desired stock of the category of assets defined by this cash flow identity is reasonably stable relative to income, it would follow, on hydraulic principles alone, that outflows (i.e., total expenditures) would track inflows one for one with a mean lag equal to the stock/flow norm (Godley and Cripps 1982, 64–65). The numbers in Figure A1 are consistent, *prima facie*, with the hypothesis that there is a stock/flow norm that is fairly small and stable.

To derive an estimating equation, a norm for the stock/flow ratio was postulated:

$$(4) V^* = \alpha 1.YD$$

Some adjustment process was also postulated:

$$(5) \Delta V = F1(V^* - V_{-1})$$

where F1 describes a function.

Equations 1, 4, and 5 imply a relationship between inflows, outflows, and stocks:

$$(6) PX = F2(\Delta L, YD, V_{-1})$$

where ΔL is net lending ($GL - R$) and F2 is another function.

For the estimating equation, PX , YD , and V were deflated using a price index for private expenditure as a whole (to become PXR , YDR , and VR). Real net lending was disaggregated into its three major component parts—consumer credit (DD1), other personal borrowing, mainly mortgages (DD2), and business borrowing (DD3). Terms have also been included that describe real stock market (PFA) and real (second-hand) house prices (PH).¹⁰ The inclusion of the stock market and house price terms, given that the real stock of financial assets is an argument, implies that a step rise in stock prices, even if the step is an enduring one, has only a transitory effect on the expenditure flow; a permanent rise in the (level of the) expenditure flow would require a perpetual increase in stock prices.

Using quarterly data from the first quarter of 1968 to the third quarter of 1998,

an autoregressive distributed lag model (ARDL) of equation 6 was specified, with up to five quarterly lags in each variable. Model selection criteria were used to choose the preferred order of lags. This procedure, described in the Microfit econometric software package, provides a single equation approach to cointegration analysis. The specification selected has two lags on the dependent variable and one on DD1, the variable that describes the (deflated) net flow of consumer credit. From the selected specification the estimated long-run coefficients (shown in Table A1) were obtained. The results, written as an error correction model, are given in Table A2. The full model written out in levels, with all its lagged terms, is shown in Table A3.

The formal diagnostics around this equation seem satisfactory. The standard error is low (0.5 percent). There is neither significant serial correlation of the residuals nor heteroscedasticity (notwithstanding that the equation uses levels not logs). And, fitted up to the first quarter of 1997, it gives excellent forecasts of total private expenditure during the subsequent six quarters—when private expenditure was behaving in such a strange way (Table A4).

No claim is being made regarding any broad theoretical significance for this equation. In no fundamental sense can

Table A1

| Estimated Long Run Coefficients using the ARDL Approach | | | |
|--|-------------|----------------|---------------|
| ARDL(2, 1, 0, 0, 0, 0, 0) selected based on Schwarz Bayesian Criterion | | | |
| ***** | | | |
| Dependent variable is PXR | | | |
| 113 observations used for estimation from 1969Q2 to 1997Q2 | | | |
| ***** | | | |
| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
| YDR | .70610 | .048770 | 14.4780[.000] |
| DD1 | 1.0434 | .17809 | 5.8584[.000] |
| DD2 | .19396 | .077611 | 2.4992[.014] |
| DD3 | .31557 | .055472 | 5.6889[.000] |
| RPFA | 230.0381 | 35.3642 | 6.5048[.000] |
| RPH | 9.9135 | 1.7325 | 5.7221[.000] |
| CO | -672.5665 | 92.7038 | -7.2550[.000] |
| VR (-1) | .080823 | .023421 | 3.4509[.001] |
| ***** | | | |

Table A2

Error Correction Representation for the Selected ARDL Model
ARDL(2,1,0,0,0,0) selected based on Schwarz Bayesian Criterion

Dependent variable is dPXR
113 observations used for estimation from 1969Q2 to 1997Q2

| Regressor | Coefficient | Standard Error | T-Ratio(Prob) |
|-----------|-------------|----------------|----------------|
| dPXR1 | .22704 | .051476 | 4.4107[.000] |
| dYDR | .54410 | .054261 | 10.0274[.000] |
| ddd1 | .44503 | .073148 | 6.0840[.000] |
| ddd2 | .082732 | .033340 | 2.4815[.015] |
| ddd3 | .13460 | .028539 | 4.7166[.000] |
| dRPFA | 98.1202 | 15.3473 | 6.3933[.000] |
| dRPH | 4.2285 | .82000 | 5.1567[.000] |
| dCO | -286.8757 | 46.0978 | -6.2232[.000] |
| dVR(-1) | .034474 | .011109 | 3.1031[.002] |
| ecm(-1) | -.42654 | .041758 | -10.2146[.000] |

List of additional temporary variables created:

dPXR = PXR-PXR(-1)
dPXR1 = PXR(-1)-PXR(-2)
dYDR = YDR-YDR(-1)
ddd1 = DD1-DD1(-1)
ddd2 = DD2-DD2(-1)
ddd3 = DD3-DD3(-1)
dRPFA = RPFA-RPFA(-1)
dRPH = RPH-RPH(-1)
dCO = CO-CO(-1)
dVR(-1) = VR(-1) - VR(-2)
ecm = PXR -.70610*YDK -1.0434*DD1 -.19396*DD2 -.31557*DD3 -230.0381*R
PFA -9.9135*RPH + 672.5665*CO -.080823 *VR₁

| | | | |
|----------------------------|-----------|----------------------------|---------------|
| R-Squared | .81401 | R-Bar-Squared | .79578 |
| S.E. of Regression | 19.6165 | F-stat. F(9, 103) | 49.6032[.000] |
| Mean of Dependent Variable | 30.7577 | S.D. of Dependent Variable | 43.4082 |
| Residual Sum of Squares | 39250.2 | Equation Log-likelihood | -490.8834 |
| Akaike Info. Criterion | -501.8834 | Schwarz Bayesian Criterion | -516.8840 |
| DW-statistic | 2.2098 | | |

R-Squared and R-Bar-Squared measures refer to the dependent variable dPXR and in cases where the error correction model is highly restricted, these measures could become negative.

either lending flows or asset prices be treated or thought of as exogenous; and there is a high degree of simultaneity between many of the variables on both sides of the equation. The central point in the present context is that as the stock of liquid financial assets does not, as an empirical matter, fluctuate wildly and is not high relative to the flow of income, it is acceptable to bypass the specification of (several) consumption and investment functions as well as the labyrinthine inter-relationships between the household and

business sectors, for instance, the distribution of the national income between profits, proprietors' income and employment income, the retention of profits, and the provenance of finance for investment.

The equation is consistent with the view taken in this paper that aggregate private expenditure responds in a coherent way to aggregate income given various assumptions about the future course of asset prices and of net lending to the private sector—both of which may now be close to their cyclical peak.

Table A3

Autoregressive Distributed Lag Estimates
ARDL(2,1,0,0,0,0) selected based on Schwarz Bayesian Criterion

Dependent variable is PXR
113 observations used for estimation from 1969Q2 to 1997Q2

| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
|-----------|-------------|----------------|---------------|
| PXR(-1) | .80051 | .068115 | 11.7522[.000] |
| PXR(-2) | -.22704 | .051476 | -4.4107[.000] |
| YDR | .54410 | .054261 | 10.0274[.000] |
| YDR(-1) | -.24292 | .066562 | -3.6495[.000] |
| DD1 | .44503 | .073148 | 6.0840[.000] |
| DD2 | .082732 | .033340 | 2.4815[.015] |
| DD3 | .13460 | .028539 | 4.7166[.000] |
| RPFA | 98.1202 | 15.3473 | 6.3933[.000] |
| RPH | 4.2285 | .82000 | 5.1567[.000] |
| CO | -286.8757 | 46.0978 | -6.2232[.000] |
| VR(-1) | .034474 | .011109 | 3.1031[.002] |

| R-Squared | | R-Bar-Squared | |
|----------------------------|-----------|----------------------------|---------------|
| | .99962 | | .99959 |
| S.E. of Regression | 19.6165 | F-stat. F(10, 102) | 27169.5[.000] |
| Mean of Dependent Variable | 4110.1 | S.D. of Dependent Variable | 966.3492 |
| Residual Sum of Squares | 39250.2 | Equation Log-likelihood | -490.8834 |
| Akaike Info. Criterion | -501.8834 | Schwarz Bayesian Criterion | -516.8840 |
| DW-statistic | 2.2098 | | |

Diagnostic Tests

| Test Statistics | LM Version | F Version |
|--------------------------------|--------------|---------------------------|
| A:Serial Correlation*CHSQ(4)= | 4.7786[.311] | *F(4, 98)= 1.0818[.370] |
| B:Functional Form *CHSQ(1)= | .86880[.351] | *F(1, 101)= .78255[.378] |
| C:Normality *CHSQ(2)= | 2.0566[.358] | * Not applicable |
| D:Heteroscedasticity*CHSQ(1)= | 2.3784[.123] | *F(1, 111)= 2.3865[.125] |

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Table A4

Dynamic forecasts for the level of PXR

Based on 113 observations from 1969Q2 to 1997Q2.
ARDL(2,1,0,0,0,0) selected using Schwarz Bayesian Criterion.
Dependent variable in the ARDL model is PXR included with a lag of 2.
List of other regressors in the ARDL model:
YDR YDR(-1) DD1 DD2 DD3
RPFA RPH CO VR(-1)

| Observation | Actual | Prediction | Error |
|-------------|--------|------------|----------|
| 1997Q3 | 6157.3 | 6149.7 | 7.5873 |
| 1997Q4 | 6217.0 | 6217.5 | -.47760 |
| 1998Q1 | 6371.4 | 6335.0 | 36.3867 |
| 1998Q2 | 6432.5 | 6434.8 | -2.3231 |
| 1998Q3 | 6507.1 | 6523.2 | -16.0857 |

(Table continues)

Table A4 (Continued)

| Summary Statistics for Residuals and Forecast Errors | | |
|--|-------------------|------------------|
| | Estimation Period | Forecast Period |
| | 1969Q2 to 1997Q2 | 1997Q3 to 1998Q3 |
| Mean | .7999E-8 | 5.0175 |
| Mean Absolute | 15.4662 | 12.5721 |
| Mean Sum Squares | 347.3472 | 329.1871 |
| Root Mean Sum Squares | 18.6373 | 18.1435 |

Dynamic forecasts for the change in PXR

Based on 113 observations from 1969Q2 to 1997Q2.
 ARDL(2,1,0,0,0,0,0) selected using Schwarz Bayesian Criterion.
 Dependent variable in the ARDL model is PXR included with a lag of 2.
 List of other regressors in the ARDL model:

| YDR | YDR(-1) | DD1 | DD2 | DD3 |
|-------------|----------|------------|----------|-----|
| RPFA | RPH | CO | VR(-1) | |
| Observation | Actual | Prediction | Error | |
| 1997Q3 | 78.5513 | 70.9640 | 7.5873 | |
| 1997Q4 | 59.7202 | 67.7851 | -8.0649 | |
| 1998Q1 | 154.4126 | 117.5483 | 36.8643 | |
| 1998Q2 | 61.1089 | 99.8188 | -38.7099 | |
| 1998Q3 | 74.6196 | 88.3821 | -13.7625 | |

| Summary Statistics for Residuals and Forecast Errors | | |
|--|-------------------|------------------|
| | Estimation Period | Forecast Period |
| | 1969Q2 to 1997Q2 | 1997Q3 to 1998Q3 |
| Mean | .7999E-8 | -3.2171 |
| Mean Absolute | 15.4662 | 20.9978 |
| Mean Sum Squares | 347.3472 | 633.8902 |
| Root Mean Sum Squares | 18.6373 | 25.1772 |

Appendix 2. Note on the Models Employed

A "stripped down" quarterly stock/flow model of the U.S economy was used to derive alternative medium-term scenarios. For all its shortcomings, this model has the merit of consistency, the accounting being watertight in the sense that everything comes from somewhere and goes somewhere, while all financial balances have precise counterparts in changes in stock variables. Table A5 describes the accounting structure of the model and shows all variables measured at

current prices. All stock and most flow variables were also deflated to derive conventional measures of real income, expenditure, and output.

The model describes the processes by which the fiscal operations of the government, the net demand for exports, and the flow of private credit generate (*ex ante*) stocks and flows of financial assets for the private sector. The spending response of the private sector to its inherited asset stocks and its current flow receipts interacts with tax receipts, imports, and other cyclically sensitive variables to resolve the *ex ante* dispositions of all the three major sectors through the solution of a system of

Table A5 Flow Matrix Describing Flow Variables of "Stripped Down" Model of U.S. Economy

| Sector | Income/ expenditure | Production | Financial | General Government | Interest Pool | Foreign | Σ |
|--|---|------------|---|---|------------------|--|----------|
| Private expenditure | -PX | +PX | | | | | 0 |
| Government expenditure on goods | | +G | | -G | | | 0 |
| Government expenditure on services | | +LG | | -LG | | | 0 |
| Exports: agriculture | | +XAG | | | | -XAG | 0 |
| Exports: computers | | +XC | | | | -XC | 0 |
| Exports: other goods and services | | +XC | | | | -XC | 0 |
| Imports: oil | | -MO | | | | +MO | 0 |
| Imports: computers | | -MC | | | | +MC | 0 |
| Imports: other goods and services | | -MN | | | | +MN | 0 |
| Memo: gross domestic product | | [= GDP] | | | | | |
| Net indirect taxes | | -NIT | | +NIT | | | 0 |
| Total factor income | +YF | -YF | | | | | 0 |
| Unemployment benefit | +UB | | | -UB | | | 0 |
| Other government (domestic) transfers | +OTG | | | -OTG | | | 0 |
| Direct tax | -DTX | | | +DTX | | | 0 |
| Contributions | -EC | | | +EC | | | 0 |
| Private interest payments | +INTP | | | | -INTP | | 0 |
| Private transfers abroad | -trpf | | | | | +TRPF | 0 |
| Memo: private disposable income | YD | | | | | | |
| Government interest payments | | | | -INTG | +INT | | 0 |
| Factor income payments abroad | | | | | -YPF | +YPF | 0 |
| Factor income receipts from abroad | | | | | +YRF | -YRF | 0 |
| Government transfers abroad | | | | -TRGF | | +TRGF | 0 |
| Net lending to nonfinancial private sector | + ΔL | | - ΔL | | | | 0 |
| Sectoral financial balances = changes in asset or liability stocks | - ΔV change in liquid assets = cash flow surplus | | + ΔM = change in liabilities of financial sector | + ΔDG change in government debt = general government deficit | | + ΔVF net change in overseas assets = current balance of payments | 0 |
| Σ | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

(dynamic) simultaneous equations. This is all good old Keynesian stuff, except that careful track is kept of stock variables, which not only enter the expenditure function but generate flows of interest payments by the government as well as flows of factor income across the exchanges.

This model has only a limited application because it takes so much as exogenous, for instance, interest rates, exchange rates, asset prices, world commodity prices, the flow of net lending, and the rate of wage inflation. The main objective on the present occasion is to obtain a quantitative sense of the scale and duration of the

slowdown that will follow when the lending cycle turns down or if there were a downward adjustment of stock market prices. An equally important objective is to obtain a sense of the interdependence of the whole stock/flow system; it emphasizes, in particular, that the size of the budget surplus cannot be sensibly judged outside the context of what happens to the whole configuration of stocks and flows.

To the private expenditure function described in Appendix 1 were added conventional import and export price and volume equations and a simplified representation of the response of tax receipts and "entitlement" programs to the business cycle. This latter part of the exercise was carried out in a particularly crude way, using rules of thumb regarding elasticities of the fiscal system with regard to changes in real income and inflation, but it at least has the merit that it approximately reproduces the responses set out in the CBO's *Economic and Budget Outlook: Fiscal Years 2000–2009* (Congressional Budget Office 1999b).

The output of this model of the United States was used, in a process of successive approximation, in conjunction with a model of world trade and production. This world model, which was devised by Francis Cripps in (1979), divides the world exhaustively into eleven blocs (made up of one or more countries). At its heart there resides a matrix describing exports and imports of manufactures between each pair of blocs that is used to derive the share of each bloc's exports in the imports of every other bloc. Each bloc's supply of and demand for and also trade in energy and raw materials are also recorded, but not on a bilateral basis. The GDP of each bloc is determined by the sum of its domestic expenditure and balance of trade. Each bloc's domestic demand is determined by its real income (that is, real output adjusted for the terms of trade).

Imports into each bloc are determined by its output, using an imposed (but estimated) income elasticity of demand; total exports of manufactures from each bloc are determined by its (projected) share in each of the other ten bloc's imports. World demand for energy and raw materials is brought into equivalence with supply through market clearing processes which determine world prices both for energy and raw materials relative to that of manufactures.

The U.S. and the world models are both extremely transparent and easy to use. For instance, it is possible to enter a new assumption about the course of U.S. output exogenously into the world model and compare the results with a previous solution in about ten seconds. The solution of the world model itself, using a pentium laptop, takes about one second.

To generate the consistent results described in the main text, the two models were used in tandem. For instance, the more pessimistic projections of developments in the U.S. incorporate assumptions about world production (required to generate projections of U.S. exports) that have been modified, using the world model, by the implied fall in exports to the United States compared with what otherwise would have happened.

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Notes

1. Define G as government spending, T as tax receipts, and $\theta = T/Y$ as an average tax rate where Y is GDP. The fiscal ratio G/θ is exactly equal to Y when the budget is in balance ($G = T$). When the fiscal ratio exceeds GDP, there is a deficit ($G > T$); and when it is lower, there is a surplus ($G < T$). The fiscal ratio shown in the charts has been adjusted for the business cycle by correcting relevant components of G and T and adjusted for inflation by appropriate deflation of both stocks and flows.
2. The ATR is X/μ where X is exports of goods and services plus all transfers corrected for price changes and μ is the average import propensity corrected for the business cycle.
3. The CFTR is $(G + X)/(\theta + \mu)$, with everything adjusted for price changes as well as for the business cycle.
4. Because, to spell it out, if $G + X = T + M$, where M equals imports, and if $T + M = (\theta + \mu)Y$, it must also be the case that $Y = (X + M)/(\theta + \mu)$.
5. There are small exceptions to this of which the most important is probably imputed rent. The figures in Figure 7 have been purged of capital consumption by the government—a notional item that has recently been included in the NIPA to allow for the benefits derived from the publicly owned capital stock.
6. For a brief description of the model of world trade and production on which these projections are based and a list of the blocs into which the world is divided for the model, see pages 16 and 25.
7. The projections are almost identical to those made by Blecker (1999).
8. The same result could have been obtained by cutting taxes on a corresponding scale.
9. No official estimate of general government debt held by the public seems to exist. The

Organization for Economic Cooperation and Development (OECD) calculates and publishes its own estimate of general government debt, which is much higher than the one given here. Perhaps the OECD excludes stocks of debt arising from the Social Security surplus of state and local governments although it includes the corresponding surplus of the federal government. The OECD estimate seems inconsistent with the measured net flow of interest payments, implying impossibly low interest rates.

10. It has so far proven impossible to locate any measure of second-hand house prices before the first quarter of 1968.

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