

APPENDIX

FOMC NOTES - PRF
July 1-2, 1997

Mr. Chairman:

I will be referring to the three pages of color charts.

Since your last meeting, there has been a further unwinding of expectations for the Committee to raise rates. As you can see in the first panel, U.S. forward, three-month rates have shifted downward in recent weeks -- particularly following the data releases in early June.

Looking past all of the politics of European monetary union, German interest rate expectations have shown a very modest decline. While there are some indications that the German economy may pick up in the second half of the year, no one expects this to press on resources, nor to improve the German fiscal position appreciably, nor is there seen to be much -- if any -- risk of an increase in rates by the Bundesbank.

In Japan, as shown in the third panel, interest rate expectations have shifted up and down. Japanese forward rates were rising in May, significantly influenced by official pronouncements that the Japanese economy was stronger than the market thought and that the Bank of Japan would be raising rates sooner rather than later. But data releases in late May and early June did not support the heightened expectations created by the earlier open mouth operations and, once again, market participants perceived a postponement of any action by the Bank of Japan until closer to calendar-year end.

The market's first reaction to last week's release of the Bank of Japan's "Tankan" survey was to shift back to the stronger-sooner view. But looking past the headline index, and the exporters' continued strength, the soggy state of the non-manufacturing sectors suggested that the "self-sustaining forces of recovery" remain elusive.

Looking at this page as a whole, the narrow spreads between current and forward rates in all three markets are striking. In Germany the spread between current three-month deposit rates and those expected nine months forward is only 27 basis points, here in the United States it is 44 basis points, and in Japan: 62 basis points. Don and I frequently debate how to measure term premia in forward contracts: but, however measured, these are very tight.

Turning to the second page, even as Japanese interest rates declined a bit, shown in the top panel in the benchmark Japanese government bond, the yen has generally maintained its recent strength against a number of currencies, as you can see in the bottom panel.

The yen's continued strength, I think, is a function of the fears of the unhedged masses, resulting from the pain still lingering from the yen's sharp move in May.

For example, the two-year appreciation of the dollar against the yen induced Japanese exporters to lag their normal hedging of dollar receivables. But now, with a greater sense of two-way risk, the exporters are playing catch-up and, once again, their hedging activities weigh on the exchange market's consciousness.

Perhaps more importantly, I think we in the United States take too narrow a view of unhedged yen borrowings. By referring to this type of exposure as the "yen carry trade" we compartmentalize it as something limited to the sophisticated, leveraged strategies of hedge funds.

However, in the Asia-pacific economies, borrowing from Japanese banks is routine and unremarkable. While good data on unhedged yen liabilities is hard to come by, anecdotally it seems to be worthy of note.

One Asian central banker suggested a rather powerful analogy to me, by observing that the Japanese banks were doing in reverse sequence exactly what the U.S. banks did in the 1980s. U.S. banks first over-extended themselves lending to developing economies and, followed this up in the mid- and late 80s by overindulging in the U.S. real estate market. Japanese banks first over-extended themselves in Japanese real-estate lending in the late 1980's and have spent the last several years aggressively lending to (what we now call) emerging market economies, such as Thailand. Ignoring the obvious supervisory issues, this view helps me better understand why I am hearing as

much today about unhedged yen liabilities, with dollar-yen trading around 114, as I did two years ago when dollar-yen was trading below 100.

Turning to the third page of charts, the unwinding of expectations for any near-term rate increase by the Committee gave another shot of adrenaline to the rally in financial assets: here are but a few examples.

In the first panel, you can again see the impact of the data releases in early June, leading to the sharp narrowing of the spread between the Committee's Fed Funds target and the yield on the two-year note. Following the non-farm payroll and retail sales figures -- and reflecting, in part, the tight technical conditions in the short-end of the yield curve which I will come back to in a moment -- this spread was squeezed down to 50 basis points, before widening out a bit in the last few days.

In the second panel, as a proxy for the general rally in emerging market debt, spreads over comparable Treasuries of Latin American, stripped Brady bonds are shown. I think it is significant, if understandable, that these spreads narrowed so noticeably on the fact of the Committee's decision to leave rates unchanged at your May meeting, suggesting the importance of risk premia tied to the level of U.S. rates.

In the third panel, various equity indexes are graphed, re-indexed to April 15th for comparison. You can see that the spring rally got going after the release of the first quarter ECI and then simmered down a bit. Looking back, I am a lot more comfortable with the fact that the market rallied in late April on muted price data than I am with the more recent leg of the rally, which took off on the suggestion of weaker economic activity, seen in the softer-than-feared employment report on June 6th and retail sales release on June 12th.

U.S. equity markets pretty much peaked out the next day, with the June 13th release of May PPI (which is not indicated on the chart).

Yesterday's Wall Street Journal story about the "liquidity premia" being paid for the bluest of the blue chip stocks, because they will be "easier to sell", strikes me a potential leading indicator of liquidity illusions.

Turning to domestic operations, required operating balances fell to just under 15 and half billion, breaking the previous low set in January of 15.75 billion, reflecting the continued growth of sweep accounts. However, overall, the Fed Funds market has behaved reasonably well -- with predictable exceptions, such as yesterday when the funds rate traded above 6 percent for much of the day with the conjunction of the quarter-end and the settlement of the two- and five-year Treasury auctions. In general, it still appears to me that the funds market is adjusting to the gradual decline in required reserve levels. However, Don and I have circulated to the Committee a paper, prepared by Board and Desk staff, on measures which could be taken to address funds market volatility should it develop.

Just before your last meeting, we concluded a 5.1 billion dollar par amount coupon pass and, in the last two weeks, we completed a second consecutive coupon pass, in three legs, for a total of 4.7 billion par amount.

In maintaining the current 50-50 balance between Treasury bills and coupon securities in the System Open Market Account, I have been trying to follow a pattern of alternating bill and coupon passes. However, the bill market has become extremely tight, as described in Section III.B. of the Desk's written inter-meeting report, principally as a consequence of the Treasury's notable decrease in bill issuance. Instead of purchasing bills, and further contracting the limited supply in the secondary market, I elected to purchase coupon securities.

Treasury's decreased issuance of bills is noteworthy as an example of external constraints on the management of the SOMA. Last September when the Committee discussed the optimal structure and management of the SOMA, some members expressed a preference for increasing bill holdings. While we still owe the Committee further work on the principles and alternative portfolio structures which could guide SOMA's management, I did undertake to increase the Desk's flexibility by arranging with the Treasury for them to treat SOMA as an "add-on" in bill auctions, just as they do in coupon auctions, so that amounts we roll over would not be deducted from the Treasury's total offerings to the public.

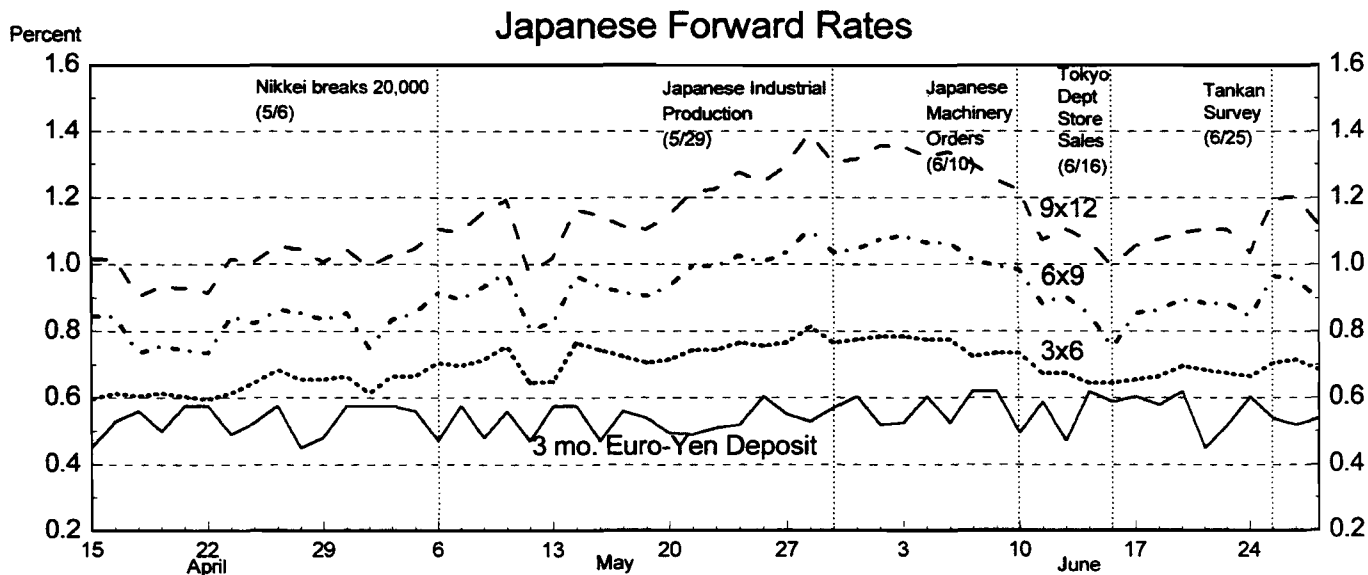
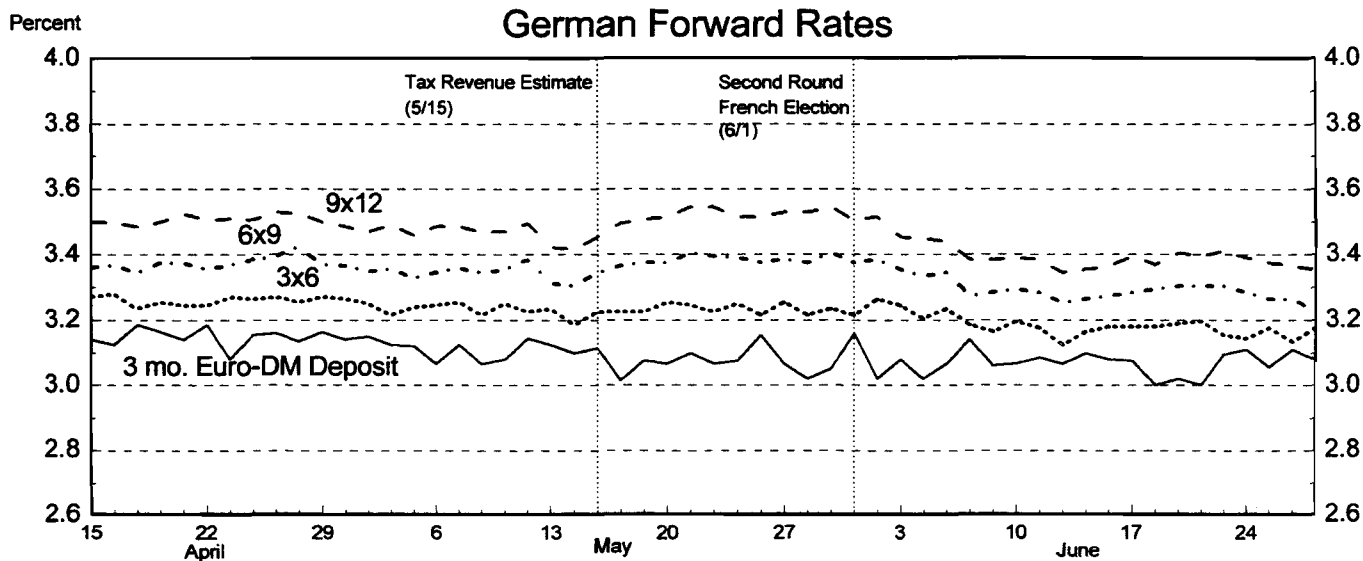
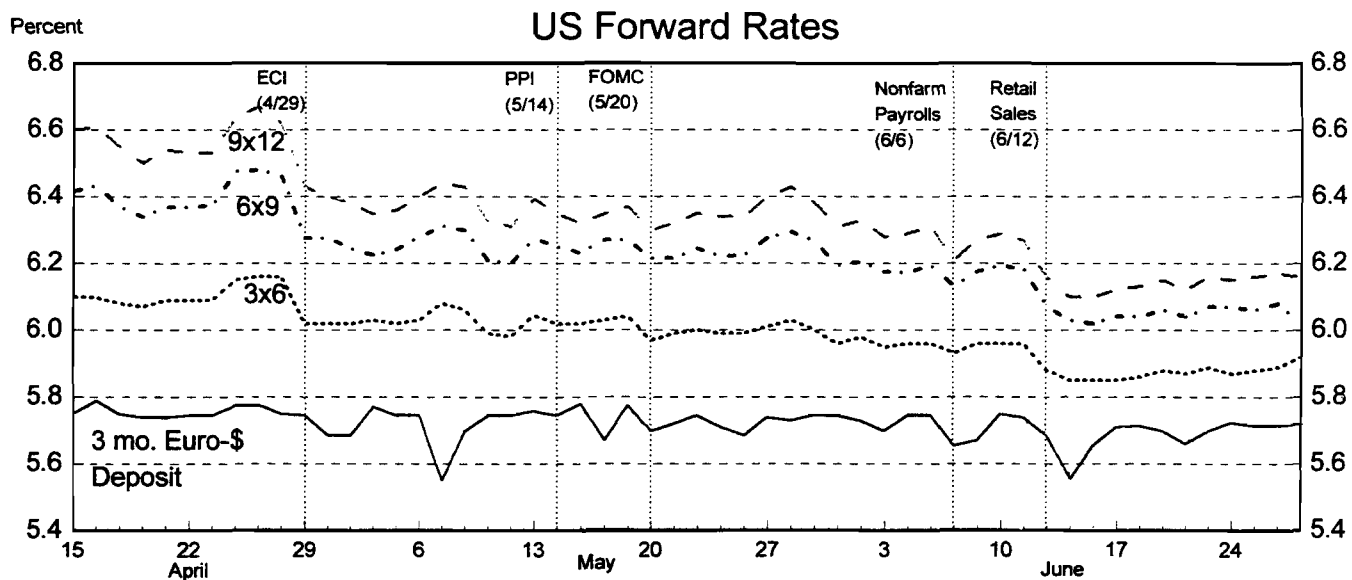
While formally the Treasury now treats our bill awards as an add-on, as a de facto matter, it still appears to me that their offerings to the public are affected by SOMA's rollovers and, thus, we continue to have an impact on bill supply in the market. I hope that, over time, the Treasury will become comfortable

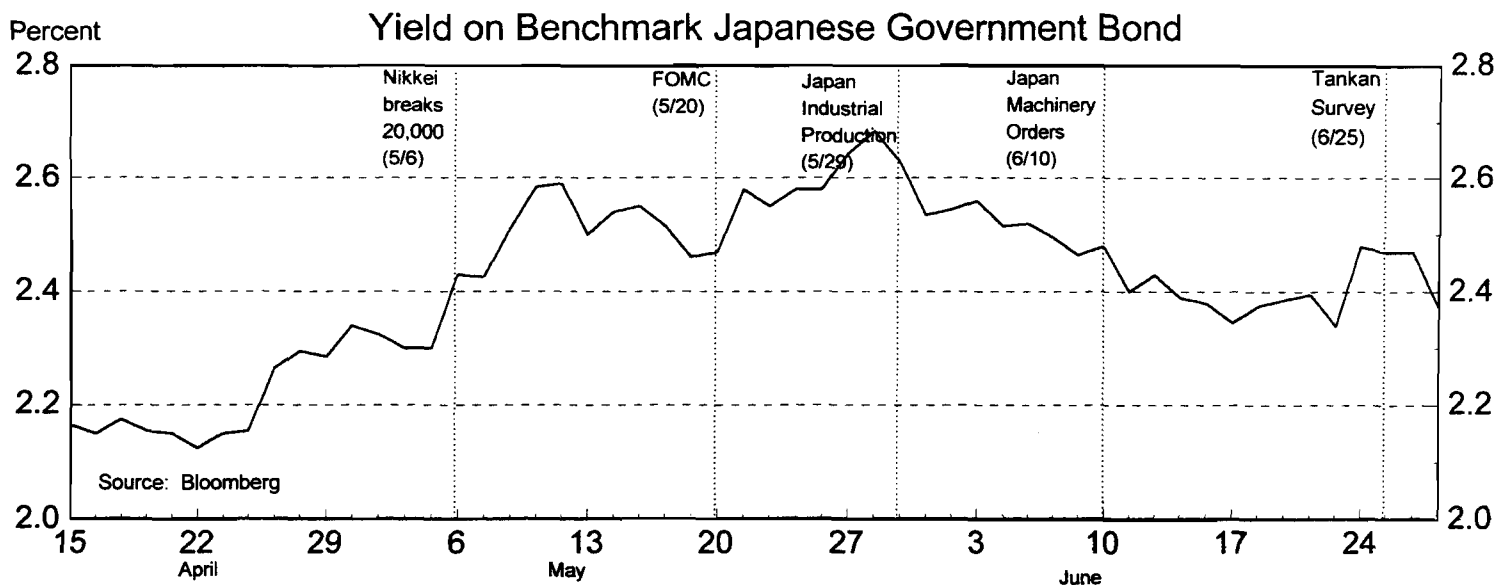
treating our bill holdings more flexibly and we will continue our dialogue. But, at least in the short run, unless we want to evaporate the bill market, I feel somewhat constrained from purchasing bills.

In general, I prefer the transparency of making SOMA purchase from the market and, thus, I have a preference not to purchase securities directly from foreign central banks when offered. More recently, I have also been conscious of the supply conditions in the bill market. However, on June 20th we did purchase just under 600 million dollars worth of bills from the Bank of Thailand, out of one billion they were seeking to sell. I was inspired to do this, in part, to avoid being seen selling a large quantity of bills in the market on the day the Thai finance ministry was changing hands. We also had a need to add reserves that day, which initially we thought would be around one billion, but we scaled back our purchase when our forecast need declined.

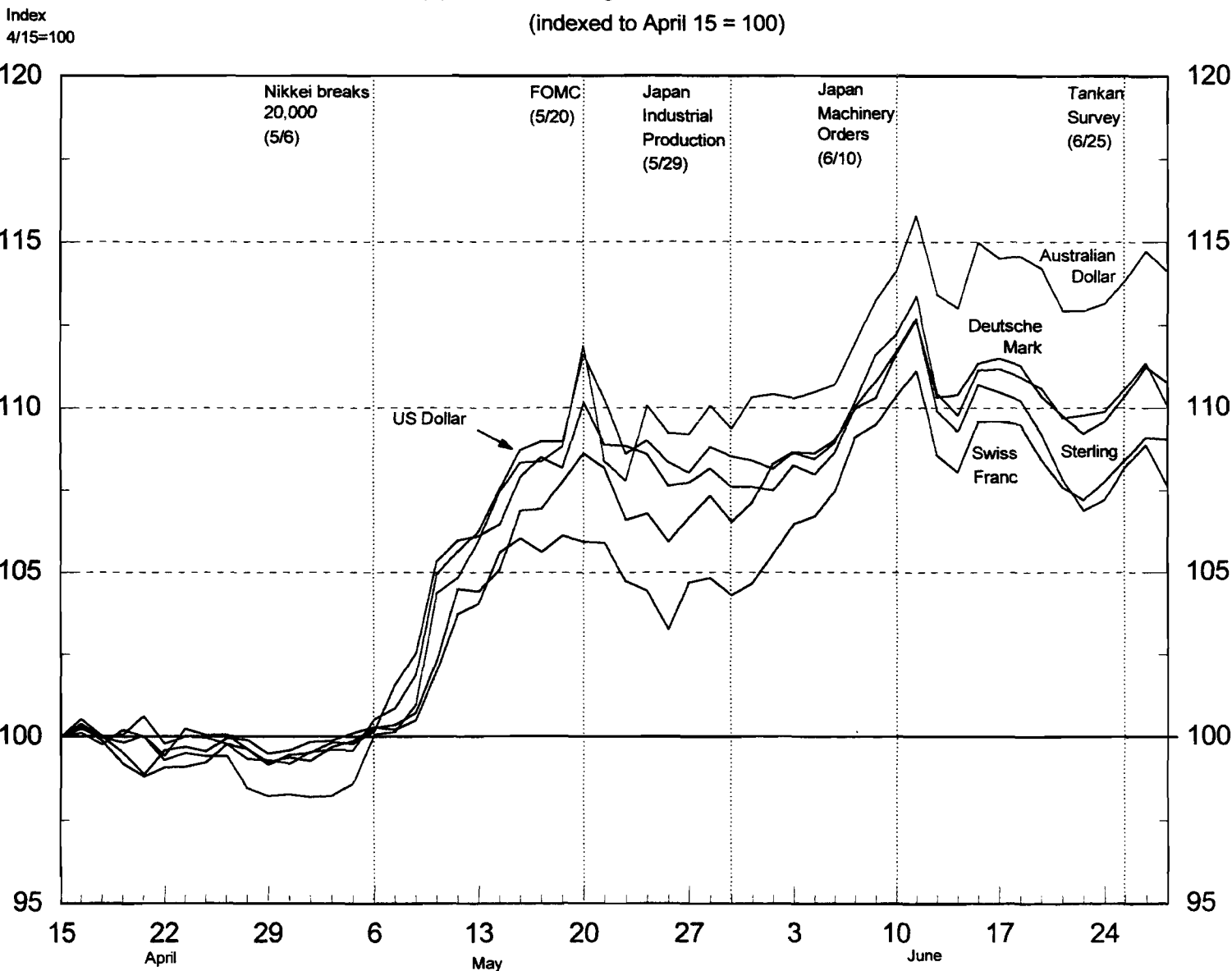
There were no foreign exchange intervention operations during the period.

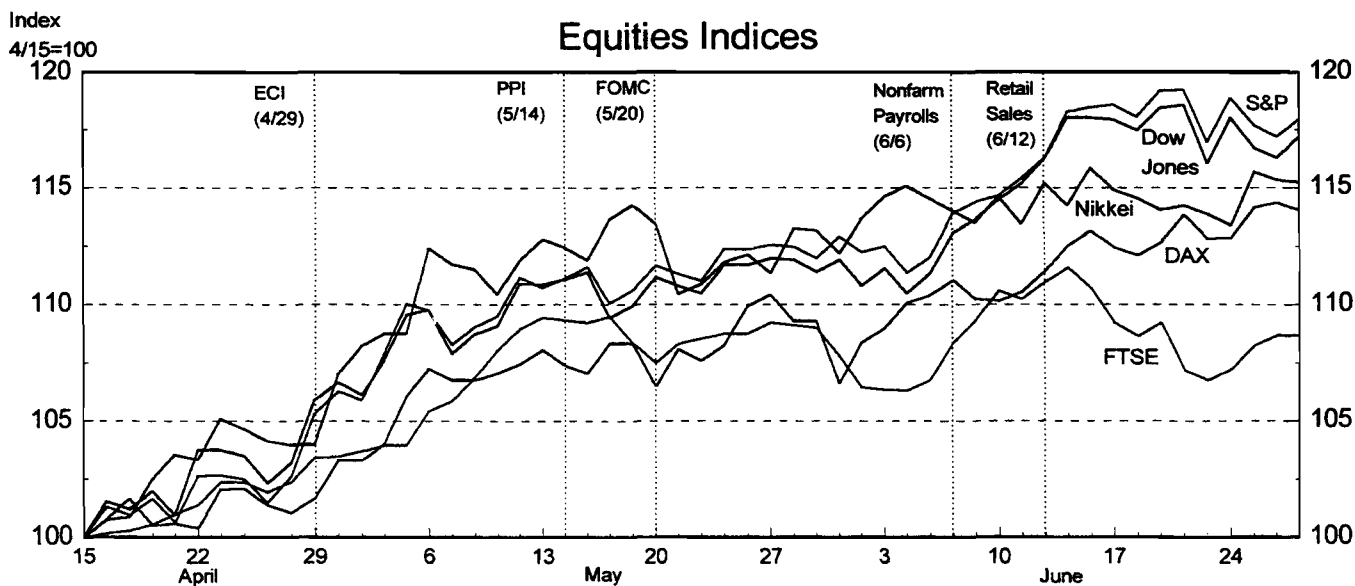
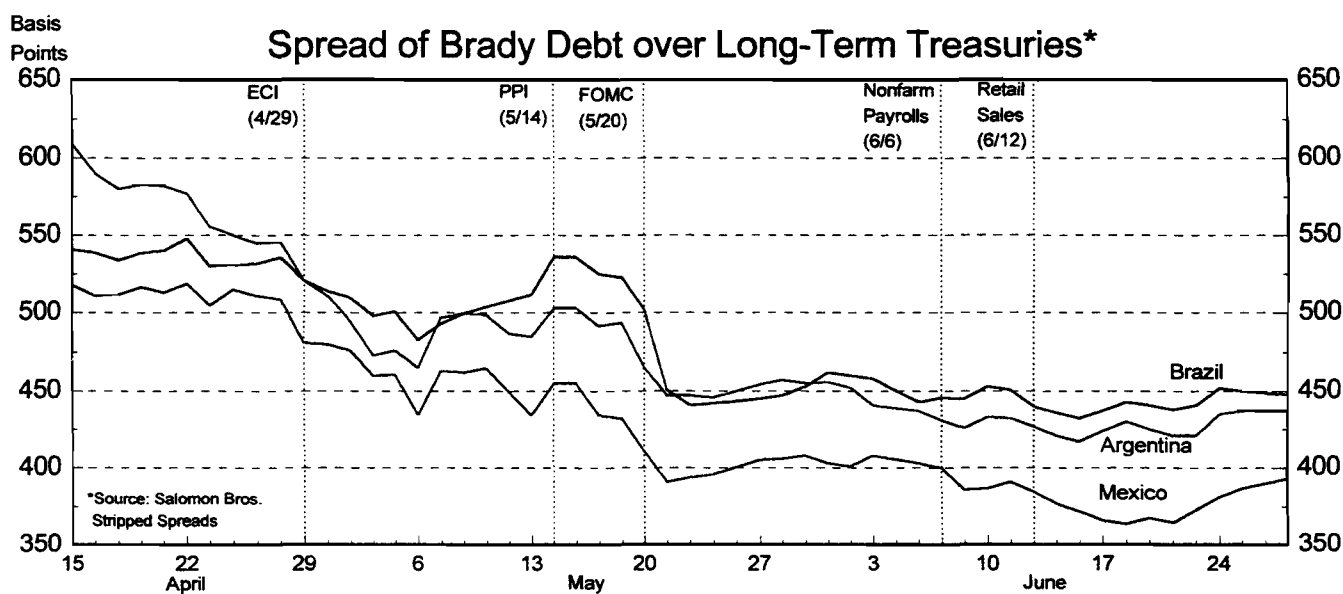
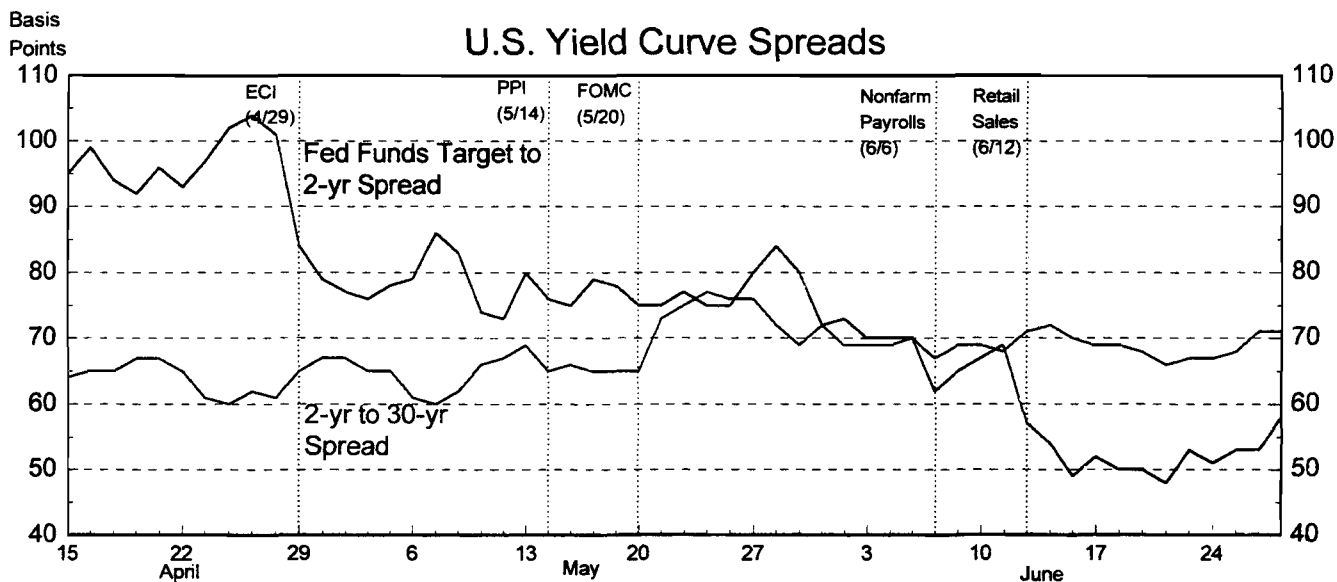
Mr. Chairman, I will need the Committee's ratification of the Desk's domestic operations and I would be happy to answer any questions.





Yen Appreciation Against Selected Currencies





Larry Slifman
FOMC Chart Show
July 1, 1997

As often seems to be the case, economic activity has been proceeding at an uneven pace in recent quarters, creating uncertainty about the "true" signal emanating from the data. Since the Greenbook was published we received more monthly information about spending in the second quarter: higher than expected consumption, but lower inventory investment and construction outlays. On balance, we would be inclined at this point to revise up our estimate of second-quarter GDP growth by about a quarter of a percentage point, to 2-1/2 percent. I should note that the charts show the forecast as published in the Greenbook.

Averaging through the first-quarter zig and the second-quarter zag, we think real GDP growth has been running in the neighborhood of a 4 percent annual rate so far this year. This clearly is an unsustainable pace, and we expect economic growth to slow gradually over the next year and a half. The basic rationale for the slowing was laid out for you in the Greenbook, and I won't go through the entire story. Suffice it to say that, in our view, a combination of waning stock demands for business and household investment goods and a moderate tightening of financial and credit conditions should damp aggregate demand.

We expect the unemployment rate to edge down during the remainder of this year. Next year, with output growing at around potential, the unemployment rate holds just above 4-1/2 percent--a degree of labor market resource utilization that we think is consistent with upward pressure on labor costs and, eventually, on prices. Indeed, as you can see from the

middle column of the data panel in the lower right, the CPI excluding food and energy is projected to accelerate three-tenths of a percentage point between this year and next.

For what it's worth, the latest Blue Chip consensus forecast is telling a story similar to the staff's for GDP over the next year and a half. However, the average Blue Chip forecaster seems to have a higher estimate of potential GDP growth--that is, the projected growth of GDP in the Blue Chip consensus is not sufficient to keep the unemployment rate from rising. The Greenbook and the Blue Chip consensus project essentially the same inflation rate for the four quarters of 1998--suggesting that we are considerably more optimistic about the likely near-term trade-off between unemployment and inflation.

As shown in the upper panel of chart 2, our forecast is predicated on the assumption that the federal funds rate will remain at its current level through this year. But, as inflation pressures begin to mount and real rates drop, we assume that the nominal fed funds rate will move up about 50 basis points. The expectation that monetary policy will hold steady in the near term has helped fuel a rally in bond markets since the last FOMC meeting. However, as labor market pressures continue to tighten and credit demands grow, we think bond traders will lose some of their enthusiasm, and yields will begin to rise later this year. Reflecting the assumed System tightening, long-term rates are projected to rise a bit further next year--averaging about 7-1/4 percent in the second half of 1998.

We anticipate that the stock market will climb a little further in the next few months. But we think corporate profits will prove disappointing over time, and coupled with higher interest rates, this will lead to an appreciable market correction in 1998--on the order of 15 to 20 percent.

On the fiscal policy front, the federal deficit is expected to widen a touch next year as the growth of receipts slows--primarily because we don't anticipate another outsized jump in revenues like the ones we saw in the past two years. In addition, the budget resolution raised the caps on discretionary spending and this should add about \$8 billion to nondefense outlays compared with the last Greenbook. But this is all pretty small stuff in the greater scheme of things, and as suggested by our measure of discretionary fiscal impetus, federal budget policy looks to be a virtually neutral element in the outlook for aggregate demand.

Ted will now discuss the prospects for the external sector.

E. M. Truman
July 1, 1997

FOMC Chart Show Presentation – International Developments

The first international chart summarizes the outlook for the external sector of the U.S. economy. The message depicted in the top panel has not changed fundamentally since January. We are projecting a continued deterioration of the current account balance; it will exceed \$200 billion and 2-1/2 percent of GDP in 1998. Our basic story has not changed either. Despite the positive influence on our exports of faster growth abroad, a "dollar [to quote a prominent Washington personality] that has been strong for some time now," U.S. growth that slows only gradually to around potential, and our existing deficit position produce a widening gap between imports and exports of goods and services; our deficit on net investment income expands as well.

As is shown in the middle left panel, the growth of real exports (black line) increased late last year and early this year in response to the recovery of foreign activity and the lagged effects of the weaker dollar in 1995. Export growth is expected to continue very strong through much of this year but to drop back in 1998 as the effects of the recent strength of the dollar are felt with greater force. Meanwhile, the growth of imports (red line) is expected to more than keep pace with that of exports; imports are being boosted this year by the rapid expansion in domestic demand and by the stronger dollar (which feeds through to imports more rapidly than to exports). Next year, import growth should ease off somewhat as the expansion of the U.S. economy slows toward potential and the influence of relative prices shifts toward neutral with the slight downward drift of the dollar. As is shown in the box at the right, real net exports of goods and services are projected to make negative contributions to the growth of real GDP throughout the projection period.

In the balance of my portion of our presentation I focus on the three issues listed at the bottom of the chart: our thinking about exchange rates, the foreign outlook and implications for

U.S. exports, and developments affecting prices and quantities of U.S. imports.

The next chart addresses the first of these issues. Based on the evidence of the past five months, the foreign exchange value of the dollar in terms of other G-10 currencies appears to have reached a high plateau. As is shown in the top left panel, the rise in the dollar since its trough in mid-1995 has been associated with a relative rise in U.S. real 10-year interest rates. Over the forecast period, we are projecting a slight downward drift in the dollar reflecting the net effect of the four influences on the dollar listed in the box at the right.

First, we think that our widening external deficit will put downward pressure on the dollar, though we are far from confident about timing or magnitude.

Second, more rapid inflation in the United States than in other G-10 countries also will tend to depress the dollar in nominal terms (the red line at the left), but it will translate into a smaller depreciation on a price-adjusted basis (the black line) because of higher U.S. inflation than in other G-10 countries; put another way, in the absence of the dollar's projected nominal depreciation, it would appreciate in real terms and further weaken our external position.

Third, the differential in real long-term interest rates (the blue line) is expected to have a neutral effect on the dollar. We have a very slight upward tilt in the path of real long-term interest rates in foreign G-10 countries. The slight wiggles in the differential reflect primarily the projected path of U.S. long-term interest rates.

The middle left panel illustrates, for three representative countries, how three-month rates are expected to creep up in response to their strengthening expansions. In Canada, increases in interest rates continue to keep pace with increases in U.S. interest rates. In Japan, as the expansion matures, we are assuming that interest rates will begin a gradual rise from the abnormally low level that has prevailed for almost two years. In Germany, we are assuming that short-term rates will rise about 75 basis points in the run-up to the start of EMU. However, under this scenario, German real and

nominal short-term interest rates still will be well below their average of the past several decades when monetary policy is handed over by the Bundesbank to the European Central Bank -- a point to which I will return in a moment.

This brings me to the fourth influence on the dollar, European Monetary Union. We are now assuming that a broadly based EMU will start on January 1, 1999, with the initial participation of 11 of the current 15 members of the European Union. Italy, Spain and Portugal will be in; Denmark, Greece, Sweden and the United Kingdom will be out, or stay out. The Maastricht treaty reference values for 1997 fiscal deficits will be missed or fudged by most major participants. In the run-up to EMU, at least, these factors plus an increase in general uncertainty will tend to continue placing downward pressure on the EMU currencies relative to the dollar, everything else being equal.

Pulling all these influences together, we are projecting, as you can see in the middle-right panel, that the dollar will remain essentially unchanged against the DM over the projection period -- the negative influence on the dollar of our widening external deficits is outweighed by the positive influence, so to speak, of EMU. The dollar depreciates substantially against the yen by the fourth quarter of 1998; in this case, the influence of external balances -- including importantly the rising Japanese surplus -- predominate. Finally, the U.S. dollar is projected to depreciate moderately against the Canadian dollar.

To complete our exchange rate story, the bottom panels look at non-G-10 currencies. The black and blue lines show that in real terms the G-18 index tends to track movements in the G-10 index. For the eight non-G-10 currencies -- two Latin American and six Asian -- the trend of the dollar has been one of gradual real depreciation, a trend that we expect to continue on balance. This trend principally has been associated with the fact that inflation in these countries has been somewhat more rapid than in the United States while most of their nominal exchange rates are closely tied to the dollar. A partial exception to this generalization -- the Mexican peso -- is shown at the right. Since

the dollar's substantial real appreciation against the peso in early 1995, it has retraced a good portion of the rise because the large differential between Mexican and U.S. inflation has outweighed the dollar's moderate further nominal appreciation against the peso. However, we are not projecting a continuation of this pattern. As indicated, the real peso/dollar exchange rate is expected to remain essentially unchanged over the next 18 months, as the dollar's nominal appreciation keeps pace with the inflation differential.

Turning to the foreign outlook, the subject of Chart 5, the top left panel illustrates the recovery since late 1995 in growth in both foreign G-7 countries and developing countries. As is shown in the box at the right, we are projecting fairly strong growth in Japan and Canada this year and next, while growth in the United Kingdom is projected to slow in 1998 under the influence of tightening monetary policy. Meanwhile, growth in our presumptive 11-country "Euro Area" is projected to average about 2-3/4 percent, somewhat faster than our estimate of their potential growth on average.

With respect to the developing countries, we expect a slowing of growth in Mexico and the rest of Latin America following very strong performances last year; indeed, a slowdown in the first part of this year already is evident. We also are projecting a modest slowing in growth (on average) in developing countries in Other Asia. So far this year, lower growth has been recorded in Korea and Taiwan. There is a larger than normal downside risk to our forecast for this region given the uncertainties associated with the influence of the yen on their exports, weaknesses in some domestic financial systems, potential spillovers from Thailand's problems, and the transfer earlier today (their yesterday) of sovereignty over Hong Kong.

As shown in the middle left panel, consumer price inflation abroad is projected to be low, or in Mexico's case declining.

The box at the right provides a perspective on output gaps in the foreign industrial economies.

As you can see, we estimate that the Japanese output gap will be reduced substantially by the end of the forecast period; this reflects our assumption that growth of potential output in Japan is about 2 percent and our projection that actual Japanese growth will average about 2-1/2 percent over the forecast period. Canada's output gap is projected to narrow more rapidly, but to remain somewhat larger than Japan's at the end of the period.

In the case of the United Kingdom, our estimate of the level of potential output may well be conservative in view of last Friday's substantial upward revision in the level of actual output. The new data on actual output and our previous estimate of potential output suggest that the British output gap already was more than eliminated by the end of 1996. However, our new estimates of potential and the output gap, displayed in the box, imply that some slack remained at the end of last year; this result at least makes the favorable recent U.K. price performance a bit more plausible.

The Euro Area presents an interesting case in the context of the start of EMU. We estimate that the output gap for the area as a whole still will be substantial -- more than a percentage point -- when the European Central Bank opens its doors in early 1999. However, our judgment is that there will be relatively little slack in Germany. At the same time there will be a larger amount in France, and output in Italy and Spain (not shown) will be significantly below potential. Taking our estimates at face value, one can speculate about two questions: Will the Bundesbank endeavor to put in place a less accommodative stance of monetary policy than we have assumed before it hands over the reins of monetary policy to the European Central Bank? In setting policy during 1999, how much weight will the ECB give to conditions in Germany versus other countries? We will not fully confront the implications of these issues for our forecast until we extend it into 1999, but they are some of the uncertainties that will weigh on the euro in the period ahead.

Turning to our forecast for U.S. exports, the solid black bars in the bottom panel show that we are projecting the continuation of a healthy expansion of total exports of goods and services both this

year and next. The other bars show the contributions of various categories of exports to the growth of the total. In recent years, the major contributions have come from exports of computers and semiconductors (the black, cross-hatched bars) and exports of other goods (the open red bars). In 1996 and so far in 1997, exports of other goods increased substantially more than our model's prediction. This suggests a source of risk to our forecast; we chose a middle road and implicitly assumed that the growth of these exports reverts to the historical rate. We have not assumed a reversal in the positive surprise -- about half of which is attributable to a higher rate of aircraft shipments than we expect to be sustained. In 1998, given the additional negative lagged effects of the recent strength of the dollar, the contribution of other goods exports to the growth of the total shrinks dramatically; exports of computers and semiconductors more than account for the overall growth we are projecting.

The final international chart deals with U.S. imports, both prices and quantities. With respect to prices, the heavy red line in the top left panel shows that prices of total manufactured imports have been on a declining trend since the second half of 1995, led by declines in prices of imports from Japan and the NIEs as well as from Canada and, more recently, the European Union. As indicated by the red line in the right panel, import prices have declined over the past year or so. As shown by the bars, the estimated contribution of exchange rates to that decline has been considerable. Declining import prices, in turn, have tended to hold down overall U.S. inflation by a few tenths in recent quarters. This favorable influence of the dollar, through import prices, on U.S. inflation is projected to be eliminated, if not reversed, over the period ahead.

The red lines in the middle panels depict actual and projected growth in quantities of goods imports -- excluding oil, computers and semiconductors. The contribution of relative prices (on the left) is to boost the growth of imports somewhat this year, but they become a neutral factor by the end of next year. The predominant influence (shown at the right) is the pace of expansion of U.S. GDP.

The bottom panel presents another cut on recent and projected trends in the pattern of overall growth of imports of goods and services. As in the case of exports, growth in the total (the solid black bars) is dominated by computers and semiconductors (the black, cross-hatched bars) and by other goods (the open red bars). The contributions to growth of the total from imports of services and oil are relatively minor. As U.S. GDP growth slows in 1998, the contribution of imports of computers and semiconductors to the growth of the total will remain high in absolute terms and rise in relative terms. The contribution of imports of other goods shrinks.

Larry Slifman will now continue our presentation.

As always, a key element in our GDP forecast is the consumer sector--the subject of chart 7. The upper left panel, presents the outlook for sales of light motor vehicles. Our projection, as well as those of many industry analysts, puts the "fundamental" demand for light vehicles--based on demographic and scrappage trends--at about 14-1/2 to 14-3/4 million units per year. Sales this year are likely to once again exceed the underlying trend, reflecting, in part, the strength of income and consumer sentiment. But sales are expected to move down toward the trend during 1998, and motor vehicles, therefore, have a slightly negative influence on GDP growth next year.

As noted in the Greenbook, we think that the current "pause" in consumer spending outside of the motor vehicle sector is just that--a pause, and not the beginning of a protracted slump. As I noted earlier, the monthly PCE data for May that we received yesterday came in stronger than expected and have led us to revise up our forecast of second-quarter consumer spending by about three-fourths of a percentage point. Moreover, as suggested by the forecast bar for 1997 in the upper right panel, consumer spending for goods and services other than motor vehicles is expected to continue rising at a fairly rapid clip during the next several months, bringing the four-quarter growth rate to more than 3-1/2 percent.

Our bullish near-term PCE forecast relies, in part, on consumer sentiment. As may be seen in the lower panels, both the overall Michigan sentiment index and the question on unemployment expectations, which is

not part of the aggregate index, suggest that consumers are extremely upbeat currently.

Returning to the upper right panel, consumer spending slows over the course of 1998 as the pace of hiring moderates and income growth tapers off. Spending may also be damped next year if lenders tighten credit terms and standards, as they've already been doing on a limited basis--especially for credit cards. Finally, there is the question of our stock market forecast and how we see it affecting consumer spending. That is the subject of your next chart.

Share prices have risen roughly 90 percent since the end of 1994, producing a substantial increase in price-earnings ratios. The p-e chart shown here updates the one Mike presented to you in February. After adjusting for special charges for restructuring, shown by the red line in the upper panel, the current p-e is at its highest level since the early seventies. The vertical lines denote troughs in the earnings cycle for S&P 500 stocks. You can see that peak p-e ratios typically have occurred near a trough in earnings. Well we're far from that: profits have been soaring in recent years. And yet, analysts expect even faster profit growth for the next three to five years--the middle left panel.

If, instead, profits flatten out as we are projecting, the analysts and other market participants will be disappointed. And, as I indicated earlier, in our forecast this--along with the updrift in interest rates--leads to a considerable price retreat next year.

In terms of our consumption forecast, the ups and downs of the stock market are expected to have a muted effect. The lower panel compares the wealth-income ratio (the blue line) with the consumption rate--that is, one hundred minus the saving rate. The chart suggests that consumption growth since early 1995 has been considerably less than would have been expected on the basis of this simple wealth-spending relationship. Of course, the opposite problem existed earlier in the nineties. Future revisions to the national income accounts could possibly alter this picture, but for now it's our assumption that in recent years other factors have been offsetting the influence of the wealth effect. Previous Greenbooks have discussed some of the possible explanations: strong income growth that has not yet been fully incorporated into perceptions of permanent income; increased debt-service burdens, especially among households with below-average incomes; and perhaps an increased desire to save for retirement, especially given the attention in the media to the problems of the social security and Medicare systems. In any event, our assumed stock market correction in 1998 reverses this year's sharp rise in the wealth-income ratio, which may begin cutting into spending by year end.

Your next chart examines the other key source of deceleration in GDP growth next year: a slowing of business spending for equipment. As may be seen in the upper panel, investment in producers' durable equipment this year is growing at an even more remarkable rate than the outsized pace recorded in 1996--fuel by continued rapid spending for computers, a surge

in aircraft deliveries, and a revival of outlays for other capital goods after a period of dormancy. However, all three components of PDE are expected to grow more slowly in 1998.

The middle left panel presents actual and expected unit shipments of PCs. The data are collected by the Information Technology Industry Council, a trade association representing the leading US PC and microprocessor manufacturers. As you can see, the industry expects shipments to cool a bit this year and next. Nevertheless, they still are forecasting gains of more than 15 percent per year. Recognizing the performance improvements in these boxes, unit PC sales underestimate by perhaps 10 percentage points or more the growth of real computer investment as reported in the national income accounts. If anything, then, our forecast of an 18-1/2 percent rise in real outlays next year may be on the low side.

Meanwhile, Boeing continues to ramp up its production. By the end of this year, Boeing expects to be completing 40 planes per month--about twice the pace recorded late last year. Under current schedules, the delivery rate levels off in 1998 and the impetus to GDP growth from this sector slackens.

Orders for nondefense capital goods other than computers and aircraft--the lower left panel--revived earlier this year and have remained near their record levels. This suggests strong investment in the next several

months. But investment demand is projected to soften thereafter as output decelerates and cash-flow flattens.

In contrast to the marked deceleration we are forecasting for equipment, the growth in outlays for nonresidential structures is expected to be maintained at close to the current rate. Contracts for private nonresidential buildings are at high levels; vacancy rates for office space have declined steadily; rents are rising; and REIT financing is readily available.

As shown in the upper panel of exhibit 10, the strong investment in computers has been associated with a pickup in the growth of the capital stock for information processing equipment. In addition, the growth of the stock of other kinds of business equipment--the middle panel--rose in the mid-1990s and has remained elevated compared with the 1980s and early nineties. Accordingly, the lower panel illustrates that the average growth of aggregate capital input for equipment and structures relative to the growth of labor--that is, capital deepening--has been running a bit faster in recent years than in the preceding decade. But this relatively small stepup is not enough, by itself, to significantly boost our assessment of trend productivity growth. And, as Dave Stockton will now discuss, we still see no compelling evidence that there has been an improvement in the growth of potential GDP recently.

DStockton
Chart show
7/1//1997

As shown in the upper panel of your next chart, we're projecting that the growth in potential output over the next year and a half will remain at the 1.9 percent annual pace that we estimate has prevailed since the cyclical peak in 1990. That projection is composed of nearly equal contributions from the growth of labor input--line 2--and the growth of productivity--line 3.

Taken at face value, the published figures for productivity in the nonfarm business sector point to a sharper slowdown in productivity since 1990 than we have assumed--perhaps to about 3/4 percentage point per year. However, as we have noted previously in the Greenbook, we are anticipating that real output and, hence productivity, will be revised up in this summer's annual revisions to the national income accounts by enough to support our 0.9 percent estimated trend--plotted in red in the middle panel. But in the absence of any clear signs in the data of an increased pace of efficiency gains or a greater pick up in capital deepening, we have been reluctant to project a still higher trend going forward.

The acceleration in economic activity over the past year likely has provided a boost to output per hour. However, next year, we anticipate that productivity will rise a bit more slowly--gradually approaching its longer-term trend--as activity decelerates and firms reach deeper into the diminishing pool of qualified workers.

Abundant job opportunities have been drawing people into the labor force at a rapid clip over the past year. The labor force participation rate--shown in the lower left panel--moved above 67 percent in recent months, up about 1/2 percentage point from a

year ago. And in the context of our projection of some further tightening of labor markets, we anticipate that the participation rate will continue to edge up over the next six quarters.

As shown at the right, the resulting labor force growth is expected to remain above its 1 percent trend over the projection period. Even so, the projected strength of economic activity this year and smaller productivity gains in 1998 cause employment growth--the second column--to outstrip the expansion of the labor force over the forecast period.

As a consequence, the unemployment rate--shown in the upper left panel of chart 12-- falls to close to 4-1/2 percent by early next year. Other indicators of labor market conditions are showing similar signs of tautness. For example, in the Conference Board survey--the upper right panel--the number of households reporting that jobs are plentiful exceed by a wide margin those reporting that jobs are hard to get. In addition, the help we've been getting from decelerating health insurance costs may be coming to an end. The results of a Peat Marwick survey of large firms are presented in the middle left panel. These firms report larger increases in health insurance premiums in 1997 than in 1996. Although these increases are small and could be offset by lower wage gains, health care costs are unlikely to be as favorable an influence going forward as they have been in the recent past.

In our view, these factors already have left some imprint on compensation inflation--plotted as the black line in the lower panel. And with the unemployment rate projected to move still lower, a further mild acceleration is expected over the next year and a half. That this process has not gained any perceptible momentum likely reflects the

fact that, while tightness in labor markets may be boosting hourly compensation costs a bit more quickly, we have yet to witness any increase in inflation expectations--a necessary ingredient of a conventional wage-price spiral. Indeed, the Michigan survey of inflation expectations--shown in the middle right panel--has basically been moving sideways for some time now.

To a large extent, developments in product markets appear, thus far, to have short circuited this feedback mechanism. Two key factors, declining non-oil import prices and ample manufacturing plant capacity, are highlighted in the upper panels of your next exhibit. As shown in the left hand panel, non-oil import prices dropped 3 percent last year and appear to have declined at a similar pace over the first half of this year. For the reasons that Ted discussed earlier, we are expecting these declines to give way to increases later this year and into the next, weakening one of the factors that has suppressed price inflation over the past year and half.

Another favorable influence has been healthy growth of capacity, which has kept the factory utilization rate close to its historical average, and by our assessment, a largely neutral influence on price pressures in the goods sector. Moreover, we are anticipating that utilization rates will edge down over the projection interval, as manufacturing investment plans are only gradually scaled back in response to the weakening of sales, profits, and cash flow that we have projected for this sector.

Owing to these restraining influences, the cyclically adjusted markup of prices over unit labor costs in the nonfarm business sector--plotted in the middle panel--is expected to drift down somewhat over the forecast period. As a consequence, we are projecting only

a very modest upturn in broad measures of price inflation--shown in the lower panels. GDP prices--the black line--are projected to pick up from a 2 percent increase in 1996 to a 2-1/4 percent increase this year and 2-1/2 percent increase next year. The sharp slowing in food and energy prices under way this year, which receives a much larger weight in PCE prices--the red line--results in lower consumption price inflation this year before moving up to a 2-1/2 percent pace in 1998.

Obviously, there are considerable risks that lie on both sides of our inflation projection. One risk is that current and prospective labor market tightness will leave a clearer mark on the inflation process going forward than has been apparent over the past year. And, if the price news turns less favorable, the feedback into inflation expectations and labor costs could be more abrupt.

Another risk, which has received considerable attention, is the possibility that fundamental changes are taking place in the economy that have raised underlying productivity growth and restrained inflation. The implications of such an acceleration in productivity are the subject of your next two charts. In the upper panel of chart 14, I have plotted productivity in the nonfinancial corporate sector of the economy. This sector covers a bit more than half of GDP and may be less susceptible to measurement error than the financial and non-corporate sectors of the economy. Much like the broader nonfarm business measure I showed in chart 11, there are no clear-cut signs that the trend in productivity of this sector has improved. But over the past two years--a period I have highlighted in red on the chart--productivity has increased at nearly a 3 percent annual rate, well above its 1-1/2 percent historical trend--the black dashed line.

If one wished to take an optimistic slant, such an upturn could be viewed as hinting at an improving productivity performance.

You, of course, are quite familiar with the suspects in this story--rapid investment in new technologies, the payoff from corporate restructurings, and the imperative to innovate in response to an increasingly competitive world economy. I would note one additional possibility--low and stable inflation. If some acceleration of productivity is under way, the reduction in inflation and inflation uncertainty in recent years may have played an important supporting role.

The lower panel of the exhibit outlines the effects that a step-up in the productivity growth trend would have on both the supply and demand sides of the economy. On the supply side, an increase in the pace of productivity growth will initially raise business profitability by enabling firms to produce more with less. However, competitive pressures soon would emerge that force down price inflation to better reflect the slower growth in the costs of production. In labor markets, real wages rise more rapidly through some combination of lower price inflation and larger nominal wage gains.

On the demand side of the economy, technological improvements boost business investment, as firms seek to take advantage of profitable opportunities. Households also raise spending as more rapid growth in both capital and labor income lead to upward revisions in their estimate of trend--or so-called permanent--income. Needless to say, there are similarities between these supply- and demand-side effects and some recent economic developments.

In your next chart, I present simulations of our econometric model that lay out the effects on some key economic variables of a permanent increase in productivity growth of 1/2 percentage point per year starting in 1997. For this exercise, I have considered two alternative policy responses, which illustrate some of the tradeoffs you would face under these circumstances. In one case, I assume that monetary policy stabilizes the unemployment rate at its baseline path, thus allowing the effects of the higher productivity growth to show through into permanently lower inflation. The second case assumes that policy attempts to stabilize the long-run inflation rate and allows the unemployment rate to fall temporarily. These alternatives are shown as deviations from baseline in the upper four panels, with the inflation targeting case shown in red and the unemployment targeting case shown in blue. In the lower table, I show the extended Greenbook forecast and the consequences of more rapid productivity growth for inflation and unemployment under the two alternative policy responses.

As you can see in the upper left hand panel, an unanticipated increase in the rate of productivity growth of 1/2 percentage point per year initially results in a reduction in price inflation under either policy. In the inflation-targeting case, the nominal funds rate--the red line in the middle left panel--is unchanged until 1999. During this period, both inflation and the unemployment rate--the red lines in the upper two panels--move lower. The boom in demand drives up output and reduces the unemployment rate. But, for a while, productivity gains offset the cost pressures associated with larger wage gains and, consequently, price inflation declines. In effect, the acceleration in productivity creates a transitory drop in the NAIRU. By 1999, however, price inflation moves back up toward

baseline as labor costs are boosted, in part, by tight labor markets. In addition, the larger real wage demands that follow the more rapidly rising productivity effectively reverse the decline in the NAIRU and further boost labor cost increases. In fact, to prevent inflation from moving above baseline, the nominal federal funds rate must be raised by about 3/4 percentage point between 1999 and 2001.

In the second case, to stabilize the unemployment rate--the blue line in the four panels--the nominal federal funds rate is raised immediately to lean against the emerging strength of aggregate demand. Taken together, the increase in nominal rates and the decline in price inflation result in a more rapid rise in the real interest rate--the blue line in the middle right panel--than occurs in the inflation-targeting case. Under these circumstances, the improvement in productivity shows through to a permanently lower rate of price inflation--the upper left panel--by about the 1/2 percentage point increase in the growth of productivity.

In the end, the policy choice comes down to a tradeoff between, on the one hand, permanently lower inflation and, on the other hand, unchanged inflation but an extended--if temporary--period of lower unemployment. Clearly, supply shocks--good ones as well as bad ones--confront policymakers with some difficult decisions. However, if we are fortunate enough to be facing this situation, your choices will be between some very attractive outcomes.

The final chart in our presentation displays your forecasts for 1997 and 1998. As shown in the upper panel, you have revised up your estimates of real GDP growth for this year and, correspondingly, revised down your estimates of the level of the unemployment

rate in the fourth quarter of this year. At the same time, however, you have revised down your CPI projections for 1997. As shown in the lower panel, for 1998, you anticipate a considerable slowing in the growth of real GDP; the unemployment rate is expected to hold steady; and CPI inflation is projected to edge up.

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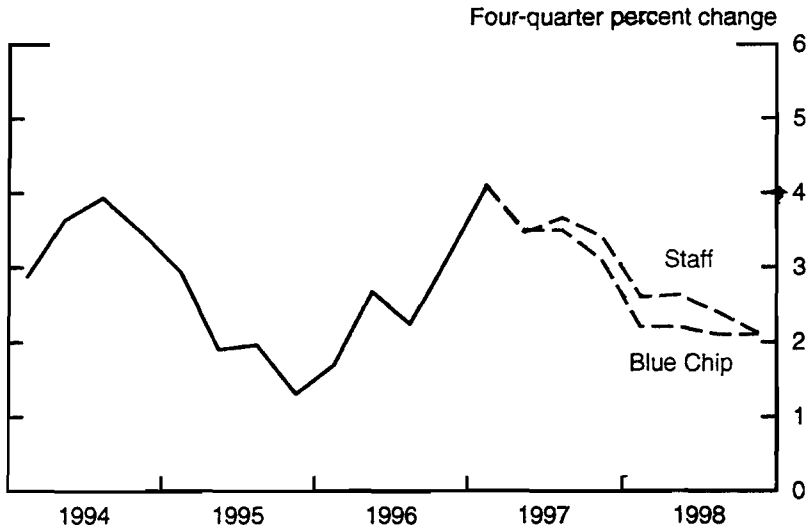
Material for
Staff Presentation to the
Federal Open Market Committee

July 1, 1997

Chart 1

Forecast Summary

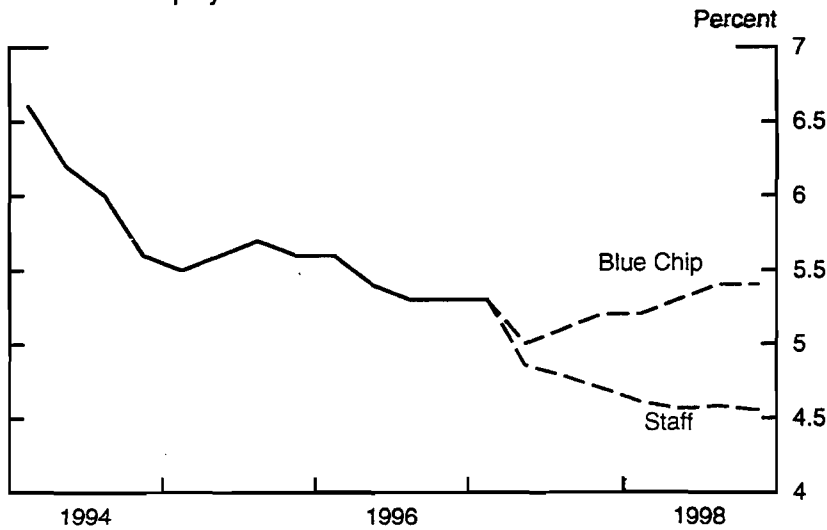
Real GDP



Q4/Q4 percent change

1994	3.5
1995	1.3
1996	3.1
1997	3.4
1998	2.1

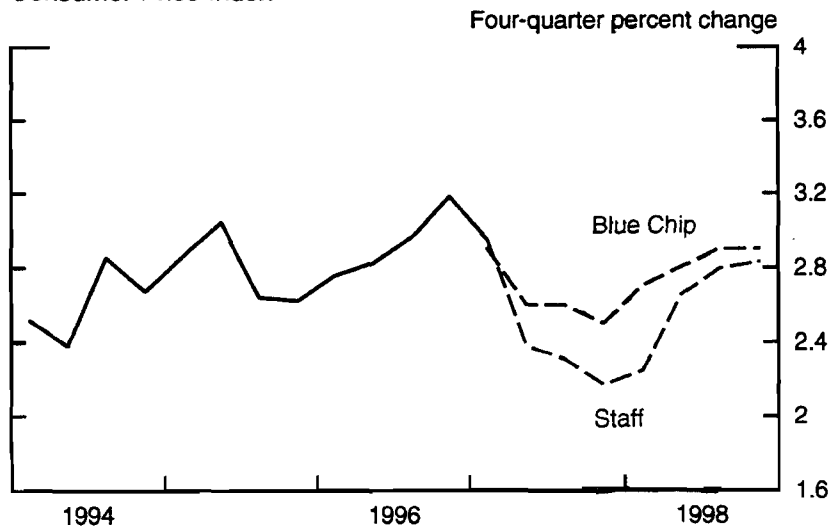
Civilian Unemployment Rate



Percent (fourth quarter)

1994	5.6
1995	5.6
1996	5.3
1997	4.7
1998	4.6

Consumer Price Index



Q4/Q4 percent change

	Ex. food & energy	
	Actual	Adj.*
1994	2.7	2.8
1995	2.6	3.0
1996	3.2	2.6
1997	2.2	2.7
1998	2.8	3.0

	Ex. food & energy	
	Actual	Adj.*
1994	2.7	2.8
1995	2.6	3.0
1996	3.2	2.6
1997	2.2	2.7
1998	2.8	3.0

*Adjusted for technical changes

Note: "Consensus" forecast, Blue Chip Economic Indicators, June 10, 1997.

Background Factors in the Staff Forecast

Financial environment

- Federal funds rate remains at current level this year and then moves up moderately in 1998.
- Long-term rates begin to firm later this year reflecting inflation concerns, and rise a bit further next year as the System tightens.
- Stock prices climb further in the next few months; but disappointing profits, coupled with higher interest rates, lead to an appreciable correction next year.

Fiscal policy

- The deficit widens slightly.
- Revenue growth slows in FY98, while outlays increase at about the pace of recent years.
- The macroeconomic consequences should be negligible.

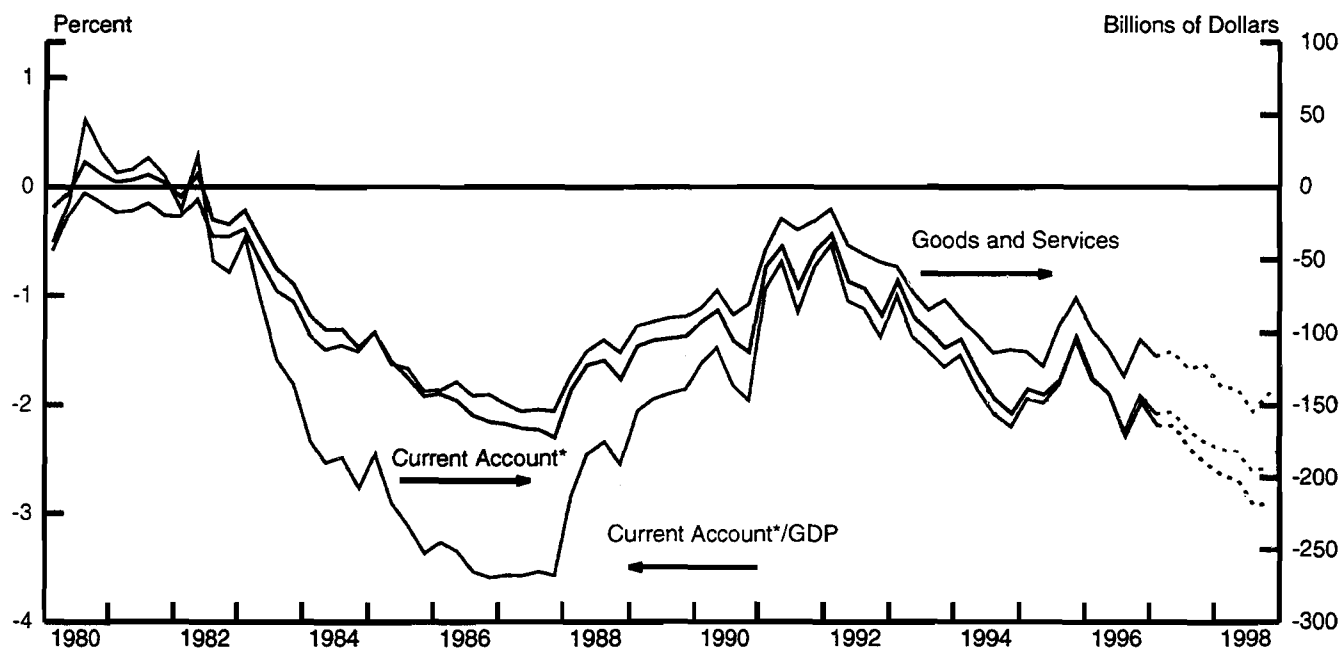
Federal Fiscal Indicators

	1995	1996	1997	1998
Unified deficit (\$billions, fiscal year)	163.9	107.2	59.1	84.7
Fiscal impetus (calendar year)*	-.4	-.1	-.2	-.1

* Percent of GDP; negative values indicate restraint.

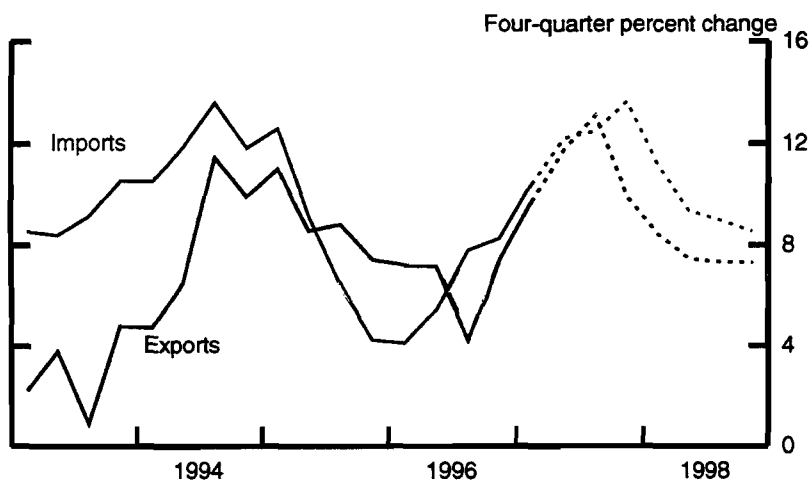
Chart 3

Forecast Summary: External Sector



* Excludes cash grants received for the Gulf War.

U.S. Real Net Exports of Goods and Services



Contribution to Real GDP Growth*

Percentage Points	
1995-H1	-0.5
1995-H2	1.1
1996-H1	-0.9
1996-H2	0.5
1997-H1	-1.0
1997-H2	-0.3
1998-H1	-0.5
1998-H2	-0.2

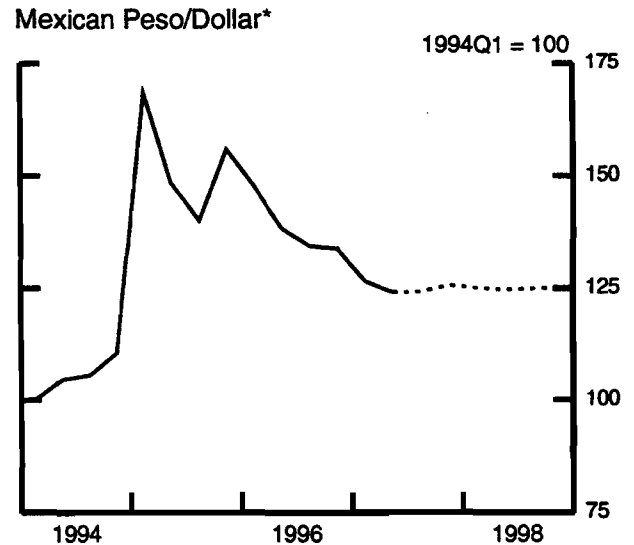
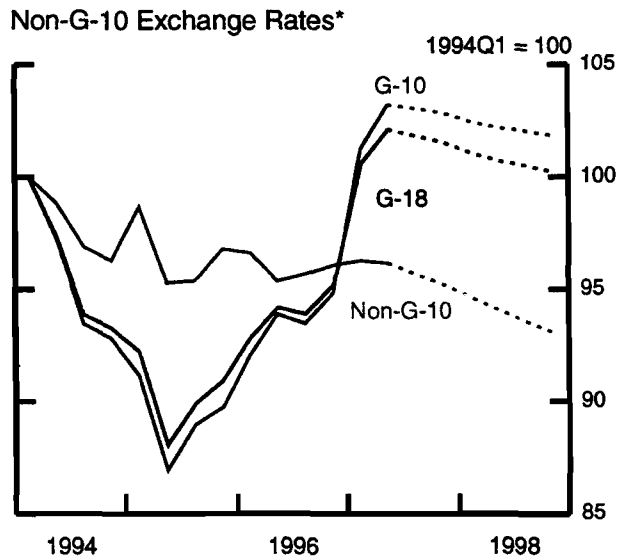
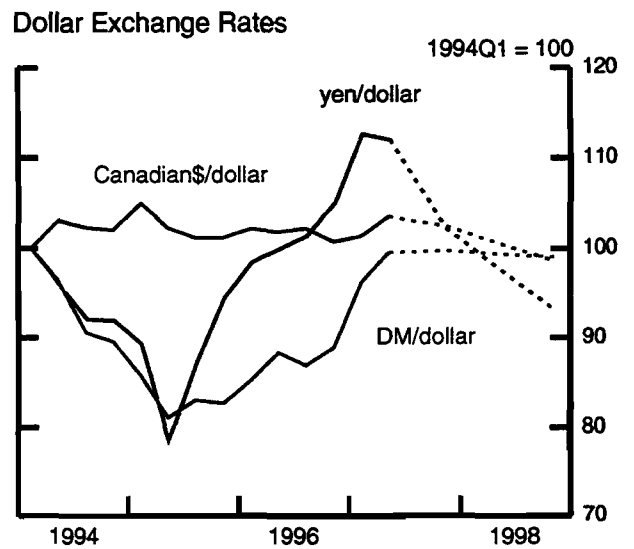
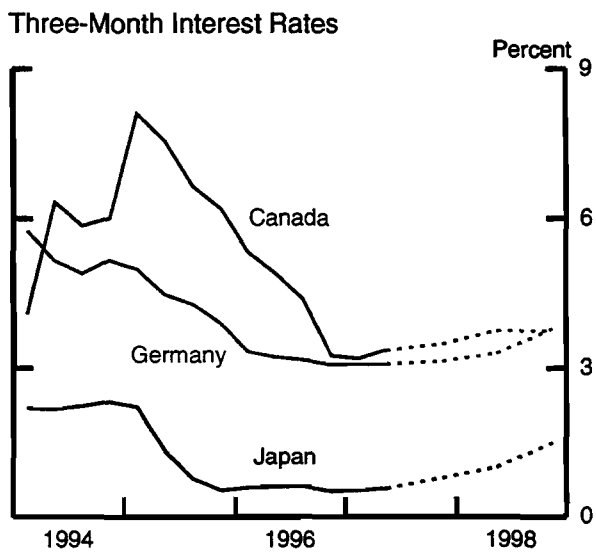
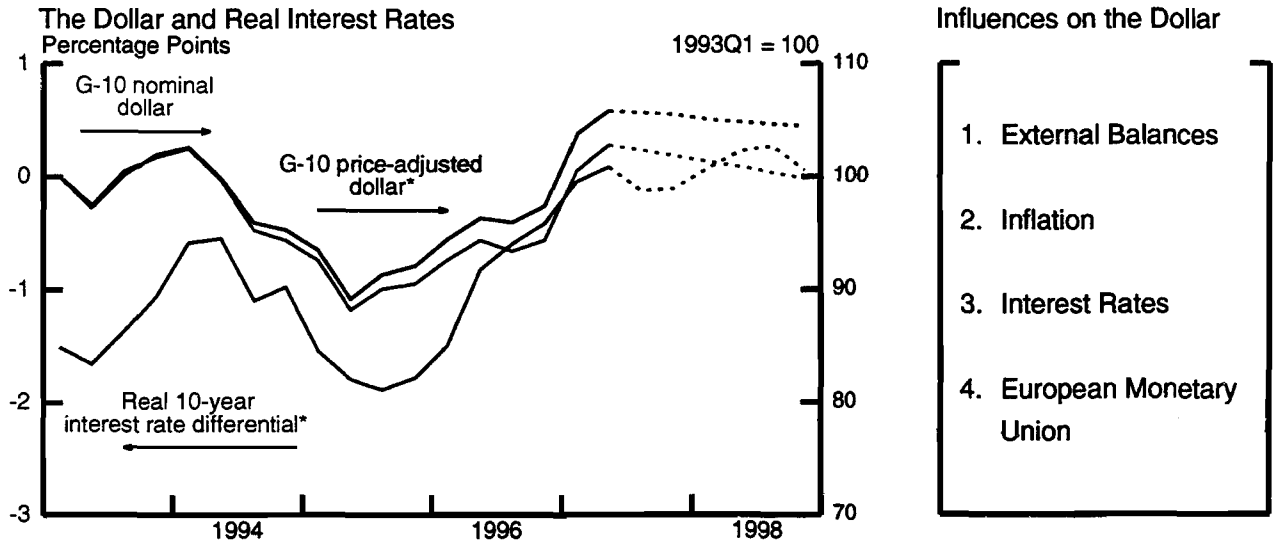
* From end of previous period.

Issues in the Outlook

1. Exchange Rates
2. Foreign Outlook
3. Imports

Chart 4

Exchange Rates and Interest Rates

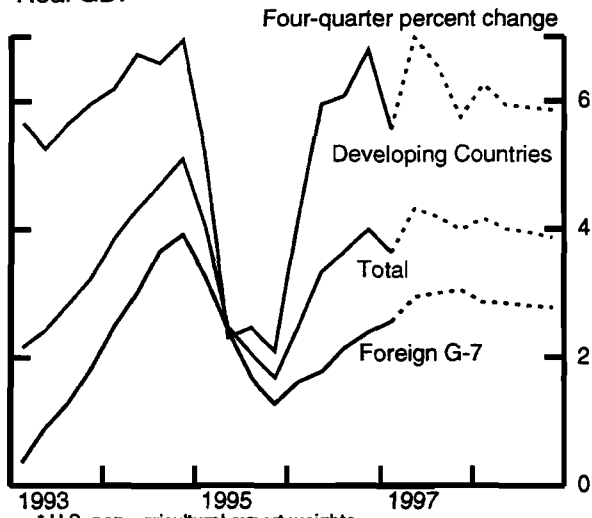


*Adjusted by consumer prices.

Chart 5

Foreign Outlook and U.S. Exports

Real GDP*



* U.S. non-agricultural export weights.

Percent change, Q4 to Q4

	1996	1997	1998
Japan	3.0	2.6	2.4
Canada	2.3	3.5	3.2
United Kingdom	2.8	3.1	2.2
Euro Area**	2.2	2.8	2.7
Mexico	7.6	4.7	4.3
Other Latin Am.	4.2	3.9	4.0
Other Asia	6.9	6.6	7.0
Total*	4.0	4.0	3.9
Memo: United States	3.1	3.4	2.1

** Euro Area is EU-15 less Denmark, Greece, Sweden, U.K.

Consumer Prices

	Percent change, Q4 to Q4		
	1996	1997	1998
Japan	0.1	1.5	0.6
Canada	2.0	1.4	1.6
United Kingdom	3.2	2.6	2.7
Euro Area*	1.9	1.7	1.8
Mexico	28.1	19.0	12.5
Other Developing*	4.2	4.0	4.4
Total*	4.1	3.5	2.9
Memo: United States	3.2	2.1	2.8

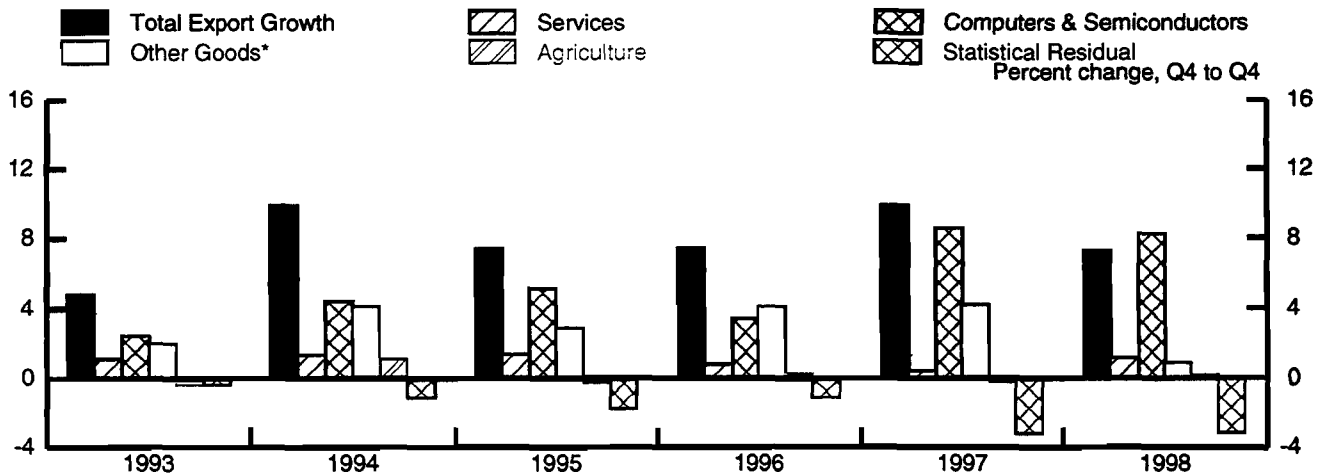
* U.S. non-oil import weights; harmonized indexes for Euro Area

Output Gaps

	Percent of Potential	
	1996Q4	1998Q4
Japan	-1.5	-0.5
Canada	-2.6	-0.8
United Kingdom	-0.4	0.2
Euro Area*	-2.0	-1.3
Germany	-1.0	-0.5
France	-2.2	-0.9
Italy	-3.1	-3.0

* GDP weights.

Contribution to Growth in Real Exports of Goods and Services

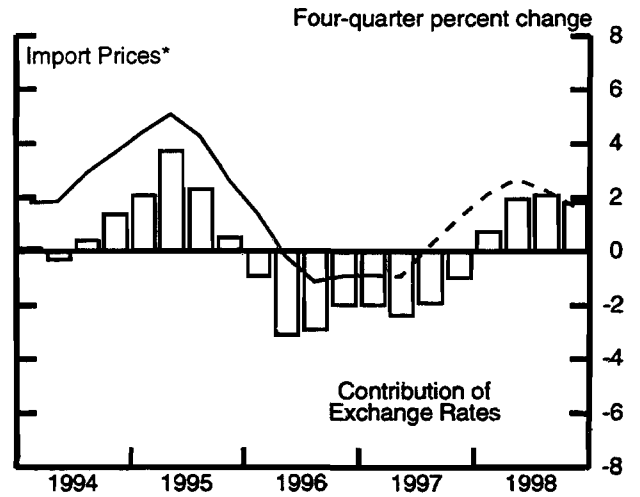
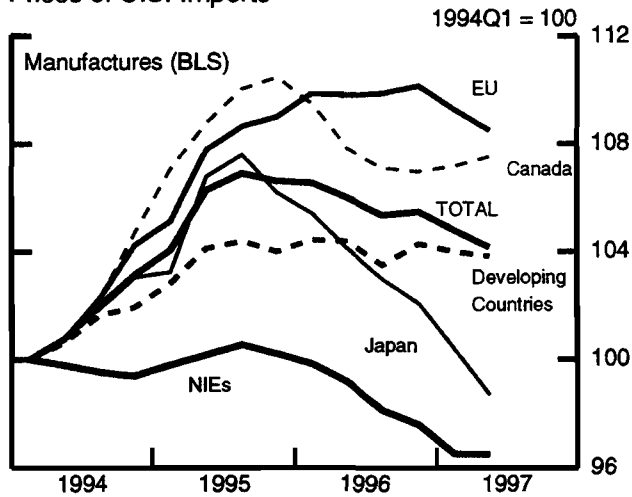


* Excluding agriculture, computers and semiconductors.

Chart 6

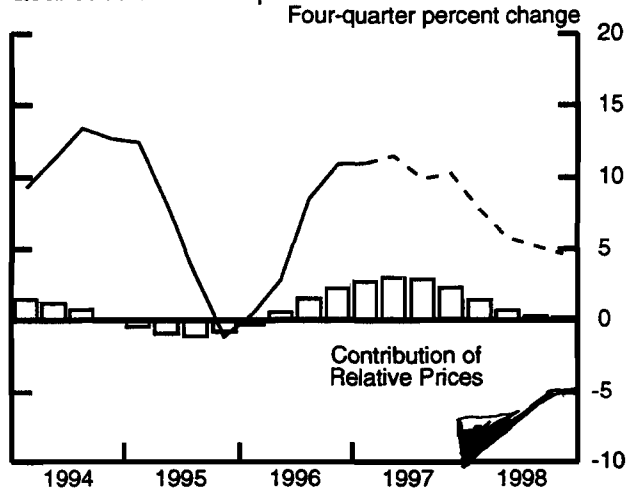
U.S. Imports

Prices of U.S. Imports

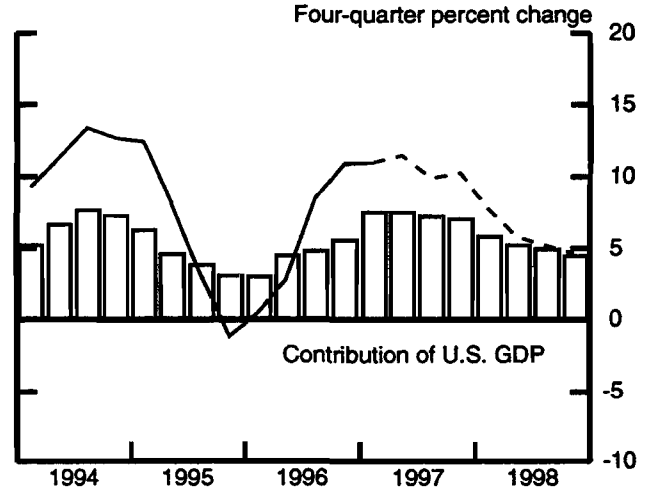


* Excluding oil, computers, and semiconductors; derived from NIPA.

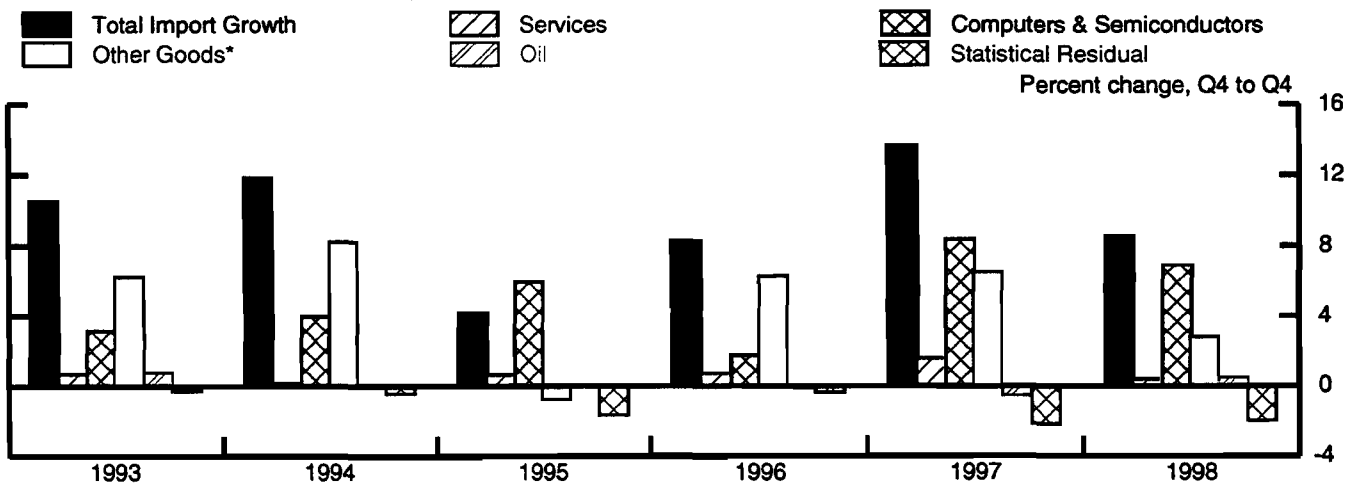
Quantities of U.S. Imports*



* Excluding oil, computers, and semiconductors.



Contribution to Growth of Real Imports of Goods and Services

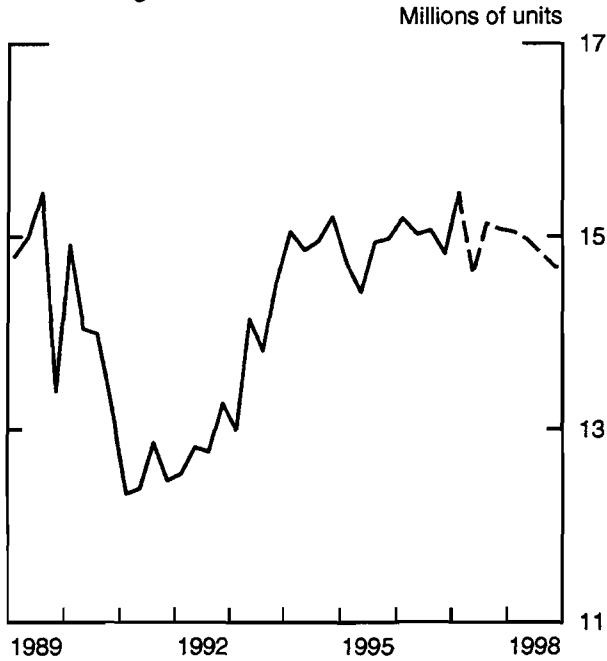


* Excluding oil, computers, and semiconductors.

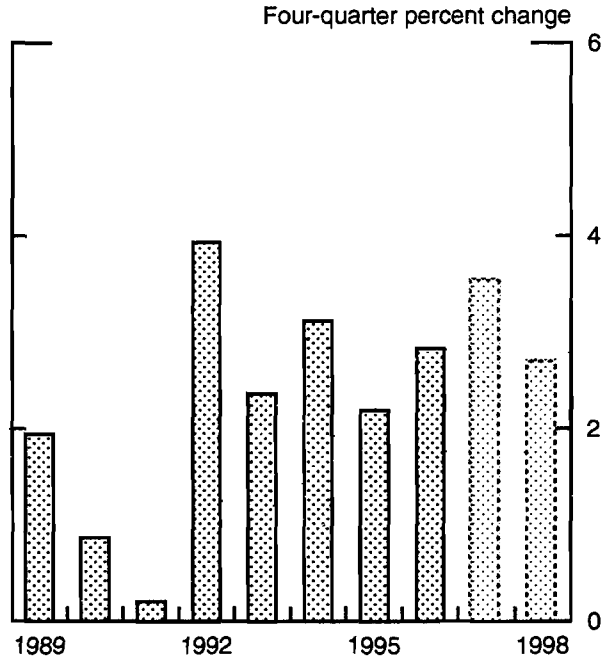
Chart 7

Consumption

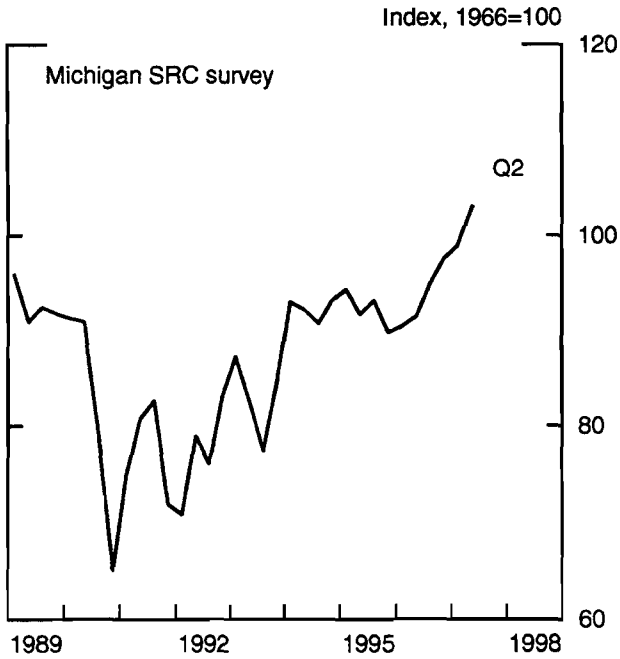
Sales of Light Vehicles



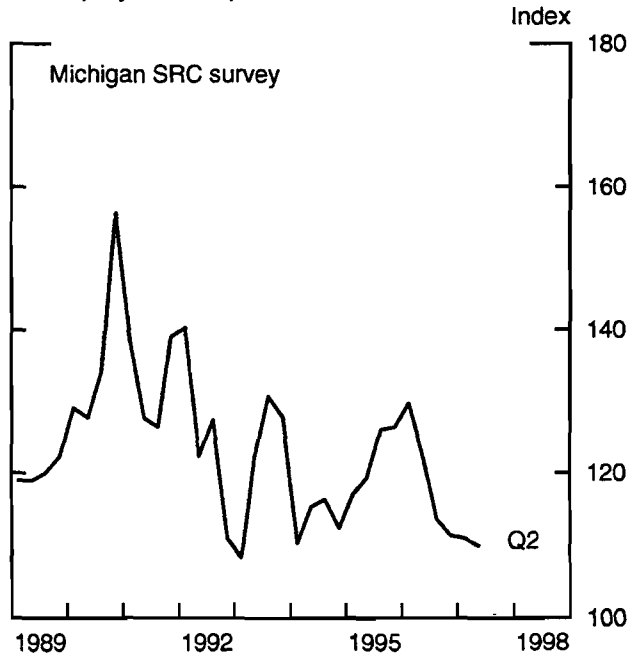
PCE Ex. Motor Vehicles



Consumer Sentiment



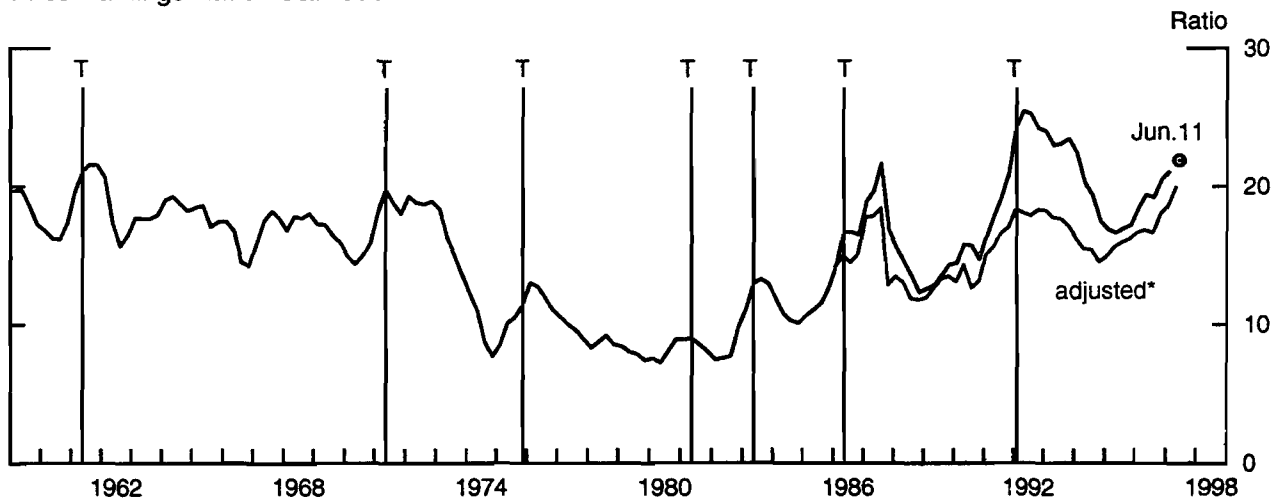
Unemployment Expectations



Note. Percent expecting unemployment to rise over next 12 months less those expecting unemployment to fall plus 100.

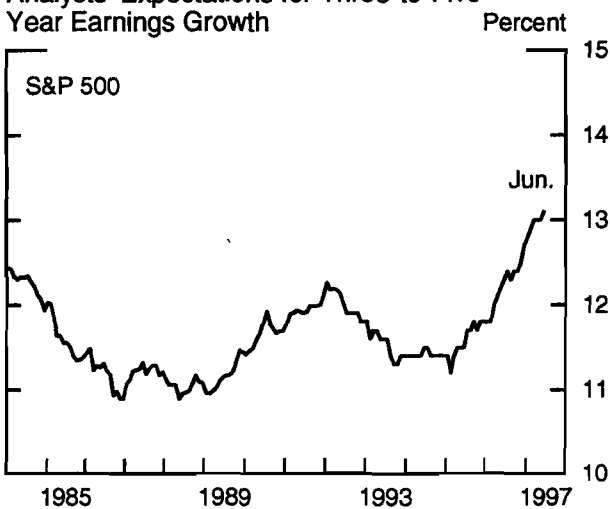
Chart 8

Price-Earnings Ratio - S&P 500



* Source: Goldman Sachs

Analysts' Expectations for Three-to-Five Year Earnings Growth



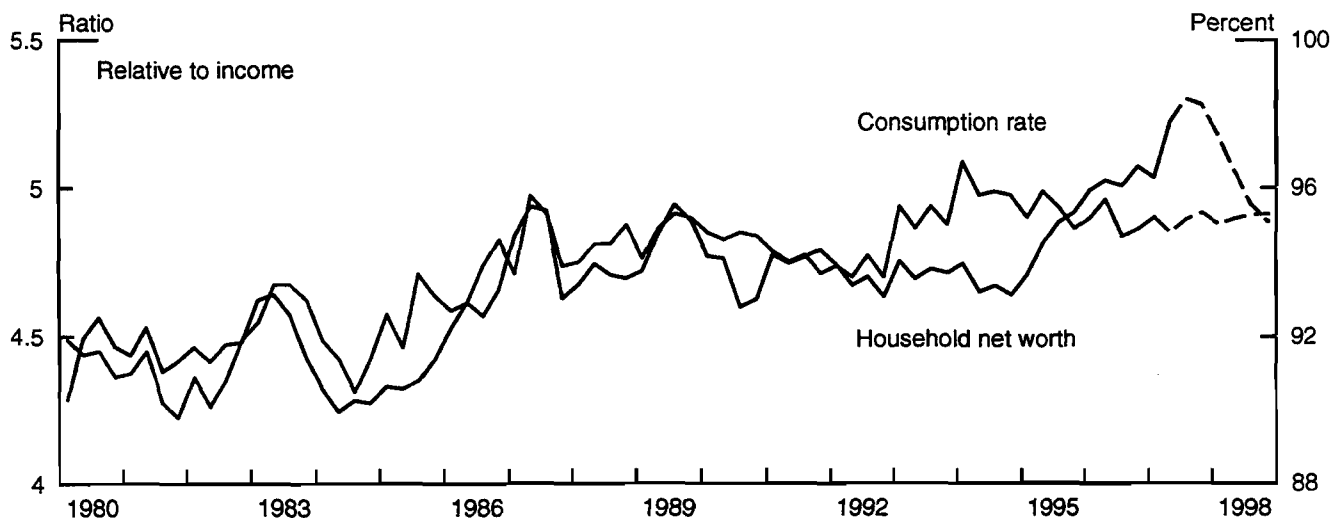
Source: I/B/E/S.

Before-Tax Economic Profits

	Annual average, percent change
1994	12.6
1995	9.1
1996	10.8
1997p	8.4
1998p	-0.4

p = Staff projection

Wealth and Consumption



Note: Consumption rate equals 100 minus the saving rate.

Chart 9

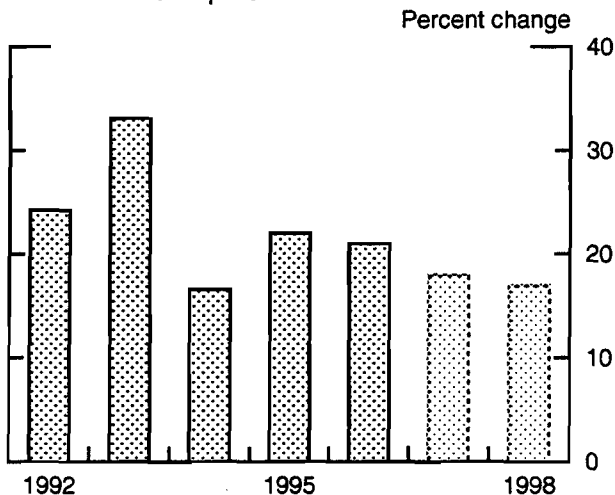
Business Investment

BFI Forecast

(Percent change, Q4 to Q4)

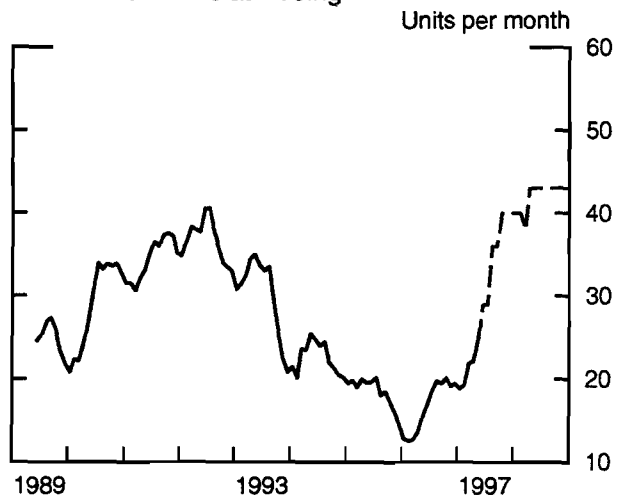
	1996	1997	1998
Producer's durable equipment	9.7	12.6	6.9
Computers	37.2	26.0	18.5
Aircraft	9.2	50.5	3.2
Other	2.1	6.4	.8
Nonresidential structures	9.0	4.5	4.3

U.S. PC Unit Shipments



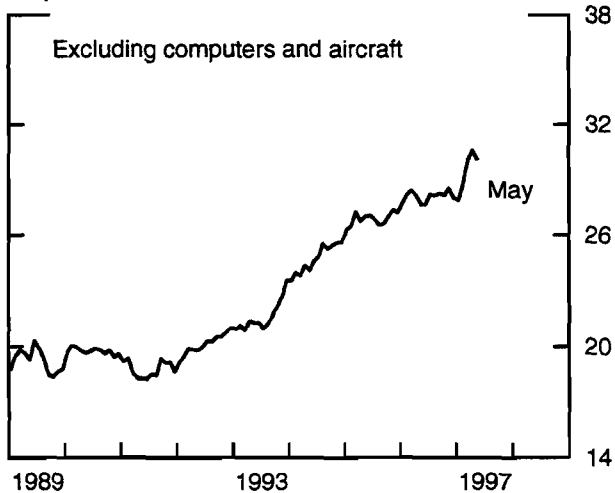
Source: Information Technology Industry Council

Aircraft Deliveries at Boeing



Note: Historical data are plotted as six-month moving average; forecast is Boeing's scheduled deliveries.

New Orders for Nondefense Capital Goods



Office Vacancy Rates

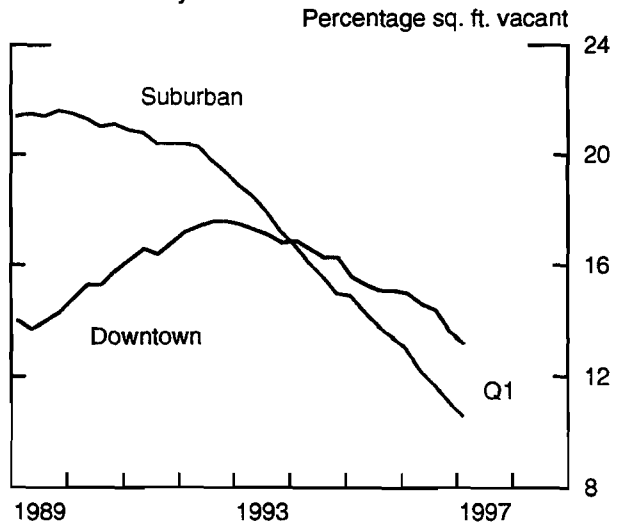
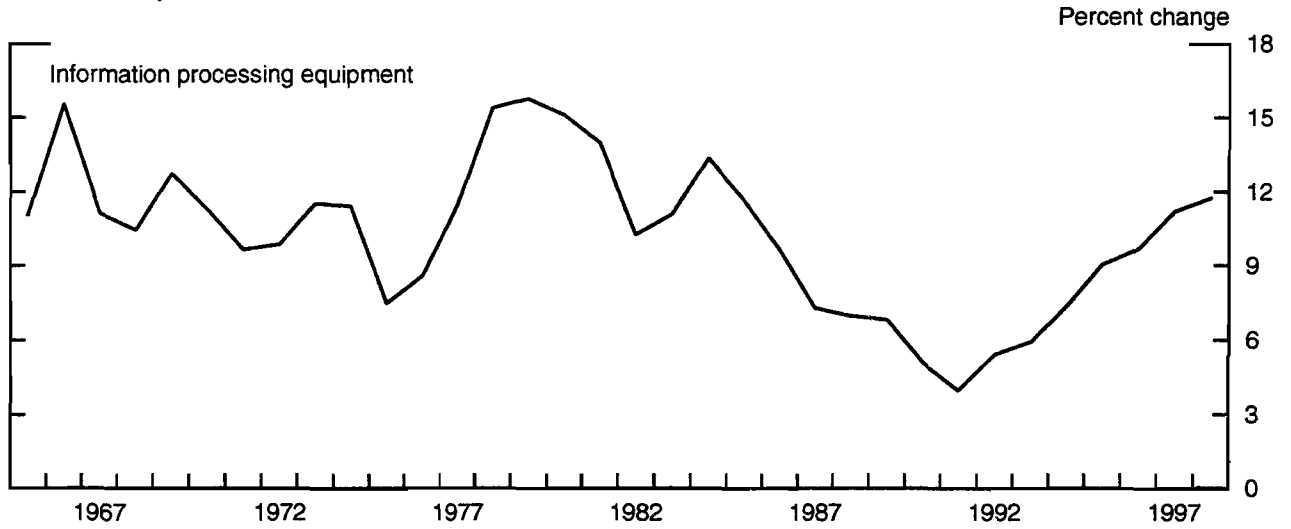


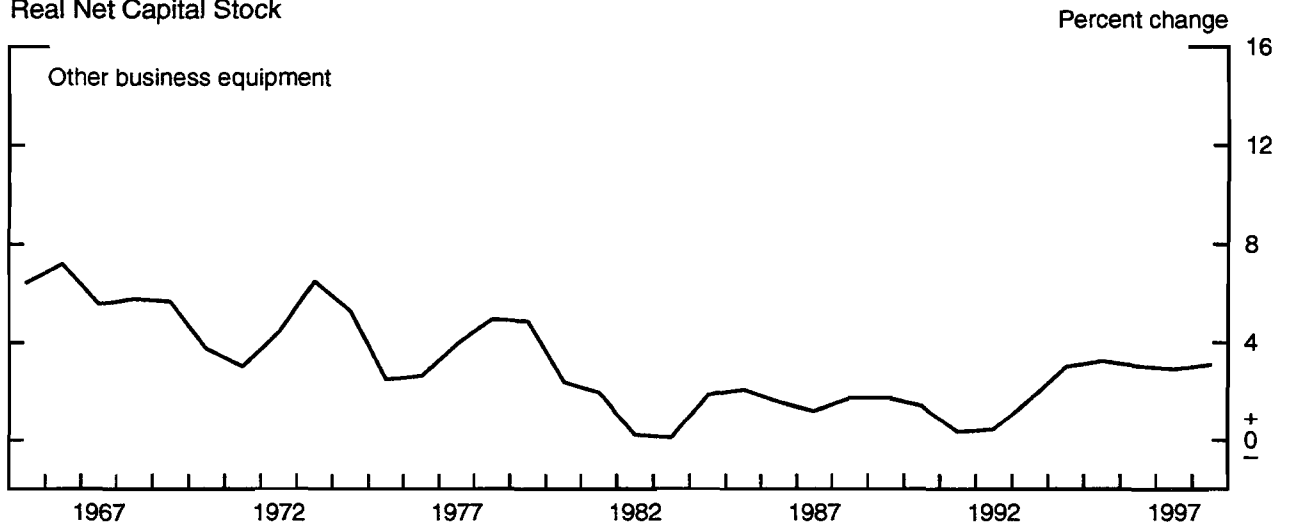
Chart 10

Real Net Capital Stock



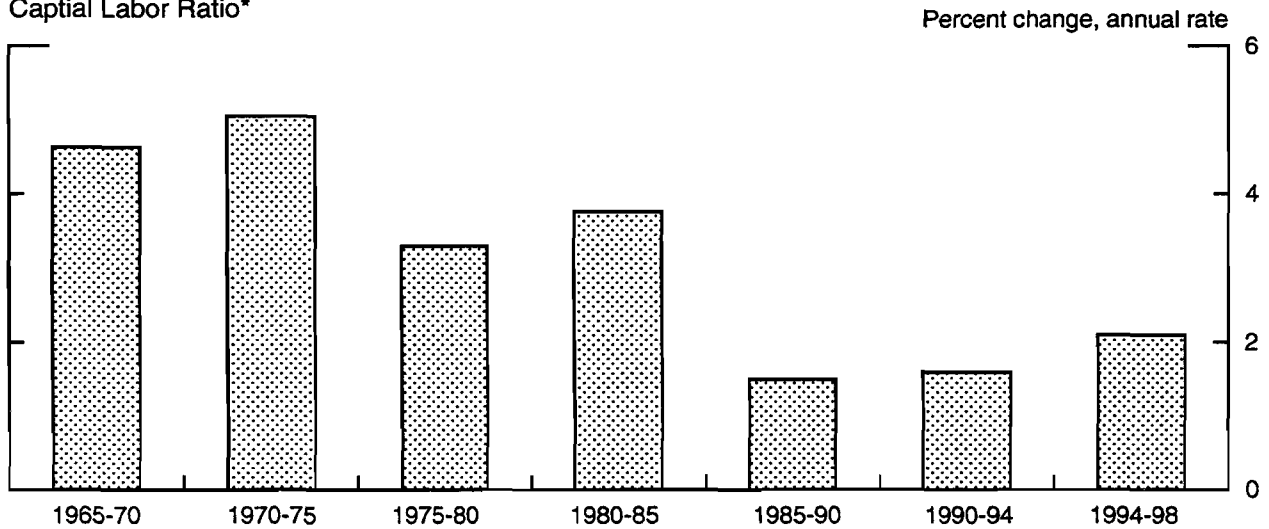
Note. 1996-1998 are staff estimates based on actual and projected investment

Real Net Capital Stock



Note. 1996-1998 are staff estimates based on actual and projected investment

Capital Labor Ratio*



* Capital input (equipment and structures) per labor hour.

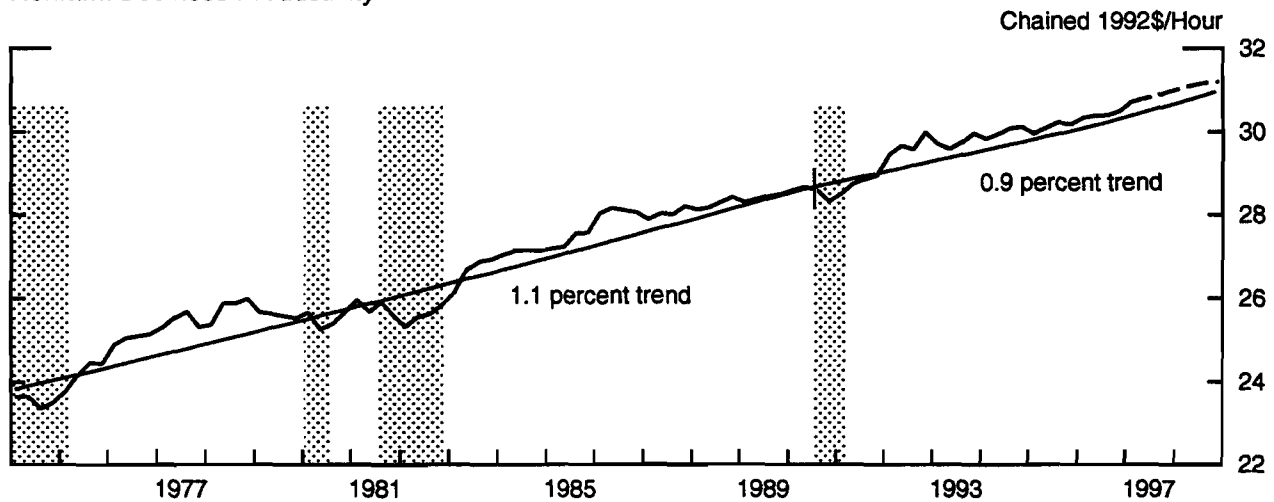
The Supply Side

Supply-side Components of Potential GDP
(Average annual growth rate)

	Long-term trends			Projection
	1960-73	1973-79	1979-90	1990-98
1. Potential GDP	4.1	3.3	2.7	1.9
2. Labor input	1.2	2.0	1.6	1.0
3. Labor productivity ¹	3.0	1.1	1.1	.9
4. Technical factors ²	-.1	.2	.0	.0

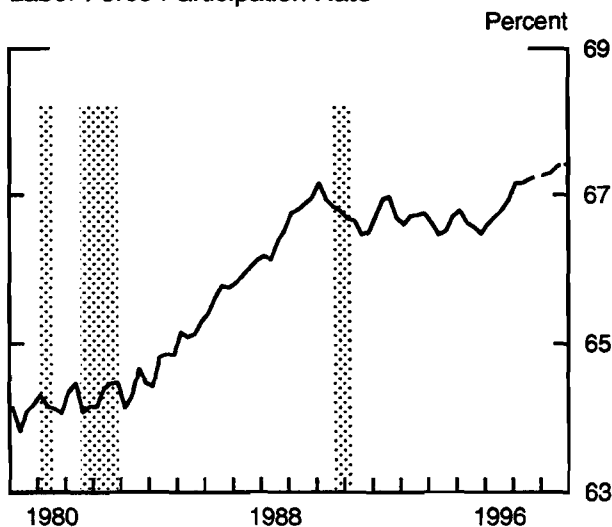
1. Nonfarm business sector.
2. Technical factors include: the ratio of GDP to the output of the nonfarm business sector; the ratio of nonfarm business employment to household employment; and rounding error.

Nonfarm Business Productivity*



* Adjusted to reflect anticipated revision.

Labor Force Participation Rate



Note: Adjusted for CPS revision.

Labor Force and Employment*

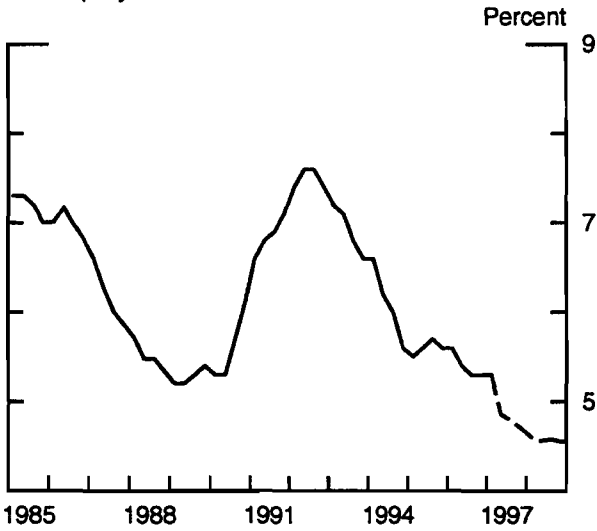
	Percent change, Q4 to Q4	
	Labor Force	Employment
1995	.5	.6
1996	1.8	2.0
1997	1.7	2.3
1998	1.2	1.4

* Household survey

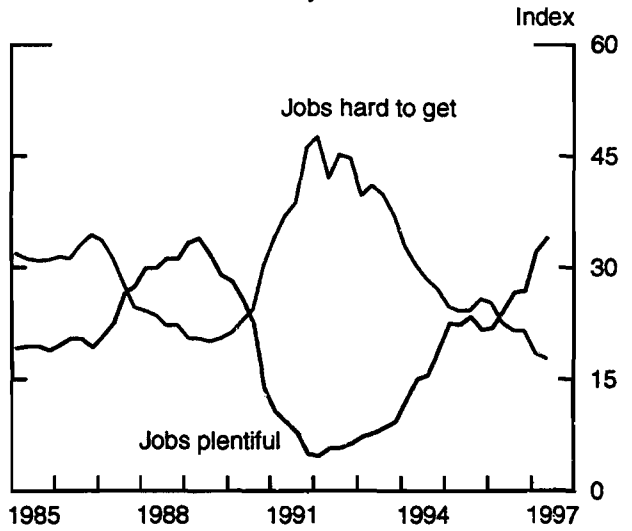
Chart 12

The Labor Market

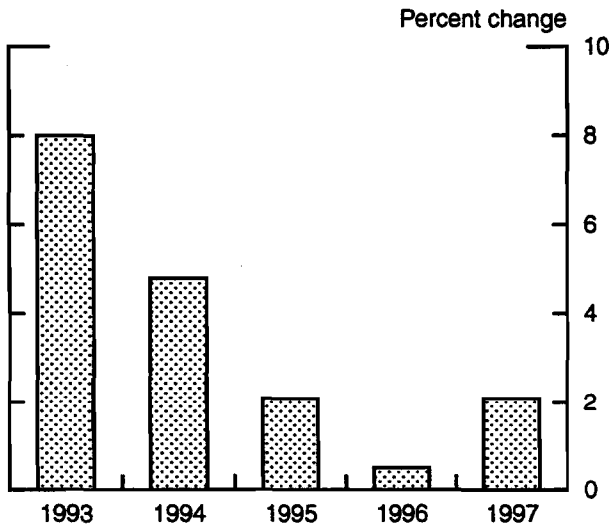
Unemployment Rate



Conference Board Survey

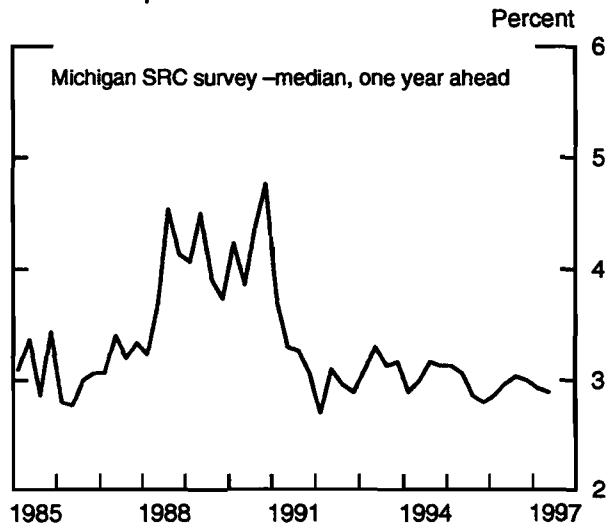


Health Insurance Premiums*



* KPMG survey

Inflation Expectations



Employment Cost Indexes

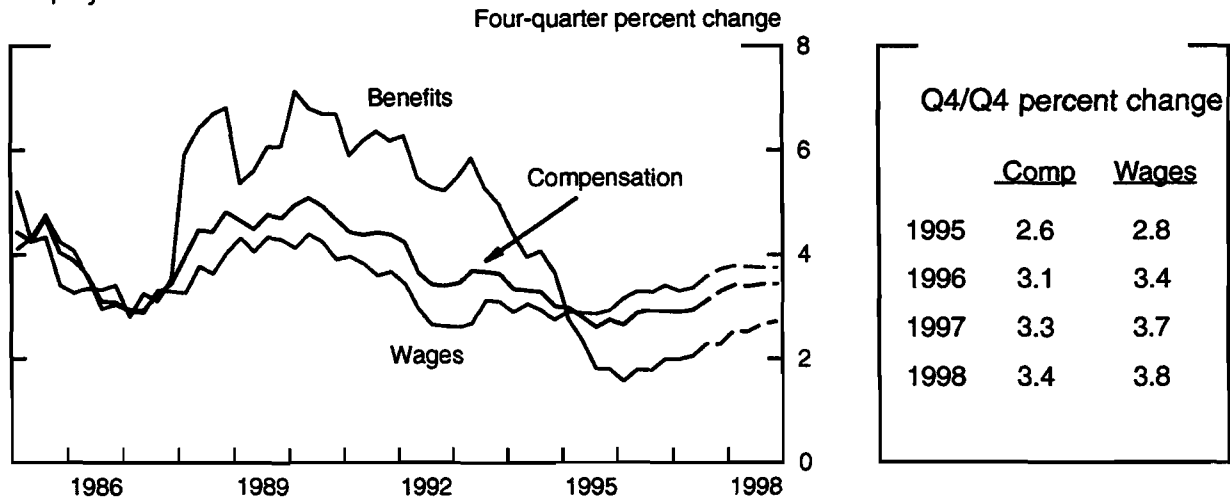
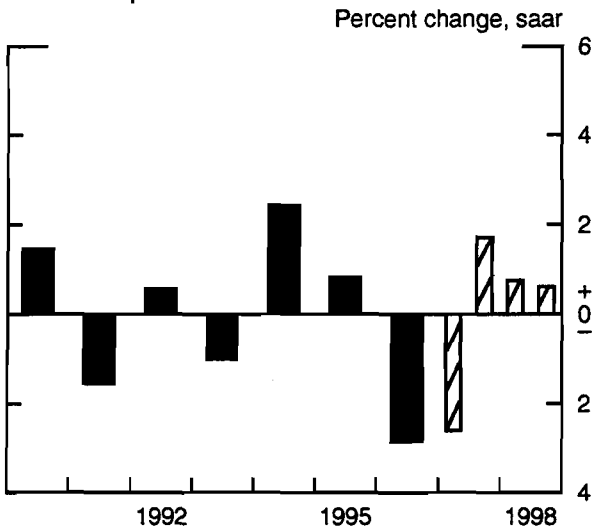


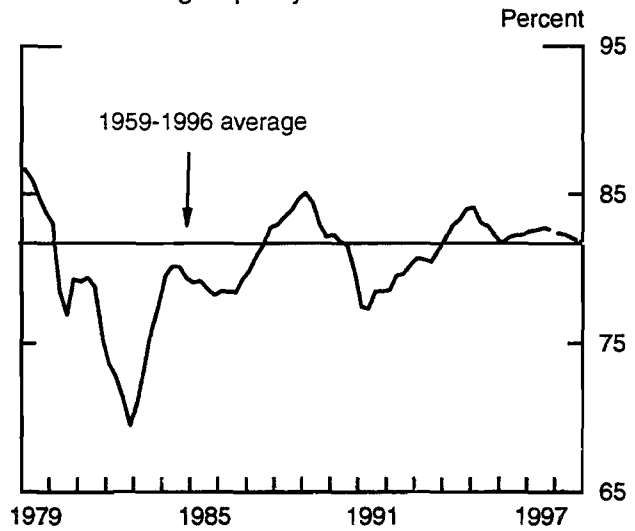
Chart 13

Product Markets and Price Inflation

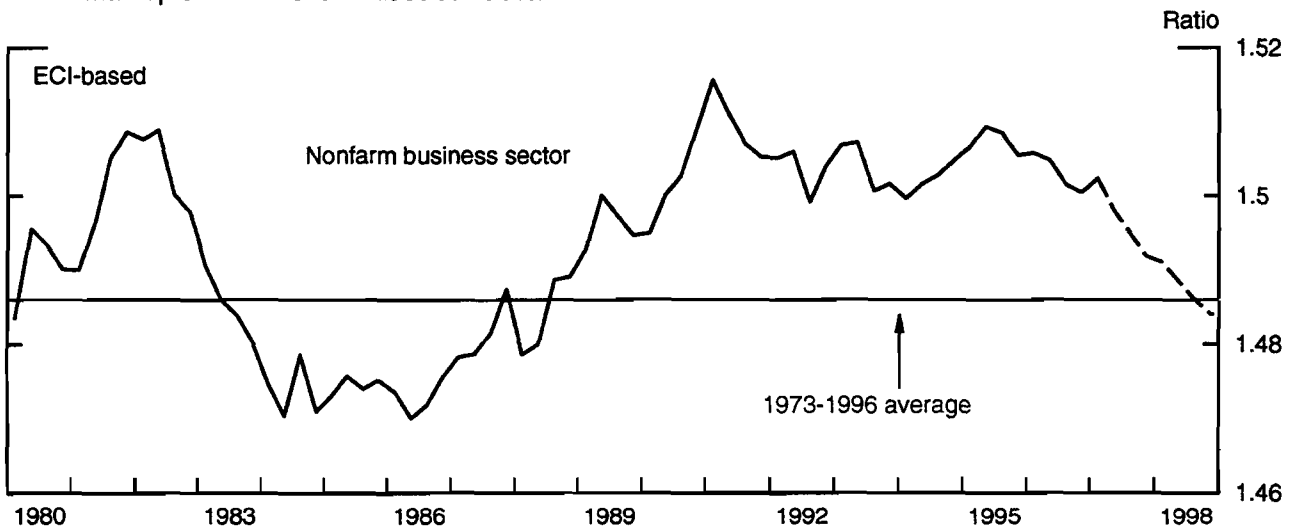
Non-oil Import Prices



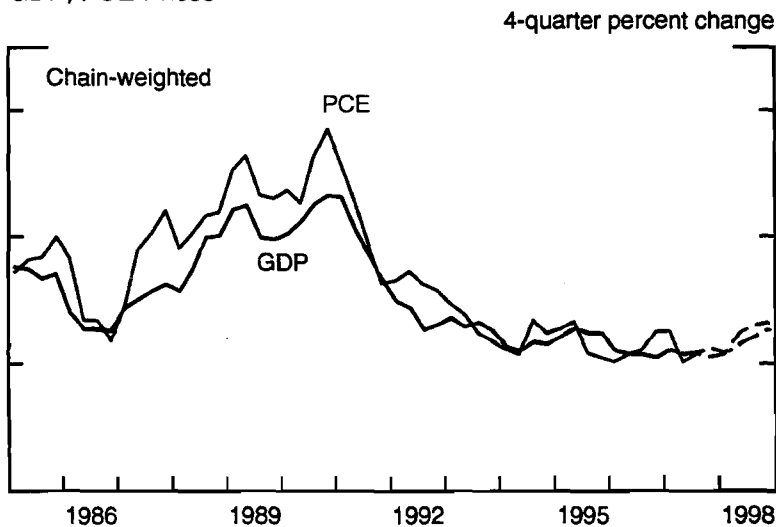
Manufacturing Capacity Utilization



Trend Markup of Prices over Unit Labor Costs



GDP, PCE Prices

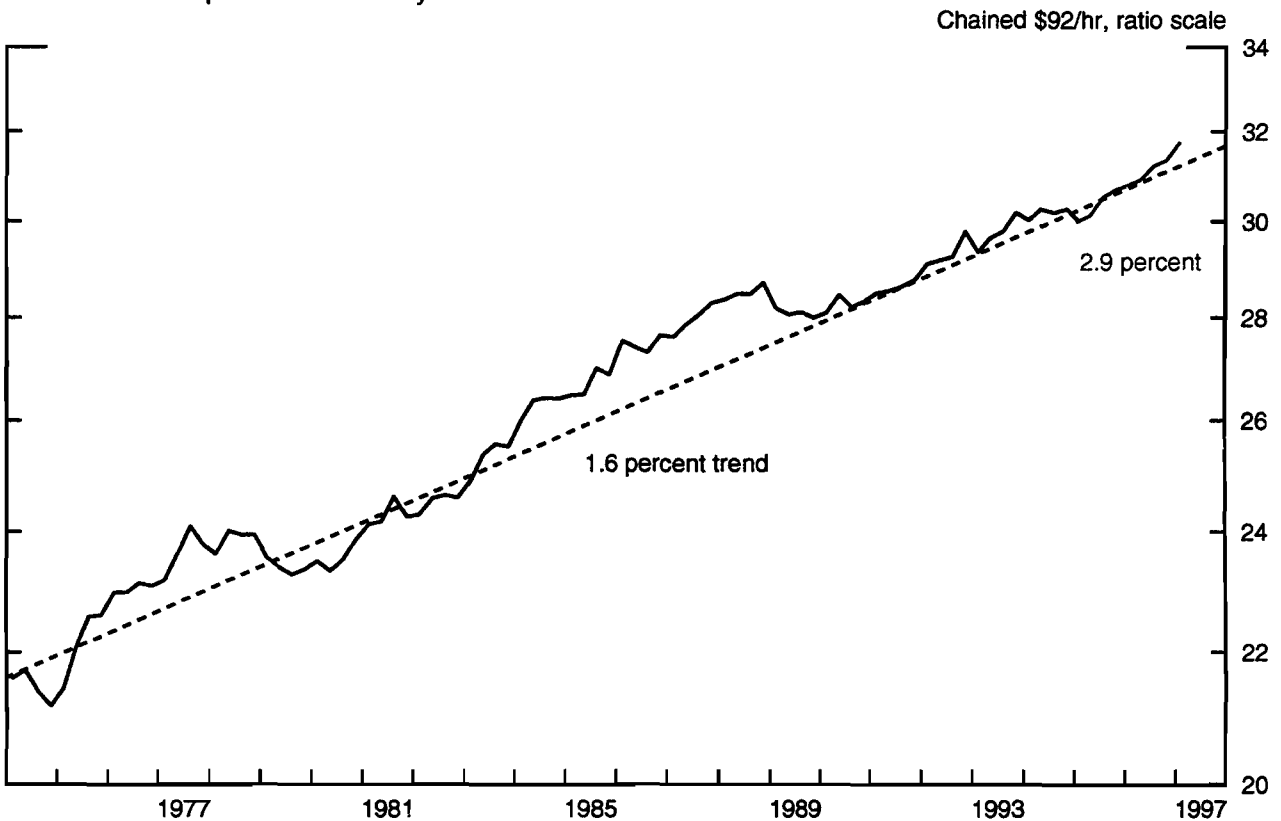


Q4/Q4 percent change		
	<u>GDP</u>	<u>PCE</u>
1995	2.5	2.1
1996	2.1	2.5
1997	2.2	2.1
1998	2.5	2.6

Chart 14

The Effects of Faster Productivity Growth

Nonfinancial Corporate Productivity



The Supply-side Effects

- Initially, business profitability increases.
- Price inflation is reduced.
- Real wages rise more quickly through a combination of lower price inflation and some pickup in nominal wage inflation.

The Demand-side Effects

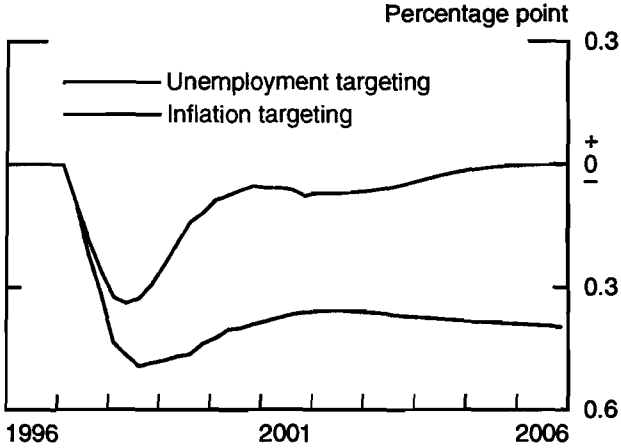
- Investment demand strengthens as firms expand capital spending to exploit enhanced profit opportunities.
- Consumer spending accelerates as households respond to higher permanent income.

Chart 15

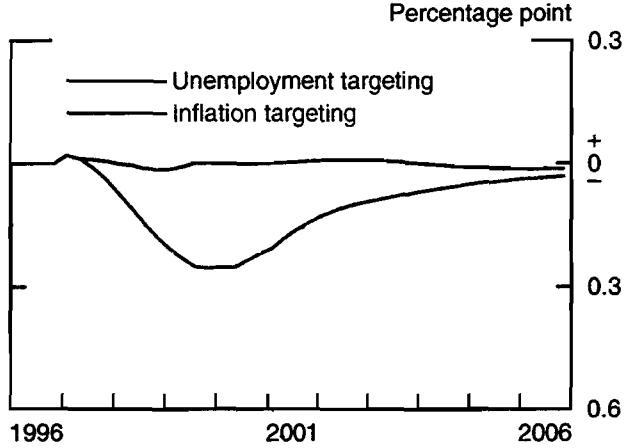
Alternative Scenarios with Faster Productivity Growth

(0.5 percentage point per year faster productivity growth;
deviations from baseline)

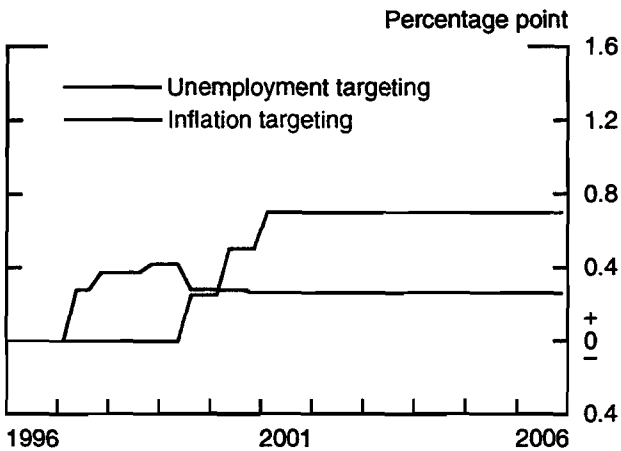
PCE Inflation



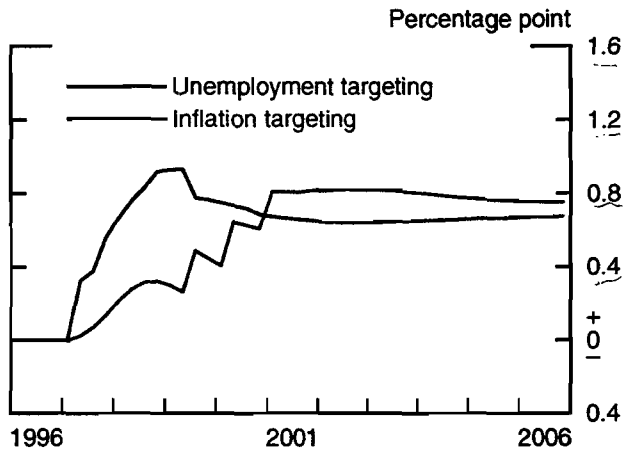
Unemployment Rate



Nominal Federal Funds Rate



Real Federal Funds Rate



Baseline and Alternatives

	1996	1997	1998	1999	2001	2006
PCE Inflation (Q4 to Q4 percent change)						
Baseline	2.5	2.1	2.6	2.9	3.2	3.2
Unemployment targeting	2.5	1.9	2.1	2.4	2.8	2.8
Inflation targeting	2.5	2.0	2.3	2.7	3.1	3.2
Unemployment Rate (annual averages)						
Baseline	5.4	4.9	4.6	4.8	5.6	5.6
Unemployment targeting	5.4	4.9	4.6	4.8	5.6	5.6
Inflation targeting	5.4	4.9	4.5	4.6	5.4	5.6

ECONOMIC PROJECTIONS FOR 1997

	FOMC		
	Range	Central Tendency	Staff
	—————Percent change, Q4 to Q4—————		
Nominal GDP	5 to 6	5 to 5 ¹ / ₂	5.4
previous estimate	4 ¹ / ₄ to 5 ¹ / ₄	4 ¹ / ₂ to 4 ³ / ₄	4.6
Real GDP	3 to 3 ¹ / ₂	3 to 3 ¹ / ₄	3.4
previous estimate	2 to 2 ¹ / ₂	2 to 2 ¹ / ₄	2.3
GDP Price Index	2 to 2 ¹ / ₂	2 to 2 ¹ / ₄	2.2
CPI	2 to 2 ³ / ₄	2 ¹ / ₄ to 2 ¹ / ₂	2.2
previous estimate	2 ³ / ₄ to 3 ¹ / ₂	2 ³ / ₄ to 3	2.6
	—————Average level, Q4, percent—————		
Unemployment rate	4 ³ / ₄ to 5	4 ³ / ₄ to 5	4.7
previous estimate	5 ¹ / ₄ to 5 ¹ / ₂	5 ¹ / ₄ to 5 ¹ / ₂	5.1

ECONOMIC PROJECTIONS FOR 1998

	FOMC		
	Range	Central Tendency	Staff
	—————Percent change, Q4 to Q4—————		
Nominal GDP	4 ¹ / ₄ to 5 ³ / ₄	4 ¹ / ₂ to 5	4.3
Real GDP	1 ³ / ₄ to 3	2 to 2 ¹ / ₂	2.1
GDP Price Index	2 ¹ / ₄ to 2 ³ / ₄	2 ¹ / ₂ to 2 ³ / ₄	2.5
CPI	2 ¹ / ₂ to 3	2 ¹ / ₂ to 3	2.8
	—————Average level, Q4, percent—————		
Unemployment rate	4 ¹ / ₂ to 5 ¹ / ₄	4 ³ / ₄ to 5	4.6

NOTE: Central tendencies constructed by dropping top and bottom three from distribution, and rounding to nearest quarter percent.

DStockton

7/1/1997

Price measurement for monetary policy

Over the past year, Committee members have raised a number of questions about the conduct of monetary policy in a low-inflation environment. In a paper circulated recently to the FOMC, my colleagues David Lebow, Deb Lindner, Dan Sichel, and Bob Tetlow focused in depth on issues surrounding the choice of a price measure to guide monetary policy and on defining zero inflation in terms of the available published price indexes.

We organized our project around four basic questions: First, what does economic theory suggest is the measure of prices most appropriate for judging the performance of monetary policy? Second, what are the statistical relationships among the major price indexes that we monitor? Third, what are the measurement errors in these indexes and what rate of change in these measures would correspond roughly to zero inflation? And finally, what would be the consequences for the stability of real output and interest rates, of focusing monetary policy on various measures of price inflation ?

Let me start with the guidance provided by economic theory. Unfortunately, theory does not point unambiguously to a specific price index to guide monetary policy. In principle, to answer the question coherently requires a complete model of the economy that incorporates all of the costs of inflation. Using such a model, one could trace monetary policy actions through to their effects on different price measures and then define a price objective to minimize the costs of inflation and inflation uncertainty. The problem is that no such comprehensive model exists. As a consequence, our analysis--like the literature--is somewhat compartmentalized and thus not entirely satisfying. That said, the authors note some useful observations.

One observation is that some costs of inflation point toward the desirability of stabilizing a broad measure of prices, with the choice determined by one's judgment about how inflation distortions are related to movements in various measures of aggregate prices. Households, businesses, and governments all participate in transactions that could be distorted by inflation, impairing efficiency and ultimately reducing society's consumption possibilities. Under these circumstances, stabilizing a broad collection of prices, such as the GDP price measure, might be appropriate. If one viewed household decisions, particularly those related to long-term saving and investment, as most susceptible to errors associated with inflation, greater weight might be placed on stabilizing a consumption price measure, such as PCE prices. But, we see little justification for considering, as a long-run objective, any narrower measure of prices.

A second observation is that the measure of prices implicitly embedded in nominal interest rates might be the appropriate objective of policy, especially if one were concerned about minimizing tax distortions and limiting the effect of the inflation risk premium on the cost of capital. What is this measure? We don't know. It would seem likely that interest rates are determined by the interaction of borrowers and lenders who must be considering a very broad range of prices in making their decisions. This is an issue that deserves some careful empirical attention.

Finally, we noted that there are some arguments in favor of including assets in the price index to guide monetary policy. Frankly, we didn't make much progress evaluating these arguments. And, in the end, we largely punted on the issue for three pretty good reasons: no theory, no data, and no empirical models. With respect to the theory, there is

surprisingly little work that addresses this issue. On the data side, constructing an index that included a reasonably comprehensive coverage of asset prices would be a monumental undertaking. Finally, targeting such an index, even if it were available, would be such a radical departure from your past behavior, econometric models estimated on historical data would not provide much guidance for policymaking. I'm afraid that this is an issue that remains on the research agenda.

In the second section of the paper, the authors address the question of whether, in practice, the choice of an inflation measure matters. If all the major measures move closely together over time, the choice of which index to focus on will not be very consequential. We employed a battery of statistical tests to determine whether most broad measures of inflation move together over long periods or drift apart; in the jargon of econometricians, we tested whether measures of inflation are cointegrated. We concluded that the most broad measures are cointegrated; that is, PCE, GDP, and CPI inflation do not drift apart over long periods of time.

However, that does not mean that these measures will always be giving the same signal about inflation. The paper presents spreads between the four-quarter changes of the major indexes. Over the past ten years, the GDP chain-weighted price index has increased, on average, about 0.3 percentage point per year less than the PCE price measure, and 0.5 percentage point per year less than the CPI. But year by year, these differences fluctuate considerably and can give conflicting signals about the magnitude and direction of inflation movements. For example, PCE inflation has run about 0.2 percentage point less per year than CPI inflation over the past ten years. But for a time last year, PCE prices were rising 3/4

percentage point less than the CPI, largely reflecting a smaller measured increase in medical care costs, which also receive a bigger weight in PCE prices. Given their different construction and data sources, it's not surprising that different indexes will, at times, provide conflicting signals about the movement of inflation.

In the third section of the paper, the authors review our current thinking about measurement bias in the CPI, and extend that analysis to GDP and PCE prices. Clearly, in assessing the performance of inflation relative to the objective of zero inflation, it is necessary to take account of the measurement bias in the relevant price indexes. As we have noted previously, our current best estimate of the annual bias in the CPI is about 1 percentage point. By 1999, we estimate that the bias will be about 0.8 percentage point per year. The smaller estimated bias largely reflects our assumption that BLS will implement geometric weighting for some item strata in the CPI next year, further reducing low-level substitution bias.

Because PCE prices, to a large extent, use CPI components in their construction, this index is subject to most of the same sources of measurement bias. The principal exception is that chain-weighting of the PCE price measure avoids the upper-level substitution bias that plagues the fixed-weighted CPI. We estimate that the overall bias in the PCE chain price index will be 0.6 percent per year in 1999--two-tenths less than the CPI. A little more guess work was involved in deriving a measure of the bias in the GDP price index. But using the available research and a dose of judgment, we estimate a bias of 0.7 percent per year.

There isn't much evidence on whether these biases might have changed over time. It's possible that the rapid pace of technical change that we perceive in recent years has led to an

intensification of measurement problems. But, the Stigler Commission established to study the CPI in the early 1960s reported with similar intensity many of the same quality adjustment and new goods bias problems that we discuss today.

In the final section of the paper, we explored how stabilization of various inflation measures might affect the behavior of real output and interest rates. Because certain price indexes are more sensitive to certain types of shocks, stabilizing different price measures could have different consequences for the variability of real output and interest rates. For example, because we consume more petroleum products than we produce, fluctuations in oil prices have larger effects on PCE prices than GDP prices. Consequently, if these were the chief source of inflation disturbances, limiting fluctuations in PCE prices could result in larger fluctuations in real output than would a similar stabilization of GDP prices. Of course, the opposite could be true as well; domestic productivity shocks would have larger effects on production prices than consumption prices.

In the event, stochastic simulations of the staff's econometric model using shocks that have typified the past thirty years suggested macroeconomic performance would not be much affected by the inflation measure that is stabilized. Stabilizing either PCE or GDP price inflation results in about equal volatility of real output around potential. Roughly the same result held when we used shocks drawn from the events of the past ten years--PCE and GDP prices perform about equally well.

Finally, we compared targeting PCE prices to targeting core PCE prices. We found that we could achieve lower combinations of inflation and output variability when policy responded to the total PCE inflation measure rather than just the core measure. Within the

context of our model, this result occurs because food and energy shocks have effects that feed back onto real output and inflation. If policymakers ignore the potential propagation of these shocks when they occur, they will have to push harder on real output later on to reverse these effects.

Two caveats are in order with respect to this finding. First, the result may be specific to our model. For example, if households and businesses largely ignore the effects of food and energy shocks in forming inflation expectations, the adverse feedbacks that are incorporated in our model might be smaller in reality. The second caveat is that policymakers may be able to sort out permanent from transitory shocks. Obviously, if we were confident in our abilities to make accurately that distinction, you could respond to the permanent shocks and largely ignore the temporary shocks. Nevertheless, the model results are useful in pointing out the danger of focusing on too narrow a price measure in making policy.

In conclusion, I think the authors covered a great deal of useful ground and made substantial progress in clarifying some of the issues that confront monetary policy in a low-inflation environment. However, we recognize that we still have a long way to go and that there are some significant gaps in our knowledge. In that regard, I should note that considerable work--both theoretical and empirical--is under way around the System to address the policy issues growing out of the U.S. economy's approach to price stability.

MONEY AND DEBT RANGES
FOMC BRIEFING
Thomas D. Simpson
July 2, 1997

The choice regarding annual ranges for broad money and debt conjures up a sense of *deja vu*. The staff is again projecting that growth in M2 will be near and M3 a little above the upper ends of their respective ranges for this year. Moreover, the picture does not change greatly for next year, measured against the current ranges which were first selected in mid-1995. In contrast, debt of domestic nonfinancial sectors continues to expand around the midpoint of the 3 to 7 percent range that was first adopted at the beginning of 1995.

Perhaps the best way to examine these projections is to begin with debt. The top panel of your first exhibit shows that we expect debt this year and next to continue growing in the 4-1/2 to 5-1/2 percent shaded area that has characterized the period since 1990. This is close to projected growth in nominal GDP this year and a little faster than GDP next year. The composition of total debt growth, however, is shifting a little from federal, the thin line, to private borrowing. Within the private sector, borrowing by businesses is expected to be boosted by healthy gains in capital outlays, in the context of little further improvement in internally generated funds, while household debt decelerates further but continues to outpace income. In the period ahead, we see private sector borrowing restrained only fractionally by a shift by creditors away from accommodation toward snuggling. With banks and thrifts healthy and lending continuing to be profitable, even as credit quality erodes a bit, we foresee depository credit growing in line with or a touch faster than debt over these two years, as shown by the thin line in the lower panel.

The top panel of your next exhibit illustrates the staff's projected funding by banks and thrifts of those depository credit flows. The M3 funding of depository credit, the shaded portion of the bars, picked up in 1995 around the time that depository credit moved higher. In particular, issuance of large time deposits, shown in the center panel for commercial banks, reversed course and has risen smartly ever since. Last year, M3 was lifted by some substitution of CDs for liabilities to foreign offices, the broken line, although that runoff may be drawing to an end, perhaps owing to the pickup in credit this year that needs to be financed. We expect recent funding patterns, with a considerable emphasis on M3 sources, to persist through next year.

We also expect that money market mutual funds in M3, shown in the memo line of the lower panel, will continue to grow very rapidly reflecting to their popularity for liquidity management, imparting some upward thrust to M3. As a consequence, the staff projects that M3 will grow 6-1/2 percent this year and 6 percent next year, also shown in the lower panel, extending to four the number of consecutive years of M3 growth in the 6 to 6-3/4 percent area.

Probably of more importance to the Committee is M2 and the issue of whether its recent behavior has been in line with a more traditional velocity relationship. Exhibit 3 plots the now-familiar relationship between M2 velocity, the vertical axis, and a measure of opportunity costs, the horizontal axis, and is the same as chart 6 in the bluebook. As illustrated in the upper panel, along the top line, recent observations remain in the cluster that has characterized the period since mid-1994, which is amplified in the lower panel. The implied velocity relationship--as embodied in the slope of the line--has properties that are quite similar to the one that characterized

the three-decade period ending in the late 1980s, the lower line in the upper panel.

The incoming evidence on the M2 relationship has, indeed, been encouraging. Staff analysis suggests that, in addition to a similar relationship with opportunity costs as before, recent experience has been consistent with less noise in the V2-opportunity cost relationship and a prompter response of M2 to movements in interest rates and income than before.

Nonetheless, the period of closer fit still is quite short in terms of statistical reliability, and one that has been on the tranquil side of longer historical experience. Moreover, the financial environment has changed in some important ways since the late 1980s, such as the much greater availability and lower transactions costs of long-term mutual funds, which as an analytical matter might suggest changes in velocity behavior. These considerations would seem to argue for continued caution in viewing M2 as a serious guide to policy or a key indicator of economic developments, although continued stability and predictability might suggest that unexpected movements in this aggregate deserve some weight in the constellation of indicators that you rely on in assessing economic and price trends.

Our forecast of growth in M2 for this year, 4-1/2 percent, falls a little shy of that of income and thus our expected Q4 velocity in the lower panel, shown by a red X, stands a little above that of Q4:1996. Next year, we are projecting that M2 growth, at 4 percent, will again fall short of income, implying a value of V2 for Q4:1998 shown by the other red X. The rise in V2 next year owes to some assumed monetary tightening over the second half of the year.

In view of these various considerations, the staff has suggested two alternative sets of ranges, shown on exhibit 4, which also appear on page 20 of the bluebook. Alternative I ranges are those adopted for 1997 by the Committee in February, and alternative II ranges are higher by 1 percentage point for M2 and 2 percentage points for M3, better centering them on staff projections both for this year and next. The suggested range for debt is the same under both alternatives. I would note that your central tendency for growth in nominal GDP, shown as a memo line, brackets the staff forecast for this year but is a little higher for next year. This implies that if your financial assumptions are similar to those of the staff, your expectations for money and debt growth, based on normal velocity behavior, are similar to those of the staff for this year but perhaps a bit stronger for 1998.

Should the Committee believe that velocity relationships are still rather uncertain and that the most effective role for the ranges continues to be as benchmarks of monetary growth under price stability and historically normal velocity behavior, then alternative I would again seem to be favored, both for 1997 and 1998. The midpoint of alternative I for M2 is 3 percent, close to staff's expectation of nominal GDP growth under price stability. Because we would also expect debt growth to average around 3 percent in these circumstances--the bottom of the current debt range--the Committee might want to consider lowering the range for debt to that of M2, were the debt range, too, to be viewed as a benchmark under price stability. However, changing any of the ranges could run the risk of being construed by the public as suggesting that the Committee would be placing greater emphasis on the money or debt aggregates in its conduct of policy than it has in recent years.

Should the Committee instead wish to announce ranges consistent with its expectations for money and debt growth, it still could choose between alternatives I and II. Alternative I ranges might be favored in this context if the Committee thought that velocity relationships had become reasonably predictable again and it wanted the ranges to convey expectations of money growth under a relatively tight policy stance designed to lean against upward inflationary pressures. Were there concerns that a boom economy might be in the offing, M2 in that event would likely breach the upper end of the alternative I range, providing a further rationale for imposing more monetary restraint.

Alternative II ranges are better centered on staff projections, given the Greenbook forecast and its financial assumptions. Moreover, they might be viewed as more consistent with the Committee's expectations for 1998, given your central tendency for nominal GDP growth. Furthermore, alternative II ranges provide greater scope for real output to expand in line with favorable supply shocks to the economy as well as a little more headroom if the Committee foresaw turbulence in equity markets as a distinct possibility and the monetary aggregates becoming a likely refuge for shell-shocked investors.

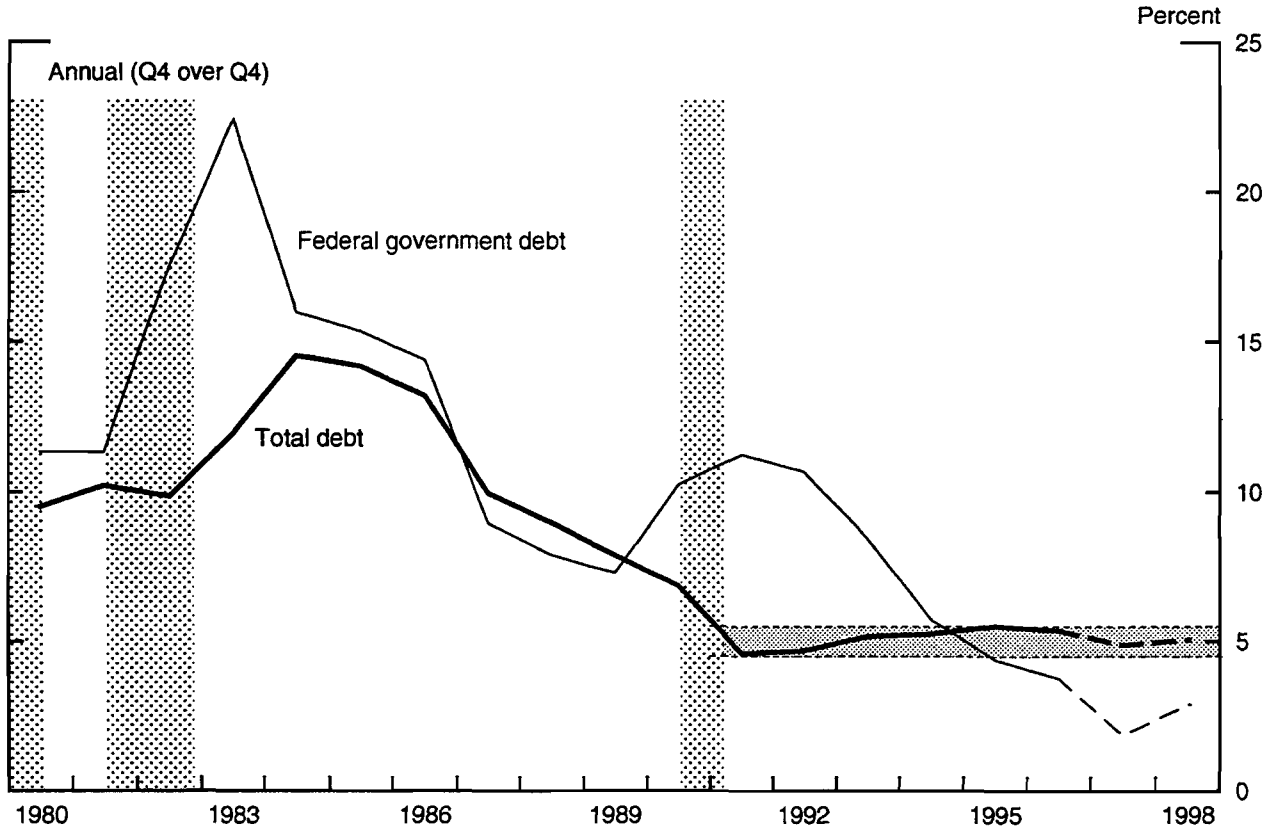
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**MATERIAL FOR STAFF PRESENTATION ON
MONEY AND DEBT RANGES**

July 1–2, 1997

Domestic Nonfinancial Debt

Growth of Total Debt and Federal Component



Growth of Total Debt and Depository Credit

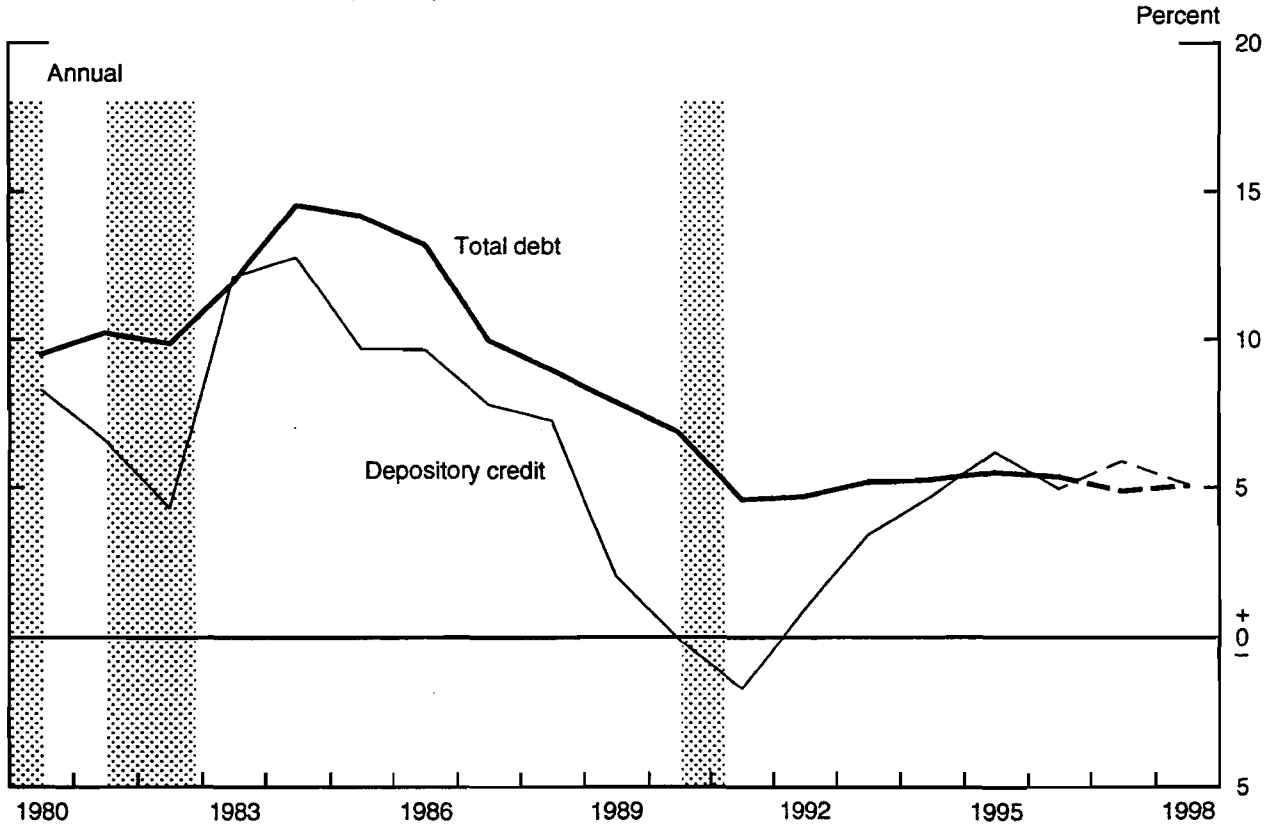
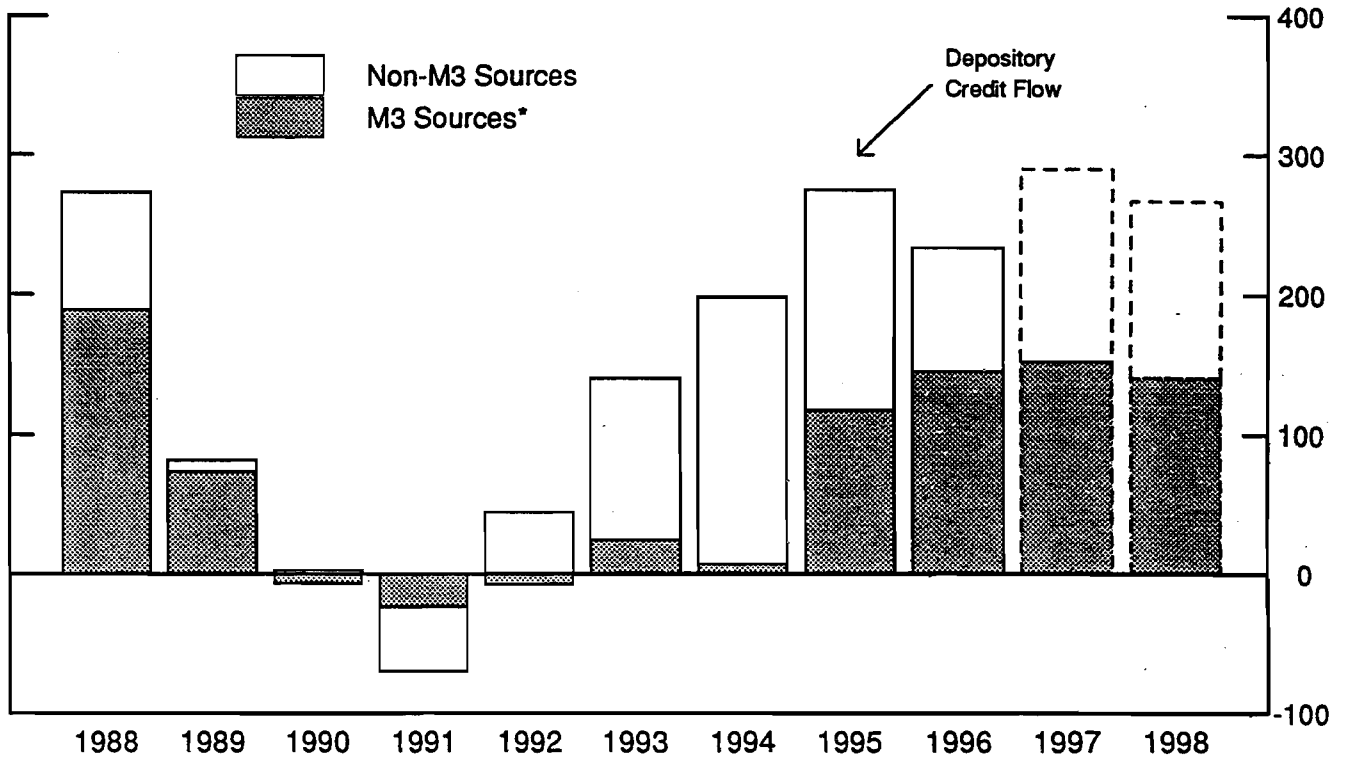


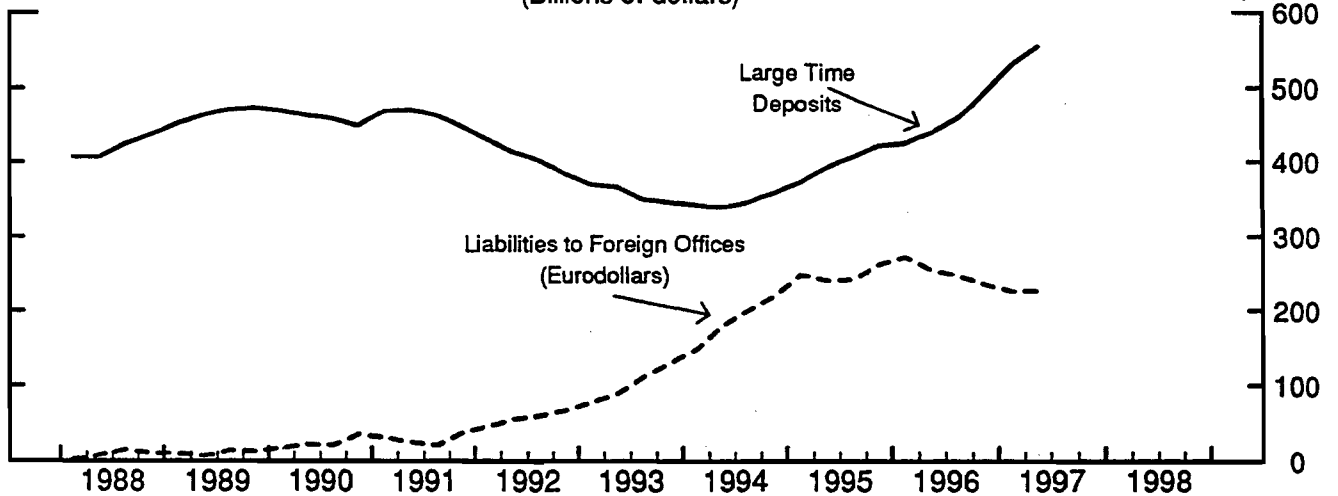
Exhibit 2

Flows of Depository Credit and M3 and Non-M3 Sources of Funding
(Billions of dollars)



*M3 sources are M2 deposits, large time deposits and RPs

Selected Commercial Bank Managed Liabilities Outstanding
(Billions of dollars)

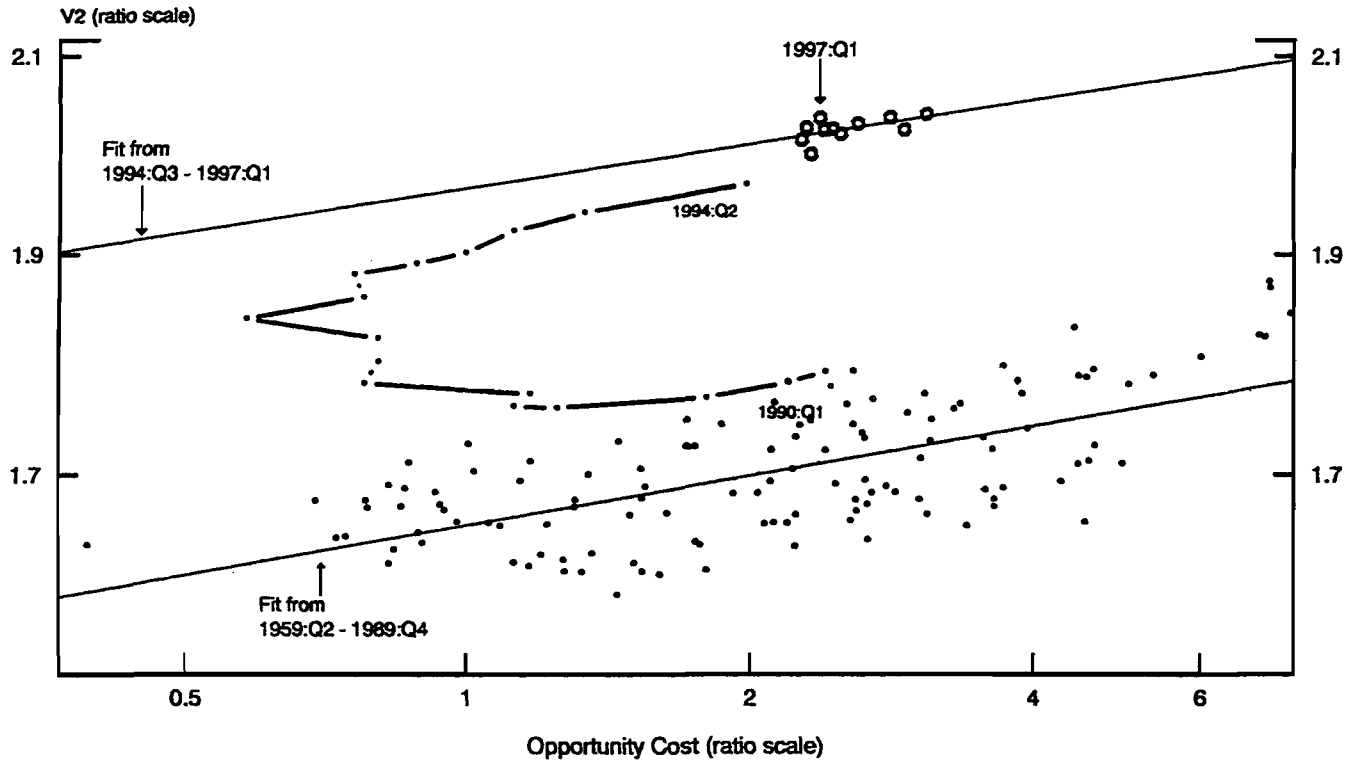


GROWTH IN M3
(Percent)

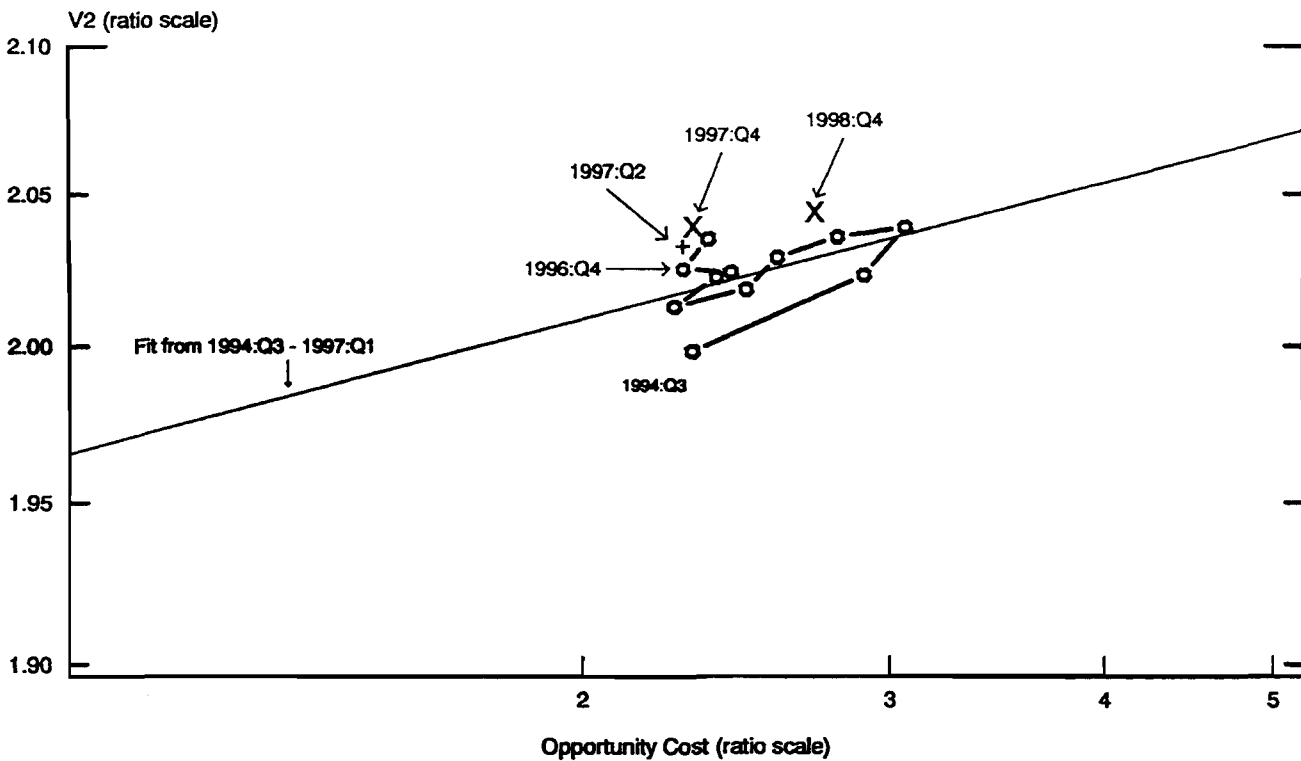
	1993	1994	1995	1996	Projection	
					1997	1998
M3	1.1	1.7	6.2	6.8	6-1/2	6
Memo:						
M3 money funds	-2	-5	24	20	15	16

Exhibit 3

M2 Velocity and Opportunity Cost
1959:Q1-1997:Q1



1994:Q3-1997:Q2; 1997:Q4, 1998:Q4



+ -- 1997:Q2 observation based on Greenbook forecast for nominal GDP and partially projected M2.
X - 1997:Q4 and 1998:Q4 observations based on Greenbook forecasts for nominal GDP and projections of M2.

Exhibit 4

GROWTH OF MONEY AND DEBT AND ALTERNATIVE RANGES
(Percent)

	1997 <u>(Projected)</u>	1998 <u>(Projected)</u>	<u>Alternative I</u>	<u>Alternative II</u>
M2	4-1/2	4	1 to 5	2 to 6
M3	6-1/2	6	2 to 6	4 to 8
Debt	5	5	3 to 7	3 to 7
Memo: Nominal GDP				
Staff projection	5-1/2	4-1/4		
FOMC central tendency	5 to 5-1/2	4-1/2 to 5		

July 2, 1997

FOMC Briefing
Donald L. Kohn

I'll begin with some thoughts on the longer-term strategies section of the bluebook, talk a bit about how the results of those exercises might--or might not--relate to the current situation and finish with proposed changes in the wording of the operational paragraph of the directive.

My take on the modeling exercises will start with chart 2 following page 6 of the bluebook. These simulations are built from the Greenbook forecast and illustrate the basic risk embodied in that forecast. Specifically, that the economy most likely is operating beyond its sustainable potential, and unless the Committee tightens sufficiently at some point, inflation will be on an upward trajectory.

This imbalance has opened up despite a real federal funds rate, shown in the upper right panel, that is at or even above its historical averages. Those historical averages do not factor in the extraordinary contribution of recent financial conditions in supporting spending. In effect, the rise in stock prices and unusually generous provision of credit to many private borrowers, through their effects on wealth and on the cost of funds, are seen as having substantially increased the equilibrium rate. In the staff forecast, narrowing profit margins take their toll on equity prices and credit availability, and fiscal policy continues to be modestly restrictive, reducing the equilibrium

rates. Eventually, a real funds rate around its current level becomes high enough to bring aggregate demand in line with long-run supply. But this happens over a period of years. In the interim, inflation picks up, so that merely avoiding a decline in the real funds rate will require raising the nominal rate--a process the Greenbook assumes gets started in the second half of next year.

If the staff has correctly identified the risks, the question is not whether the funds rate will have to be raised, but only when, by how much, for how long, and what will be the eventual inflation rate. Once an output gap has opened, inflation pressures begin to build, and the sooner action is taken, the less disruptive will be the needed adjustment. At this point, according to the model, holding inflation near its recent levels without incurring a recession--the "stable inflation" strategy--can be accomplished with fairly prompt action and a moderate rise in the nominal funds rate over the next year.

These simulations were done by taking the extended Greenbook forecast and manipulating the federal funds rate to achieve particular outcomes. A more general question concerns the Committee's strategy in responding to actual or expected deviations of output from potential and inflation from its objectives as the economy is subjected to unexpected developments. In particular, we were interested in comparing the consequences of a so-called opportunistic strategy--one that waits for favorable surprises to reduce inflation from moderate levels--to strategies that

deliberately seek lower inflation. To make this comparison, we needed to move away from the Greenbook projections and subject the staff's econometric model to a set of surprises that approximates those that have hit the economy over the last several decades. These are the stochastic simulations in the second part of this bluebook section. We tried to look at two potential issues--getting to price stability, and what happens once you're there.

As to the first issue, the results shown on chart 4 after page 12 address the transition from one steady state with inflation at 2-1/2 percent to another with inflation at 1 percent. The asymmetric responses of an opportunistic policymaker to inflationary and deflationary surprises under these circumstances do guarantee that the long-run inflation goal is eventually achieved. Not surprisingly, it takes considerably longer on average if a policymaker waits for favorable shocks rather than deliberately seeking price stability. In fact, the time to get to price stability under the opportunistic strategy depends on the nature of the shocks hitting the economy--the smaller the shocks, the longer the time. All policies ultimately entail about the same cumulative output loss, but the deliberate policymaker takes that loss earlier, for a shorter time, and in the form of larger output gaps than does the opportunistic policymaker. The model, as we used it, does not differentiate between deliberate and opportunistic policies in terms of the public's understanding of the System's objectives and hence the

credibility of policy. Moreover, it makes no provision for reduced distortions and enhanced efficiencies as inflation falls; presumably the choice between these approaches would rest, in part, on an evaluation of the benefits of achieving price stability sooner under a deliberate strategy relative to the costs of the sharper output losses likely to be involved.

Within the set of deliberate strategies, it is instructive to compare the Henderson-McKibben or target zone policy rules to the Taylor rule. Not only is attention to output gaps entirely consistent with achieving inflation objectives, but placing more weight on such gaps than on the deviations of inflation from its objective, as in the Henderson-McKibben rule, may involve achieving this goal on average with less wrenching adjustments.

Comparing chart 4 with chart 5, which is after page 15, raises the question as to whether strategies need to be adapted once the inflation objective has been reached. This is an important topic--and a full treatment would deal with the potential problems of the zero interest rate constraint, among many other issues. As you can see, given shocks of the nature of those of the last 30 years, there is a substantial probability of measured inflation falling below zero when one is your objective. In this limited exercise, opportunism, which to be sure is usually presented as a transition strategy, fares poorly in the steady state in terms of damping variations in inflation around a

goal. Henderson-McKibben seems to do very well, with its strong responses to inflation and especially output gaps.

But, I should caution, a number of caveats apply to this result, raising questions about whether vigorous policy responses are always advisable in the real world--especially the world you are facing now. First, the parameters of the Henderson-McKibben rule were derived to work well in a model not too dissimilar from the one actually used to generate these simulations. In addition, in using a model--and in particular its steady state--we are assuming that the underlying structure of the economy is known and does not change over time; in the exercises, all the surprises that the economy faces involve the positions of the various functions, not the slopes. The size of the coefficients that govern how the economy responds to monetary policy are known with certainty. As you discussed at your last meeting, some kinds of uncertainty--especially about the response of the economy to policy--do argue for a cautious approach.

Moreover, forceful policy is most appropriate when surprises are in aggregate demand. In such circumstances, output and inflation are moving in the same direction; with no short-run tradeoffs, vigorous policy is stabilizing in every respect. In effect, the staff forecast embodies such a shock, in which unanticipated strength in aggregate demand has pushed the economy past its sustainable potential. Recent favorable inflation outcomes are seen, in part, as the consequence of temporary factors that are likely to dissipate, as Dave Stockton discussed. This

is what gives the payoff we saw in the first set of simulations from prompt policy actions, and would be the rationale for an immediate tightening, as in alternative C.

Such a response might not be appropriate if the surprises are more on the supply side of the economy. Supply shocks do entail tradeoffs, in which policymakers might well choose more restrained actions that take some of the surprise in prices and some in output. Dave's briefing modelled a favorable productivity surprise in which the Committee could realize some combination of lower inflation and higher production. The bluebook showed an exercise in which NAIRU was 4-3/4 percent, and holding the funds rate locked in the current unemployment and inflation rates.

Thus, in formulating policy, differentiating among various types of shocks is essential, but this can be quite difficult as events unfold. Key uncertainties at this time surround the relationship of output to prices--whether or to what extent there has been a favorable shift in the economy's aggregate supply. The combination of an upside surprise to output and shortfall in inflation in the first half of this year does suggest the possibility of a favorable supply shock, rather than a shift in demand.

In these circumstances, the Committee may view recent data as at least justifying maintaining the "wait and see" posture of alternative B to assess the current situation. It may view data on actual prices and the absence of most early signs of pressures

on margins and prices, as increasing the possibility that the economy is not producing appreciably beyond its potential. Moreover, slowing final demand may suggest that the expansion is moderating enough to hold the economy at its present level of resource utilization, limiting any buildup of inflation pressures that may be occurring. Finally, with inflation already quite low, the Committee may see the gains from further disinflation as sufficiently small to take a bit of a chance on the economy being able to sustain the current high operating level.

But, as I noted, identifying the type of shock is problematic in real time. Prices usually lag output, and movements or surprises in prices and economic activity over a relatively short interval--such as the first half of this year--may not be unambiguous indicators of the underlying situation. The size of the decline in the unemployment rate and the degree of strength in output may suggest that at least some of the first-half performance reflected a positive demand surprise that threatens to outpace any lasting upward shift in sustainable supply. Any such increases in long-term supply are likely to occur relatively slowly if they are the result of a pick up in productivity trends that are just becoming visible in the data, or of more flexible product and labor markets.

Consequently, even if the Committee believes the staff has not fully taken into account the implications of the recent good price performance, it may see the risks still as tilted toward higher inflation. If so, at some point it may wish to consider

further tightening, even before it sees convincing evidence of accelerating prices. If demand has overshoot potential, as the simulations showed, the longer corrective action is delayed, the more difficult the adjustment is likely to be. So long as the Committee saw this to be a distinct possibility, and the incoming data weren't contradicting this hypothesis, a gradual, occasional firming might be one possible approach, which ensured against cumulating inflation pressures. A view that higher inflation remained the major risk to the economy, and one that was serious enough to potentially warrant Committee action before too long, could be reflected by retaining the asymmetrical language of the directive.

And that brings me to my final subject. The bluebook suggests Committee consideration of the changes in the wording of two sentences in the operational paragraph of the directive, which are shown on page 31. In the first sentence, the alternative would make explicit your expectations for the funds rate-- something you now do in public announcements of policy changes. We propose retaining the language that indicates that you work through reserve markets to the federal funds rate, rather than simply giving a funds rate target. This is an accurate description of the process, and avoiding the implication that the Federal Reserve controls the federal funds rate absolutely and directly might be especially helpful if that rate becomes more variable with the drop in reserve balances.

The second suggestion involves the sentence dealing with intermeeting changes in the reserve conditions and the funds rate. No changes are proposed for the preamble of the sentence, which describes the background against which any such decision should be made. But we do give possible alternative wording for the part of the sentence that establishes symmetry or asymmetry. The alternative drops the would/ might and slightly/somewhat distinctions, which the Committee has been making less use of in recent years. In addition, in framing the symmetry/asymmetry language we tried to give a sense of what this might mean in the context of considering an intermeeting policy adjustment. Specifically, it seems to imply something about how incoming information is weighed. For example, an unexpected pickup in consumer prices might be more likely to trigger consideration of action if the Committee were already concerned about the risks that inflation would rise. We recognize that various members interpret this part of the directive differently, that no intermeeting adjustment has been made for some time, and that we may feel a certain kinship with Pandora before the discussion proceeds very far. Indeed, the Committee has lived for some time with the "constructive ambiguity" of the current wording of this sentence, and may prefer to continue in this mode.