PRESENTATIONS

ECONOMIC FORECAST

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U.S. Short-Term Outlook

Recent Developments

The Producers Price Index (PPI) for finished goods fell 0.2 percent in July. Following the 0.3 percent fall in June, the PPI numbers indicated that inflation remains under control. Energy prices, which fell 0.4 percent, and food prices accounted for much of the fall. Prices for finished consumer goods, however, fell 0.1 percent, indicating that consumer price inflation will likely remain moderate in the next few months.

The Consumers Price Index (CPI) rose only 0.1 percent in July. For the 12 months ending July, the consumer prices increased a moderate 2.8 percent, indicating that consumer price inflation remains under control. The core index (consumer prices less food and energy) also rose 0.1 percent, indicating that the moderate price movements are broad-based, and not the result of special circumstances. Prices of consumer services continued to rise more quickly than the average at 0.2 percent, while commodity prices were unchanged in July.

The merchandise trade deficit jumped to $12.1 billion dollars in June, a rise of $3.7 billion from May. There was no silver lining in the bad news: imports were up, and exports down, in all categories. Although such high import levels are unsustainable, this release sends a clear message that net exports will hurt economic growth until foreign economies turn around.

The August employment survey provided more bad news about the economy. The fall in the unemployment rate was entirely due to a 400,000 rise in household employment, which seems likely to be an artifact of the survey. Meanwhile, the more reliable establishment survey recorded falls in goods producing employment, including construction and manufacturing, and only a slight rise in service producing employment. Even the usually reliable retail trade sector, which has been good for 50,000 additional jobs per month this year, recorded no increase in employment. Hours and earnings did rise, but, if the economy does not resume creating new jobs, economic growth will remain painfully slow.

Industrial production rose a disappointing 0.4 percent in July, after falling, according to revised estimates, in May and June. Heavy electricity use because of hot weather in July pushed the utilities index up 3.3 percent, while the manufacturing index rose only 0.2 percent. The manufacturing rise was concentrated entirely in durable goods, despite a fall of 2.1 percent in automobile products. Low auto inventories will likely push up auto production in the future, but manufacturing prospects remain worrisome in light of the lack of growth in production registered so far this year.

Factors Weakening Growth

Defense Spending

Cuts in defense spending will hurt growth over the next several years. (Figure 1) Though the current Deficit-Reduction Bill allows for some leeway in discretionary cuts, the ax will fall hardest on defense spending. WEFA estimates that, from a baseline of 2 percent real growth in defense spending, about 400,000 defense-related jobs per year will be lost, given the outlook for 6 percent real declines in defense spending.

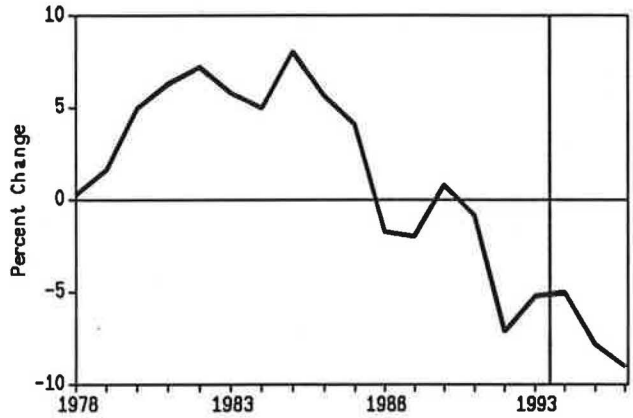

FIGURE 1 Real defense spending.

Tax Increases

The deficit reduction plan includes a number of tax increases. Personal income tax rates have been raised on the upper income groups retroactive to January of this

year, more Social Security benefits will be taxable, all wage and salary income will be subject to the 2.9 percent Medicare payroll tax (currently only pay below $135,000 is subject to this tax), the gasoline tax will increase 4.3 cents in October, and the corporate tax rate was raised 1 percentage point to 35 percent, retroactive to January 1, 1993. These tax increases are not going to help the economy to grow in the short run. However, it is worthwhile to put these tax increases into perspective. Figure 2 shows the personal effective tax rate over the past thirty years. The currently legislated personal tax increases are very mild by historical standards. In fact, they will simply force the retracing of a fall in the effective rate from 1989 to 1992 due to the shifting of income from highly taxed to lower taxed types of income. The gasoline tax is unlikely to be noticed by consumers. It is not large, and falling oil prices will counteract much of the impact on retail gasoline prices. The Medicare payroll tax will only affect the 2 percent of the working population with wage and salary income over $135,000 per year. Finally, the corporate tax increase is small. It is expected to raise receipts by about $4 billion per year, capturing about 1 percent of before-tax profits. Thus, though the tax increases will not help the economy to grow, they are not a severe constraint on economic activity.

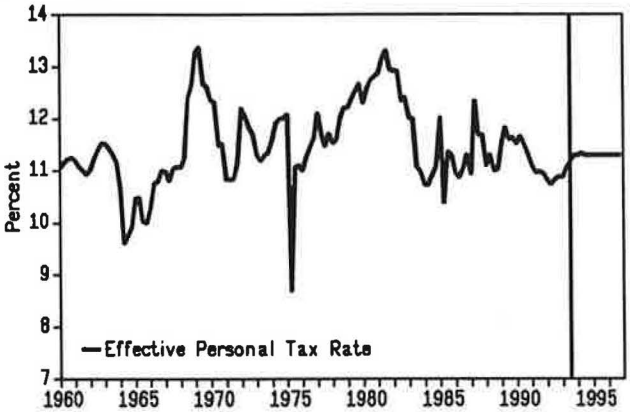

FIGURE 2 Effective federal personal tax rate.

Exports

Except for the United Kingdom, the major economies of Western Europe are still in recession. This is apparent from recent U.S. export performance to Western Europe. Through June, U.S. merchandise exports to Western Europe are down 4.3 percent and in June stood 10.2 percent below the year-ago level. Export performance to Western Europe has been worsening as the year progresses. This weakness is probably best displayed by the deteriorating performance of U.S. exports of industrial supplies and materials which fell 5.4 percent in June from the same period in 1992. This category which has a broad range of industrial uses is experiencing falling demand due to the retrenchment in industrial output in Europe. Exports to Western Europe account for over 20 percent of total U.S. exports and probably are the most pervasive factor behind the weakness in a broad cross-section of U.S. industries.

The view that the Japanese economy has bottomed out appears to be supported by U.S. export statistics. Exports to Japan are up 1.0 percent through June over the same period last year and rose 4.3 percent in June from the year-ago level. However, some of this increase could be attributable to the surging yen against the dollar, lessening U.S. import prices in yen terms and making U.S. goods more competitive. Other weakness in U.S. export performance is seen in the year-to-date decline of 14.3 percent to OPEC, primarily due to the completion of Kuwait's rebuilding efforts. Exports to the NICS of Southeast Asia are still strong, up 7.7 percent through June. However, the stellar performance of U.S. exports to Mexico and the rest of Latin America witnessed in 1991 and 1992 is dissipating. During most of 1992, exports to Mexico were rising in excess of 20 percent from the same period a year-ago which offset the weakness in U.S. exports to the major industrialized nations. However, U.S. exports to Mexico and the rest of Latin America are up only 4.5 percent through June. The greatest success story for U.S. exports in 1993 is Canada, where exports rose 11.7 percent in the first half of 1993.

Rest-of-World Growth

There is now growing concern that Japan may be entering the second leg of recession with most recent readings on the economy displaying weakness. Many economists believe the Japanese economy contracted in the second quarter. Industrial production fell 0.3 percent in July from June and declined 4.5 percent from a year ago. Retail sales have now fallen in every month in 1993 from the previous years' levels; June witnessed a decline of 4.8 percent. Department store sales were down 6.2 percent in July from the same period last year. Even taking the unusual cold and rainy weather into account, the numbers were disappointing. Housing starts were one of the few positive statistics, rising 4.1 percent in June from last year.

Many economists are projecting that the Japanese economy will not hit bottom until late 1993 or early 1994. The 20 percent rise of the yen against the dollar this year is curtailing exports and hammering corporate

profits. Many Japanese manufacturing firms cannot compete with the yen at this level. Highly respected economists are now calling for a cut in interest rates below 2 percent and a new fiscal stimulus package to be implemented.

Germany's second quarter GDP figures are widely expected to rise at an annual rate of 2.0 percent. This is the first sign that the German economy has reached bottom. New orders are improving and industrial production has risen in recent months. The new data indicate that the German economy will decline near 1.5 percent during 1993. However, even as growth prospects seem to be improving in Germany, gloom is spreading throughout the rest of continental Europe. It was widely anticipated that the widening of exchange rate bands within the ERM would permit more accelerated interest rates cuts to promote growth. So far, European nations have not used their new-found monetary freedom to cut rates more aggressively. The authorities remain concerned that a more bold reduction in interest rates might cause a new run on their currencies. European nations will probably wait for the Bundesbank to initiate the next round of rate cuts, hoping they will be shielded from speculative pressure on their currencies. This will postpone the greatly anticipated stimulus from lower interest rates. The first installment payment was delivered by the Bundesbank on September 9 when it cut the discount rate and Lombard rate by 50 basis points. Modest decreases in rates followed across Europe. Nevertheless, the easing was substantially less than the full one percentage point that many European economists were calling for.

The forecast for the trade-weighted rest-of-world real GDP index has not been revised since last month. WEFA still expects growth in the second half of the year of 2.8 percent. Given the renewed concern about weakness in Japan and the postponement of interest rate cuts in Europe, we will be reviewing our projections for rest-of-world growth next month. Rest-of-world real GDP is expected to rise 1.5 percent in 1993, 3.1 percent in 1994, 3.3 percent in 1995, and 3.1 percent in 1996.

Imports

Import growth has been particularly strong for the past year and a half. The strength has centered on capital goods, primarily computer equipment, but also industrial equipment. Typically, imports grow at about twice the rate of U.S. income growth. In 1992, however, real GDP grew by 2.6 percent and imports grew by 8.7 percent — more than three times the rate of income growth. Figure 3 shows why import growth has been so much higher than real GDP growth. The share of imported capital

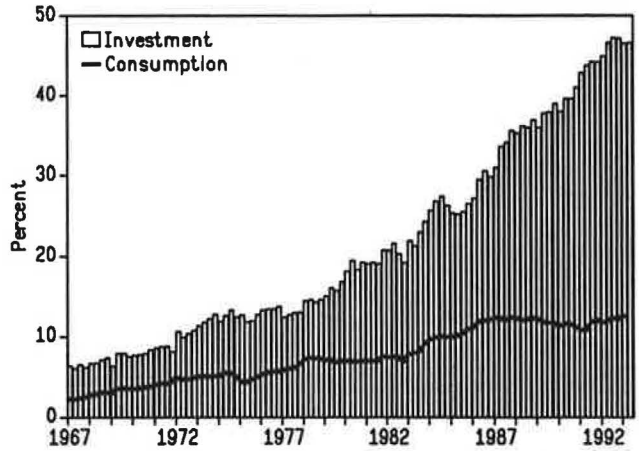

FIGURE 3 Import share investment and consumption.

equipment, including computers, has been rising rapidly. The strong growth in equipment investment — which grew by 6.9 percent in 1992 — is driving the abnormally high import growth. In addition, Japan and Germany, two of our major trading partners, remain in recession as Figure 4 indicates. Thus, real net exports will continue to be a drag on growth over the next year.

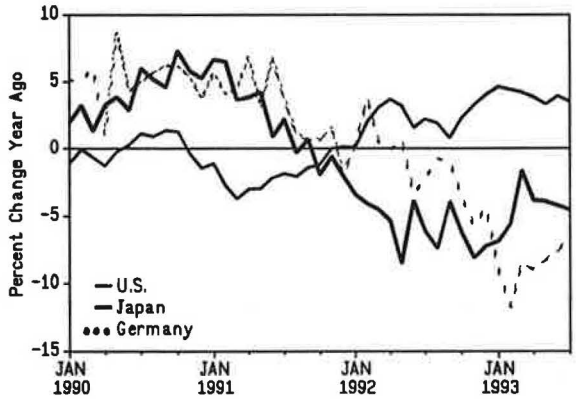

FIGURE 4 Industrial production: U.S., Japan, and Germany.

Commercial Construction

Vacancy rates, particularly for commercial structures, remain at very high levels. (Figure 5) This will continue to dampen construction of commercial buildings for some time. (Some analysts estimate it will take about five years). Although this is discouraging news, other areas of construction have finally begun to pick up the slack. For the past two quarters, real business fixed investment in structures has risen modestly. We expect no boom in this sector, but at least it appears to have

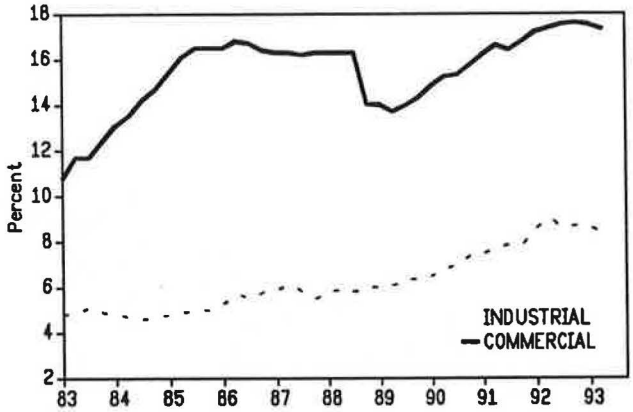

FIGURE 5 Vacancy rates.

bottomed-out and will no longer be a significant drag on overall growth.

Health Care Reform

It is very difficult to quantify the impact of health care reform on growth. However, the discussion of major reforms is creating enough uncertainty that some business decisions are probably being postponed. Until we know the specifics of health care reform, this uncertainty will restrain growth. If implemented properly, the health care reforms could alleviate some of the pressure on the government and private sector from rising health care costs. Figure 6) Reducing health care costs to the private sector would help to make U.S. business more competitive by lowering unit labor costs. It could also help to reduce future government deficits, by lowering Medicare and Medicaid expenditures. The Clinton Administration is now trying to construct a plan which primarily emphasizes reducing health care costs,

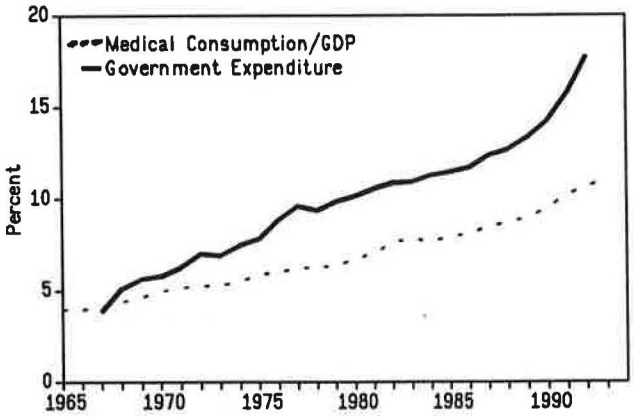

FIGURE 6 Medical expense shares.

rather than providing coverage for the uninsured. Theoretically, the large savings from cost reduction should be sufficient to support universal coverage, reduce the cost of health benefits to business, and lower Medicaid and Medicare expenditures. Realizing and capturing those potential health care savings, however, promises to be difficult.

Factors Fostering Growth

Low Interest Rates

As Figure 7 indicates, low interest rates tend to be correlated with high real GDP growth. The growth is primarily stimulated through increased business and residential investment. Auto sales and consumer durable purchases also tend to be influenced by low interest rates. In the current recovery, constant dollar business investment in equipment has responded strongly to low interest rates, growing by 14.7 percent from the second quarter of 1992 to the second quarter of 1993. Light vehicle sales are up 10.0 percent over the same period, while housing starts rose 8.8 percent and existing home sales rose 5.0 percent. Housing starts and home sales are very supportive of consumer durable purchases. After buying a home, the typical home buyer purchases furniture, appliances, carpeting, curtains and other new amenities, boosting consumption.

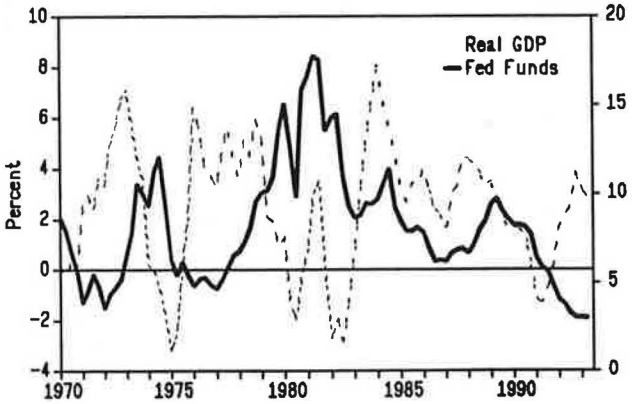

FIGURE 7 Real GDP growth and FED funds rate.

Though housing starts are rising, compared to previous recoveries growth in residential construction has been modest. (Figure 8) Instead, existing home sales seem to be responding much more robustly to the low mortgage rates. Existing home sales have reached a level comparable to the late 1970s, but housing starts are still far from their 1980s peak of 1.81 million units in 1986. The overbuilding of multifamily units in the 1980s ex-

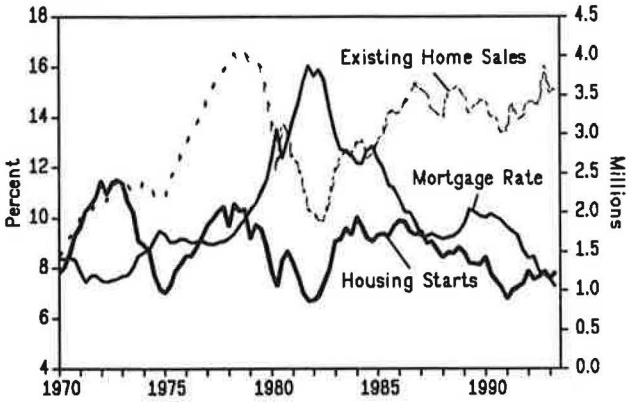

FIGURE 8 Housing starts, home sales, and mortgage rates.

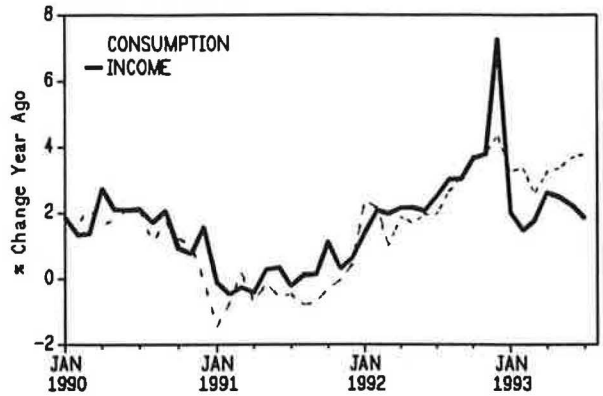

FIGURE 9 Real consumption and income growth.

plains much of the lack of a housing construction rebound. In 1986, single family starts accounted for 1.18 million units, while multifamily units accounted for 0.63 million units. So far this year, single family housing starts have averaged 1.05 million units per month, but multifamily units have only averaged 0.15 million starts. WEFA analysis indicates that much of the excess supply of housing has been sold off and, as a consequence, the housing recovery is expected to continue. However, because the weakness has been pervasive this year, our housing start forecast has been lowered this month, particularly for the remainder of 1993.

Consumption

Consumption continues to be strong, despite fairly anemic income gains. Real consumption in July was up 3.8 percent compared to July, 1992. Real disposable income grew only 1.8 percent over the same period. (Figure 9) (The large spike in income is due to the early payout of bonuses before the 1993 tax year.) This large discrepancy between consumption and income is typical in a recovery cycle. In the 1983 recovery, the percent change in consumption, compared to a year ago, outstripped income for 17 months in a row. Extra consumption over income is to be expected when many consumers are new home buyers, stretching themselves to make purchases to complement their new house. Also, many vehicles are being purchased these days to replace the aging fleet on the road. The entire value of these purchases is recorded as consumption in the quarter they are purchased, even though the payments are spread out over several years.

Another possibility, of course, is that the data are simply misleading and erroneous. Perhaps next year, when the income and consumption numbers for 1993 are revised, consumption and income growth will be closer together. The revisions for 1992 pushed nominal disposable personal income up by $69 billion, but revised consumption upward by only $44 billion, resulting in an improvement to the savings rate from 4.8 percent to a revised 5.3 percent.

Employment

Finally, it is worth pointing out that employment growth has generally been positive for the past 17 months. (Figure 10) Occasionally — as in August — it has slowed down, but so far in 1993, employment growth has been much better than in 1992. In addition, weekly claims for unemployment insurance have also been modest compared to this time last year. Last summer, weekly unemployment insurance claims averaged about 412,000. This summer they averaged about 341,000, implying a lower level of layoffs. Employment is up, layoffs are down, the unemployment rate has been dropping, and

FIGURE 10 Employment growth.

inflation and interest rates are down. These factors explain some of the strength in consumption, despite reported weak income gains and weak consumer confidence.

Which Way Growth?

Many indicators show weakness in the economy. Certainly, the manufacturing sector is not showing signs of strength and manufacturing employment dropped another 42,000 in August. Also, the NAPM index has been below 50 for the last three months, indicating the manufacturing sector is contracting. Defense cuts continue, tax increases are on the horizon, imports remain strong while our trading partners are weak, vacancy rates are high and health care reform is creating uncertainty for business. On the other hand, interest rates are low, stimulating business investment and a modest housing recovery. Perhaps most significantly, employment growth — though off in August — has been fairly strong for much of 1993, fueling consumption. In our latest economic outlook, real GDP growth is expected to be lower in the last two quarters of 1993, averaging closer to 3.5 percent than to the 4 percent in last month's forecast. This revision is primarily due to a weaker outlook for housing starts, which have been marked down significantly in the current forecast.

Revisions to History: 1992 Stronger, 1993 About the Same

Perhaps the most striking feature of the NIPA revisions was how much strength the economy had in 1992. (Figure 11) In each of the four quarters of 1992, real GDP growth was close to, or above, 3 percent. From the fourth quarter of 1991 to the fourth quarter of 1992, real GDP grew by 3.9 percent — previously, this period had been estimated to have grown by only 3.1 percent. At the time, the economy did not seem particularly strong — consumer sentiment was as weak as it is today, employment was not rising, and industrial production gains were modest. In fact, last year seemed much like the economy seems today — growing, but with much hesitancy.

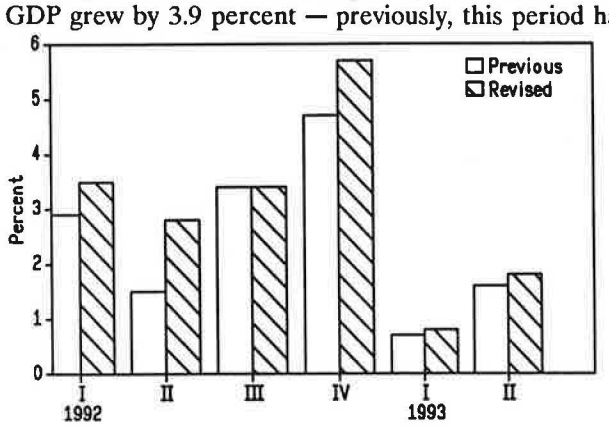

FIGURE 11 Real GDP growth: previous and revised.

Forecast Highlights

Real GDP

Consumption spending grew fast in July, suggesting that real GDP will show some strength in the next few quarters. WEFA predicts that GDP will grow 3.1 percent in the third quarter of 1993, and 3.4 percent in the fourth quarter. Growth will reach about 3 percent for the next three years as consumer demand and investment spending slow, but net exports start to contribute to growth by 1996. The somewhat weaker growth in the second half of 1993 than in last month's forecast is caused by a lower housing forecast.

Consumer Activity

Real consumer spending grew at a 20 percent annual rate in July, indicating that the third quarter of 1993 will show some strength. WEFA forecasts a 3.3 percent rise in consumer spending in the current quar-ter, slowing to a 2.7 percent rate in the fourth quarter of 1993. Consumer spending will then rise at 3.0 percent in 1994 and 1995, and slow to 2.7 percent in 1996.

Housing

The failure of housing to respond to this year's interest rate decline has caused WEFA to revise our housing forecast. Housing starts are now forecast to grow from an average of 1.23 million in 1993 to 1.48 million in 1996, for 40 thousand fewer starts this year and 70 thousand fewer starts next year than in last month's forecast. The failure of housing to respond to the interest rate decline of 1993 is now an important factor in preventing strong economic growth during this recovery. Residential investment is now forecast to grow 11.6 percent in 1994, decelerating to 5.0 percent in 1995 and 4.0 percent in 1996.

Investment

Indications are that business fixed investment, especially equipment investment, will continue to grow very quickly

in the near term. We expect investment in producers' durable equipment (PDE) to slow to an 9.5 percent pace in the current quarter, down from the second quarter's 17.4 percent growth, for an annual growth rate of 14.9 percent. PDE investment growth will then slow to an 11.8 percent rate in 1994, 9.2 percent rate in 1995, and 8.0 percent growth rate in 1996. Although investment in non-residential structures grew 6.4 percent in the second quarter, high vacancy rates suggest that this level of growth will not be sustained. Investment in non-residential structures will grow 1.7 percent per cent in the current quarter, and -0.1 percent in 1993, rising to rates of 2.8 percent in 1994, 3.7 percent in 1995, and 4.8 percent in 1996.

International Trade

The reform of the ERM will allow the currencies of several important trading partners of the United States to fall in the near-term. WEFA's exchange rate forecast has therefore been revised upward about 2 percent in the next few years, leading to slower export growth and faster import growth than in last month's forecast. Imports are now forecast to grow 9.0 percent in the current quarter and 10.1 percent in the current year, slowing to 8.9 percent in 1994, 7.7 percent in 1995, and 5.8 percent in 1996. We expect export growth to remain slow, at 4.7 percent in the current quarter, and 3.6 percent for 1993, then accelerate to 6.0 percent in 1994, 7.6 percent in 1995, and 7.9 percent in 1996. In 1994 the real net export deficit will total $98.7 billion, rising to $107.1 billion in 1995, and falling to $98.6 in 1996.

Labor

Employment will continue to grow at an average rate of about 200,000 per month. Total employment will average 110.3 million in 1993, rising to 112.7 million in 1994, 115.1 million in 1995, and 117.5 million in 1996. The unemployment rate will fall slowly from 6.9 percent in 1993 to 6.5 percent in 1994, 6.4 percent in 1995, and 6.3 percent in 1996.

Inflation

WEFA's view of the underlying rate of inflation remains similar to last month's. We expect the GDP deflator to accelerate slightly from 2.9 percent in 1993 to 3.3 percent in 1994 and 3.4 percent in 1995 and 1996. The CPI will also accelerate from 3.2 percent in 1993 to 3.3 percent in 1994, 3.6 percent in 1995, and 3.9 percent in 1996.

Interest Rates

The Fed is now assumed to start raising short-term interest rates in February, after better economic news gives it some room to maneuver. The Fed funds rate is forecast to average 3.0 percent for 1993, rising gradually as the Fed tightens monetary policy to 3.3 percent in 1994, 4.0 percent in 1995, and 4.7 percent in 1996. Faster economic activity will also start to push up long- term interest rates. The 30-year Treasury bond rate will average 6.6 percent in 1993, 6.3 percent in 1994, 6.7 percent in 1995, and 7.0 percent in 1996.

U.S. Long-Term Outlook

There are key differences in the methodologies employed to forecast short-run and long-run economic activity. Short-run economic analysis focuses on issues related to fluctuations in the level and composition of final demands and incomes, while long-run analysis is concerned with expansion of potential output or aggregate supply. The growth of aggregate supply or potential output is the fundamental constraint on the long-run level of economic activity.

In an environment free of exogenous shocks we assume that equilibrating dynamics tend to cause productive capacity to converge to its potential or fully utilized level. Consequently, the briskness in the expansion of output, real incomes, real expenditures, and the general standard of living of the population are determined by the growth rate of potential GDP. The long-range outlook is dominated by supply factors such as population growth and demographics, labor force participation rates, weekly hours, capital stock accumulation, productivity growth, fiscal and monetary policies, foreign developments, and internationally determined prices.

Actual GDP has now been below potential since the first quarter of 1989. The 1990-91 recession included the two negative quarters in 1990 and the first quarter of 1991. This is the longest sustained below-potential stretch in the post-war period. This suggests that economic activity could rise for a substantial period of time before bumping up against physical and financial constraints.

WEFA estimates that actual U.S. GDP was 3.5 percent below its potential in the second quarter of 1993. This explains much of the reduction in inflation as resources in product and labor markets are highly underutilized. The United States is not alone in experiencing a GDP gap; all the G-7 countries are operating below their potential to one degree or another. In fact, with the recessions in Japan and Germany deepening, the GDP gaps in those nations are rising. Real GDP will grow at an average rate of 2.8 percent through 2000 as the output gap is reduced. After 2006, annual real GDP growth will decline to 2.5 percent, slowing to 2.1 percent by the end of the projection period.

The August revisions to the National Income and Product Accounts (NIPA) indicate that the economy expanded by roughly 0.5 percent more than previously believed in 1990, 1991, and 1992. Real GDP was $63.7 billion (1.3 percent) higher in 1992 than the previous estimate. This reduced the GDP gap, or the difference between actual and potential, and will limit the ability of the economy to grow between 1994 and 2002 as output will bump against effective supply constraints sooner.

Long-Term Forecast Assumptions

Population and Demographics

Population growth is a primary long-run determinant of the potential expansion path of the economy from both the supply and demand sides. The growth of the population and its composition have profound impacts on the labor force, demand for consumer durables (especially light vehicles) and housing, and demand for medical services. The WEFA Long-Term Service is basing its population projections on the Census Bureau's new middle series assumptions for fertility, life expectancy, and net immigration.

The Census Bureau released revised population and demographic projections last December. They have made significant upward revisions to fertility rates and net immigration. This resulted in a major increase in their population projections. The Census Bureau has now made their previous high series assumptions on immigration their middle series. Since WEFA was already using the Census Bureau's previous high series, this will not affect our population projections.

The upward revision to fertility rates did affect WEFA's population projections. We have reviewed the Census Bureau's assumptions and incorporated them beginning with our 1993 first quarter long-term outlook. The population projections are higher and resulted in an upward revision to the potential growth path of the U.S. economy.

U.S. population is projected to expand at an annual rate of 0.9 percent between 1992 and 2002, when the population is projected to reach 280.7 million. Population growth will taper off to an annual rate of 0.8 percent from 2002 to 2016, when population reach 315.1 million. (Figure 12) Population growth will not be distributed evenly over the population cohorts; growth in the older age cohorts will be stronger.

Productivity and Aggregate Supply

It is the economy's ability to increase supply in the long run which determines the potential growth path of the economy. Aggregate supply is dependent upon the increase in the labor force, the growth of the capital stock,

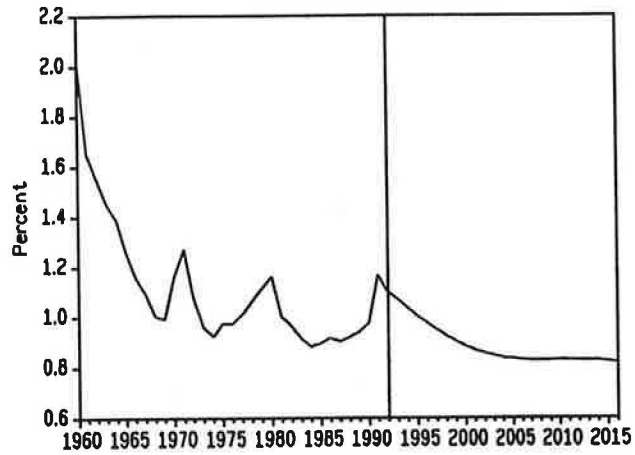

FIGURE 12 Population growth.

and productivity improvements. Potential GDP growth will slow in the projection period, expanding by 2.5 percent annually over the next decade and slowing to only 2.1 percent by 2016. This is in stark contrast to the potential growth path of the economy in excess of 3.0 percent that prevailed in the 1960s and has trended downward ever since.

The most comprehensive measure of productivity growth -- real GDP per employee — should grow an average of 1.2 percent per year over the 25-year projection period. Output per hour in the nonfarm, private business sector is forecast to increase 1.5 percent annually over the 1992 to 2016 time frame. The 1960s witnessed stellar growth in output per man-hour averaging 2.4 percent per year. Productivity growth collapsed in the 1970s and 1980s, averaging only 1.2 percent during that period. WEFA believes productivity growth will quicken somewhat in the future. (Figure 13).

There is evidence to suggest that the productivity performance of the U.S. economy is improving relative to the recent past. A great deal of attention has been focused on the slow employment growth in this recovery,

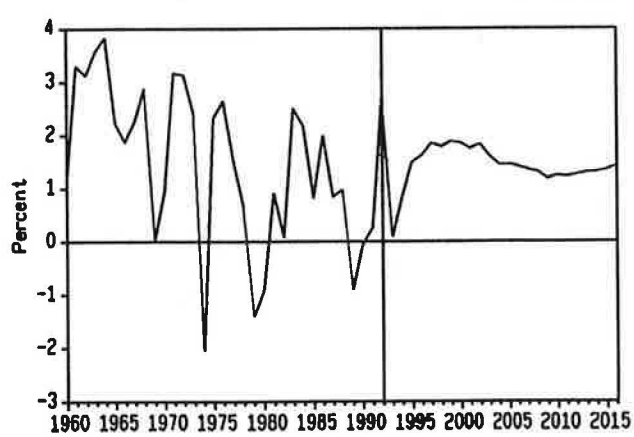

FIGURE 13 Productivity growth: output per hour.

although recent upward revisions show that it was not as bad as initially believed. However, the corollary to the weak job performance is a discernable improvement in productivity performance. Output per man-hour in the nonfarm business sector rose 2.7 percent in 1992, the highest performance in nearly 20 years. Due to the August NIPA revisions, it is likely that productivity growth in the nonfarm business sector will be revised to show an increase near 3.0 percent for 1992.

It is clearly premature to conclude that long-run productivity growth is recovering based on the limited number of observations. Nevertheless, there are other developments which bolster the case for a fundamental improvement in productivity growth. First, productivity growth in the manufacturing sector has averaged a solid 2.8 percent since the early 1980s — approaching the 3.2 percent average prior to 1973. Second, though service sector productivity was weak for most of the 1980s, it grew an estimated 2.6 percent in 1992. Finally, there is also evidence of a turnaround in the disaggregated service sectors where the Bureau of Labor Statistics believes it can more reliably measure productivity.

Although it is not yet certain that productivity growth will improve during the 1990s, the recent evidence supports an optimistic outlook, given the likely improvement in service sector productivity and continued manufacturing productivity growth.

Government Policy

The share of GDP flowing through the government sector will decline over the forecast period as taxes rise and spending will be slowly reigned in to reduce the size of the budget deficit. Total government purchases (including state and local) as a share of real GDP will decline from 19.0 percent in 1992 to 15.5 percent by 2002, and 14.5 percent by 2016. (Figure 14) This reduction in the government's share of the economy is concentrated in the federal sector. The shrinkage in federal spending as a percent of real GDP will be attributable to a declining defense share, a contraction in the federal interest payments share, and a slowing in the rate of increase in transfer payments. President Clinton believes it is necessary to reconfigure the military for the post-Cold War world. The scaling back of the U.S. defense posture will result in an average annual decline in real defense purchases of 4.9 percent between 1992 and 2002. This will reduce defense's share of real GDP to only 2.9 percent by 2000.

The federal budget deficit is projected to peak in 1992 at $276.2 billion on a NIPA basis and at $290.2 billion on a unified basis. Beyond 1992, the federal budget deficit will begin a gradual improvement as a result of an

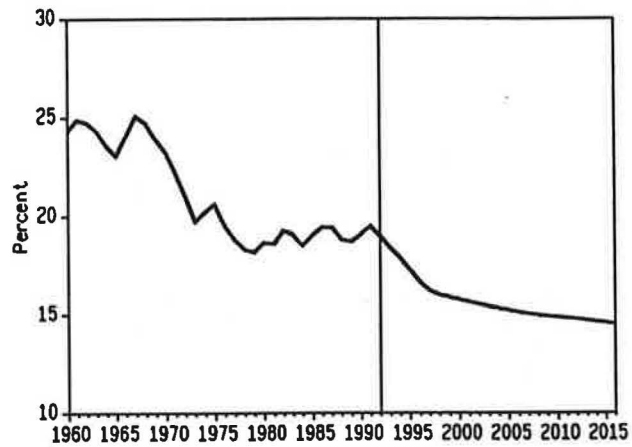

FIGURE 14 Government share of GDP.

increase in the average tax rate and spending restraints. On a NIPA basis, the deficit is gradually reduced and moves to a slight surplus in 2004. We are aware that deficit projections are inherently political rather than economic forecasts. Our projections are predicated on a belief that the public will not accept an escalating debt--GDP ratio indefinitely. Pressure will mount on politicians to take serious action to correct this long-run restraint on growth. This currently appears to be happening inside the Beltway.

Monetary and Financial

The Fed will pursue a monetary policy which maintains a vigilance against inflation and provides sufficient monetary aggregate growth to ensure output gains. A stricter monetary regime would lead to lower inflation, but at the expense of lost output. In order to achieve the "zero inflation rate" that some members of the Federal Reserve Board are advocating, it would require deflation in goods markets to offset rising prices in services in such areas as health care. The outlook for interest rates is tied to long-run inflation performance. Short- and long-term rates will rise modestly during the recovery period through the mid-1990s. (Figure 15) The recovery will mature by 2002, as actual GDP growth slowly recedes to its potential, permitting the Fed to gradually reduce rates in the long-run. The yield on the 30-year Treasury bond is projected to remain in a narrow range, peaking at 7.3 percent in 1999. Thereafter, it will begin a long-term descent to 6.4 percent by 2016. Real long term interest rates will decline from the 4.0 percent plus levels of recent years to near 2.8 percent by 2016.

Oil Prices

Real oil prices are projected to rise throughout the forecast period. (See Figure 16). Real oil prices in 1987

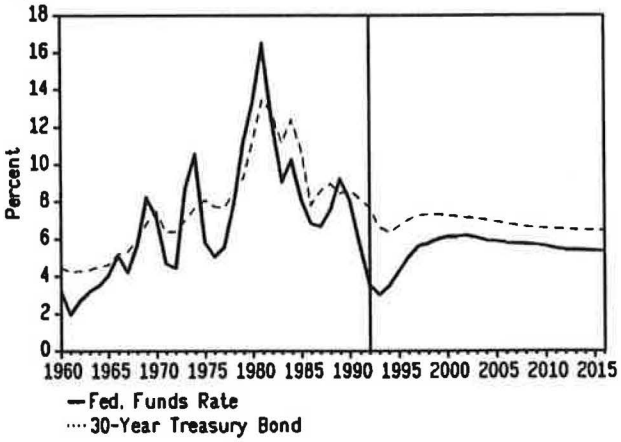

FIGURE 15 Short- and long-term interest rates.

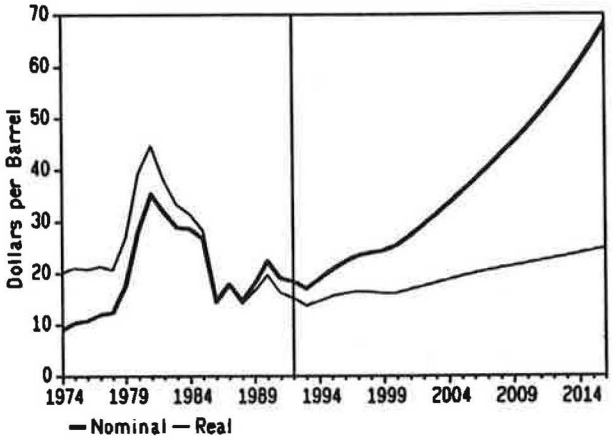

FIGURE 16 Refiners' acquisition cost of crude oil.

dollars are expected to rise 2.2 percent per year through 2016. The refiner's acquisition price for oil is projected to reach $68.19 by 2016, but only $24.70 in real terms. U.S. oil production will decline by 2.0 percent annually in the long-term and other non-OPEC reserves and production will fall increasing OPEC's market power. If conservation efforts intensify and further substitution away from oil occurs, this projection will be too high. This alternative is evaluated in our high growth scenario.

Foreign Assumptions

WEFA maintains a foreign real GDP index based on the bilateral trade weights used in the Morgan Guaranty dollar measures by applying them to the United States' largest 15 trading partners. Foreign GDP growth will outstrip U.S. growth over the forecast period as developing nations' output grows faster than U.S. output. Convergence of productivity levels between the United States and the rest of the world will play a key role. Foreign growth will decelerate near the end of the projection period due to slower population increases. Nevertheless, foreign GDP grows by 0.5 percent greater than U.S. GDP growth through 2016. As foreign demand improves faster than U.S. demand, this will benefit U.S. export growth.

The Dollar

On the basis of the real Morgan Guaranty index of 15 trade-weighted currencies, the dollar fell 28.6 percent between its 1985 peak and 1991. We believe the bulk of the depreciation of the dollar is behind us. However, in order to service the interest payments on the debt we owe foreigners and reduce the current account deficit, the dollar must decline further. Many economists point to purchasing power parity theory which indicates that the dollar is undervalued by as much as 50 percent. This suggests the dollar may rise. We concede that the dollar may indeed rise at some point after the current account is eliminated. However, until that is accomplished it seems unlikely the dollar will rise. We are projecting the dollar to decline by an additional 15.3 percent between 1992 and 2016. (Figure 17)

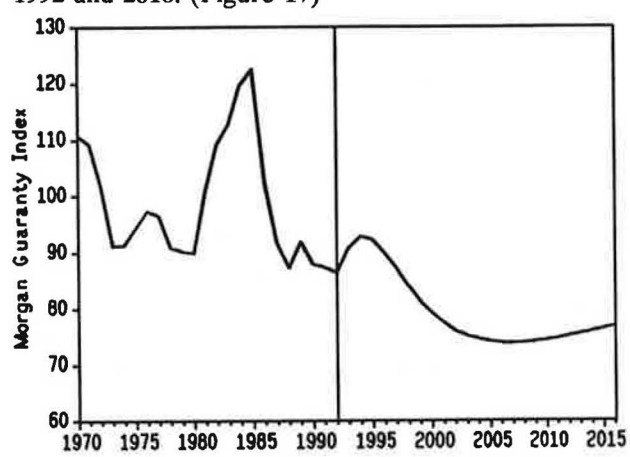

FIGURE 17 Value of the dollar (1980–82 = 100).

Long-Term Forecast Highlights

Real GDP

Real GDP will expand at a rate above its potential until 2002. Actual GDP is currently 3.5 percent below its potential and this gap will be closed. Between 1992 and 2002, real GDP growth will average 2.8 percent per year. After 2002, real GDP growth will average 2.4 percent, with growth tapering off to 2.1 percent near the end of the projection period. (Figure 18) Slower population

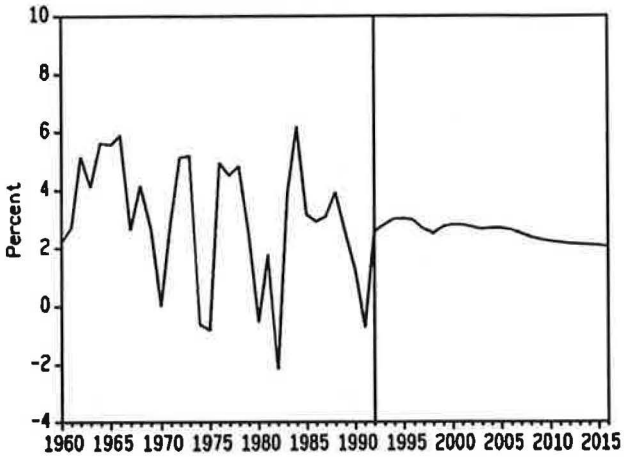

FIGURE 18 Real gross domestic product.

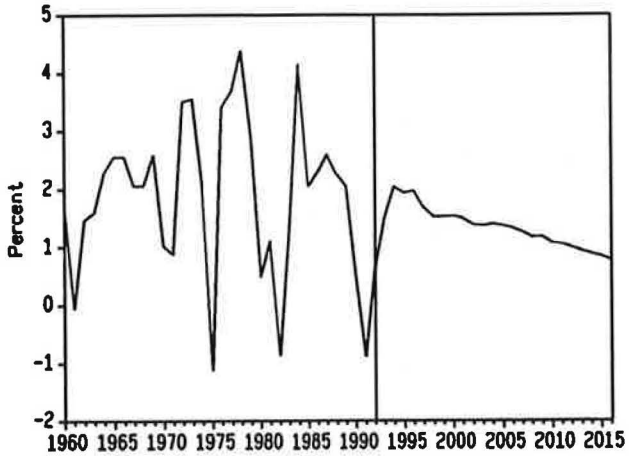

FIGURE 19 Civilian household employment.

growth and its attendant lower labor force growth will reduce the potential expansion path of the economy. This will be partially offset by greater productivity growth.

Employment

Slower increases in the labor force mean that employment growth will moderate in the future. Total civilian household employment will rise at an average annual rate of 1.7 percent from 1992 to 2002, and moderate to a growth rate of 1.1 percent in the rest of the forecast period. (Figure 19) Total establishment employment will rise by 43.6 million from 1992 to 2016, an increase of 40.2 percent. The cumulative increase in employment between 1965 and 1990, another 25-year period, was 49.1 million, an astonishing gain of 80.9 percent. Manufacturing's share of total employment will continue to decline over the forecast period, falling to 11.4 percent in 2016. The service sector will generate an increasing share of employment growth in the forecast period, accounting for 83.0 percent of employment growth from 1992 to 2016.

Inflation

The outlook for inflation in the long-run faces a great deal of uncertainty. Inflation performance has improved in recent years after the two OPEC induced oil price shocks. WEFA believes inflation rates will stabilize in the long-run at a rate near 3.6 percent. (Figure 20) There is excess capacity in many commodity and primary processing industries in the world. This will act to place a ceiling on long-run inflation. The absence of a major exogenous shock, such as an another oil price crisis,

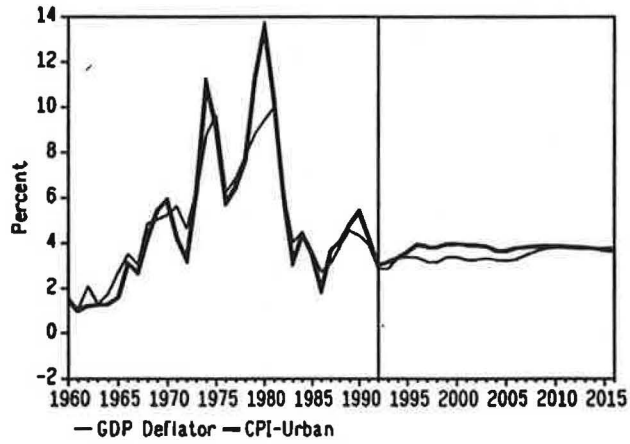

FIGURE 20 Measures of inflation.

should permit inflation to remain in check. In the long-run, inflation is primarily under the control of the central banks, which have become more committed to controlling inflation with many policy makers advocating a "zero inflation rate" as a long-term goal.

Consumption

Consumption expenditures are primarily predicated on the growth of real permanent income, demographic influences, and changes in relative prices in the long-term. The share of personal consumption expenditures relative to GDP will decline over the forecast interval. Consumer spending as a share of GDP peaked in 1986 at 67.4 percent after averaging about 63 percent over much of the post-war period. Consumption's share of aggregate output will decline to 65.0 percent by 2002 and 62.8 percent by 2016. Consumption expenditure

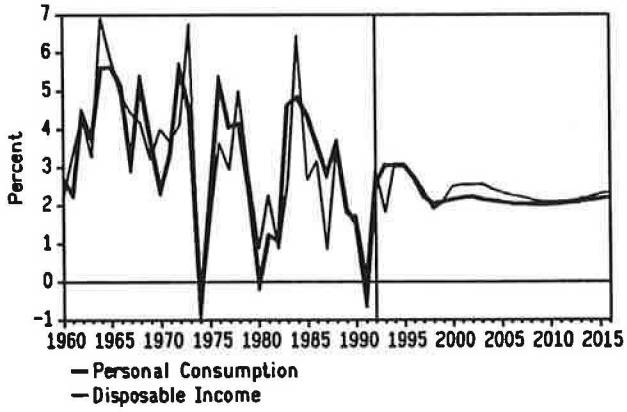

FIGURE 21 Personal consumption and disposable income.

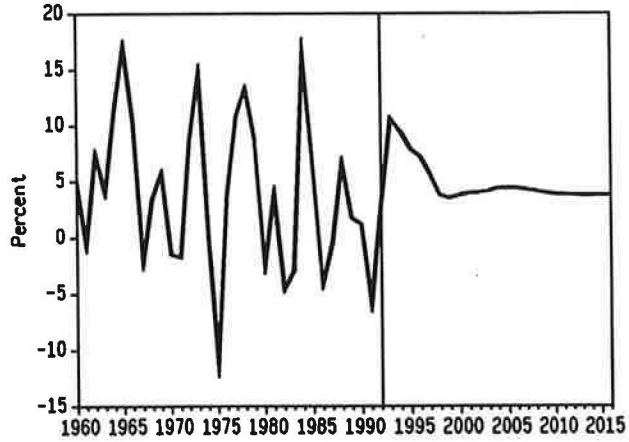

FIGURE 22 Business fixed investment.

growth will slow to 2.2 percent in 2002 and trends down to average annual increases of 2.1 percent near the end of the forecast period. (Figure 21). The share of consumption devoted to services will rise in the forecast while it falls for nondurable goods. The long-term outlook for auto and light truck sales is for a slowdown in the rate of increase relative to the past. Growth averages 0.8 percent in the long-term. Light vehicle sales will hit 19.4 million units by 2016. A key restraining factor for light vehicle sales in the long-term is that the United States is approaching a saturation point in the ownership rate of vehicles.

Business Fixed Investment

The prospects for business fixed investment in the long-run are very positive. The need to reduce the labor portion of total costs and enhance productivity growth in order to remain competitive in international markets is pressing. The continued expansion in exports and a modest advance in consumption expenditures will be further supportive of investment. Real business fixed investment is projected to rise by an average annual rate of 6.0 percent from 1992 to 2002 and 4.0 percent per year between 2002 and 2016. (Figure 22) The composition of investment will change fairly dramatically in the forecast period. The investment share of structures will decline while the equipment share rises. The fastest growing sector of the U.S. economy will be producers' durable equipment. The development of advanced electronics, which promise a high rate of return on investment, has led to a massive change in businesses' priorities for investment.

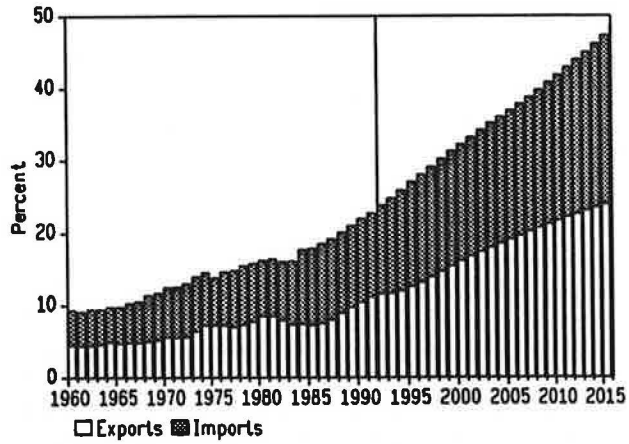

FIGURE 23 Trade's share of GDP.

International Trade

The decline in the value of the dollar and improvement in the real unit labor costs in the United States relative to the rest of the industrialized world will promote export expansion and a turnaround in the U.S. net export position. Further modest dollar depreciation and greater rest-of-world growth relative to the United States will make exports one of the fastest rising components of GDP. WEFA is projecting that real exports will expand at an average annual rate of 7.1 percent between 1992 and 2002. Export growth will average 4.7 percent after 2002. International trade in services has become increasingly important to the net export position of the United States. (Figure 23). Since 1974, the United States has run a surplus in real net exports of services in every year except 1985, the peak year in the real value of the dollar. Real service exports have grown as a share of

total exports of goods and services as well. In 1960, real service exports accounted for 19.4 percent of goods and services exports; by 1991 they represented 27.0 percent of the total. Real net exports of services are projected to rise from $55.7 billion in 1992 to $8.4 billion in 2002 and $207.9 billion in 2016. The United States will become an increasingly open economy with international trade playing a larger role in relation to real GDP.

AVIATION INFRASTRUCTURE AND DEMAND AS COMPLEX ADAPTIVE SYSTEMS

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Has the air transportation market reached saturation, or does it still have a way to go? What are the implications of the status of this market for the planning and design of air transportation infrastructure? The status of the market for air travel, and more fundamentally, how to think about the status of the market for air travel, are matters of great importance to the aviation community. Questions about market saturation are also important for other infrastructure systems.

The following remarks address these questions by reasoning from first principles about the nature of demand for derived goods and services like transportation and from exploring their implications for air transportation. They apply primarily to the aviation infrastructure sector, although they have some relevance to aircraft acquisition and carrier operations.

In reflecting on the significance of the degree of saturation for aviation infrastructure planning, it is essential to recognize how heavily planning relies on the predictability of the market. Predictability is a fundamental assumption of planing and design facilities. While this may seem obvious, it is well worth emphasizing. Of course, we predict demand when we invest in facilities that are going to last 25 or 30 years. But, it is important to recognize that predictability is an assumption, and as such, it may be correct or incorrect. Furthermore, it is an assumption that is fundamental to the business of aviation infrastructure planning. Not only do we assume predictability, we assume it over fairly long horizons. It is not uncommon to see forecasts to 2020 or 2025. Such predictions are very important inputs into decision making about the construction of airports, air traffic control systems, and other facilities and systems.

The specific nature of this assumption is that because facilities last 25 or 30 years, it must be useful to forecast their condition over the same time horizon. Furthermore, this assumption implies that, while we know the forecasts will be wrong (it is the nature of the business, after all) it is still useful to have them. That is, the forecasts are better than no information at all.

But it is an heroic assumption, nonetheless. Why do we make it? Because it is an essential rationale for those who believe in building long-term infrastructure. We are accustomed to providing for long term infrastructure, and we accept the concomitant assumptions. There may also be a little engineering conceit. Engineering materials will last for 25 or 30 years, after all. The world must be predictable enough for us to predict the conditions they will face over that horizon. Concrete and steel are fairly predictable materials under particular conditions; ought we not be able to predict the social and economic conditions that will affect them?

We have gotten very accustomed to this idea in making aviation infrastructure plans, and making infrastructure plans in other sectors. We might call it "the myth of predictability — the myth of assuming that the world is as predictable as the engineering materials we build with.

My second point follows directly from the first. The assumption of predictability is not very well grounded. Indeed, it is substantially at odds with the kinds of activities that generate air transportation demand. Part of the reason we believe in predictability is an extension of the Newtonian model of the universe. We can predict the location of the planets in the solar system. Social and economic forces ought to be equally as predictable.

But the Newtonian concept of the universe is now being widely questioned. The planets do move fairly predictably over the generations of man. But in astronomical time they are subject to highly unpredictable forces, such as the "Big Bang." We cannot trace back the trajectory of the universe very far in astronomical time, nor can we necessarily predict exactly where it is going to be a few astronomical generations from now.

Questions about the predictability of the universe in astronomical time are paralleled by questions about the predictability of systems and processes that are much closer to home: the economy, the stock market, technological innovation and progress. The widely used assumption of long periods of fairly predictable behavior punctuated by occasional "structural changes" is now in question A structural change such as the entry of women into the labor force in the 1960s is coming to be seen not as an aberration, but as an inherent aspect of