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August 7, 1992

To: Members of the Executive Board  
From: The Secretary  
Subject: World Economic Outlook - Annexes

The attached annexes provide supplementary material for the Executive Board discussion on Wednesday, September 2, 1992 of the paper on prospects and policy issues related to the world economic outlook (EBS/92/127, 8/6/92).

The name and telephone extension of staff members available to answer questions are mentioned on the first page of each annex.

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INTERNATIONAL MONETARY FUND

World Economic Outlook--Annexes

Prepared by Staff

Approved by Michael Mussa

August 6, 1992

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Asset Price Deflation,  
Balance Sheet Adjustment, and Financial Fragility <sup>1/</sup>

The May 1992 *World Economic Outlook* examined the role played by balance sheet adjustments in the nonfinancial sectors of the economy in constraining the pace of recovery in the United States and the United Kingdom. <sup>2/</sup> It also examined in less detail similar adjustments in Japan and the smaller industrial countries. This annex updates the earlier work and then focuses on the corresponding adjustments in the financial sectors of Japan, the United States, and several of the Nordic countries.

1. Factors underlying financial sector adjustment

Beginning in the late 1970s, and extending to the present, a large number of industrial countries initiated a process of financial deregulation and liberalization. The gains from this process in many countries have been substantial, including increased access to credit markets by households and enterprises, higher (market-determined) rates of remuneration on deposits, and a more market-determined allocation of resources. This process had important consequences for the nonfinancial and financial sectors, however, and these in turn have shaped the financial adjustments now underway. Financial liberalization allowed established financial institutions to work in new ways, and new institutions emerged that developed new services and a broader array of financial instruments. <sup>3/</sup> This broadening and deepening of the financial sector was associated with heightened competition among commercial banks and other financial institutions. Many institutions entered riskier lines of business and, later, increased the share of their assets held in highly leveraged transactions, leveraged buyouts, developing country debt, off-balance-sheet derivative products, and real estate markets. This riskier business made banks and other financial intermediaries more vulnerable to cyclical developments, particularly asset price adjustments.

Private nonfinancial sectors of the economy enjoyed greater access to credit markets which contributed to the long period of expansion during the 1980s. Private saving rates declined as the level of outstanding credit rose sharply: to finance consumption, housing, and commercial real estate booms in the United States, the United Kingdom, and the Nordic countries; and to finance strong consumption growth and an investment boom in Japan (Charts 1 and 2). This credit expansion exceeded the expansion in economic activity by a wide margin.

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<sup>1/</sup> Questions relating to this Annex may be addressed to Mr. Schinasi (ext. 36613).

<sup>2/</sup> Annex I, "Balance Sheet Constraints and the Sluggishness of the Recovery," *World Economic Outlook*, May 1992, pp. 47-51.

<sup>3/</sup> For further analysis, see IMF, *International Capital Markets: Developments and Prospects* (IMF, September 1992).

The conduct of monetary policy was also affected by disintermediation stemming from financial deregulation and liberalization, which rendered monetary indicators less reliable. 1/ Asset prices and interest rates became more volatile as new instruments were introduced, as competition increased, and as new arbitrage opportunities between the new instruments and markets were discovered. An important implication of financial market liberalization appears to be that monetary policies may have a more direct impact on asset prices than before. 2/ To the extent that asset prices and their movements are not captured by consumer price and wholesale price indices, however, monetary authorities may have ignored important information about the short-term and medium-term effects of their policies. Whether the increased sensitivity of asset prices to changes in monetary policies was a temporary factor, related to the transformation of financial systems, or is now a permanent feature of the new financial environment is uncertain.

## 2. Asset prices and nonfinancial balance sheet adjustments

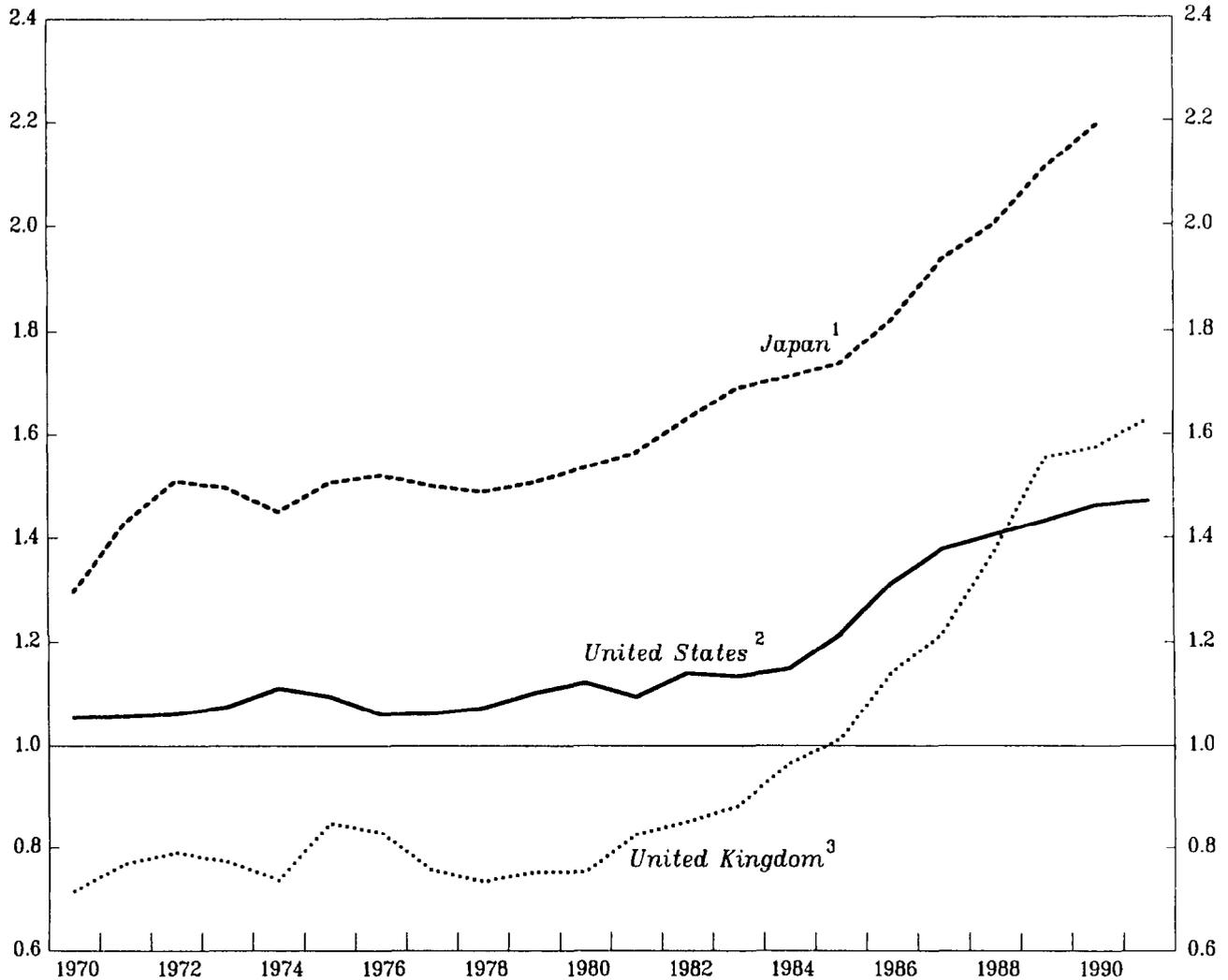
Partly as a result of these major changes to their financial system, several industrial countries experienced a boom in asset markets that was associated with a period of asset accumulation, an unprecedented buildup of debt, a sharp increase in relative asset prices, and related increases in

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1/ For a comprehensive survey of this important issue see, *Financial Innovation in International Banking* (Basle: Bank for International Settlements, 1985). In addition to the reduced usefulness of monetary aggregates as indicators of monetary policy, the study also noted that the other major effects of financial market deregulation and liberalization were: a rise in international capital mobility, which made it increasingly costly for countries to implement independent monetary policies; a shift in the channels of monetary policy toward exchange rates and interest rates, which had implications for the sectoral impact of a change in policy; the introduction of new instruments, which made it possible to diversify risks in ways that were not transparent a priori; and an increase in the issuance of floating-rate debt, which raised the vulnerability of highly-leveraged firms to a change in monetary policy.

2/ For example, before financial deregulation and liberalization, monetary tightening in the United States affected the supply of credit to households and businesses through the banking system; banks, in effect, rationed the quantity of credit as reserves were withdrawn from the system. Because there are now many alternatives to bank lending, this quantity rationing mechanism may have become less important and price adjustments in asset markets (including interest rates) may have become more prominent in both reflecting and transmitting monetary policy changes to the real economy. For a discussion of some of these issues, which is beyond the scope of this annex, see, for example, A.W. Wojnilower, "The Central Role of Credit Crunches in Recent Financial History," *Brookings Papers on Economic Activity*, 2 (1980), pp. 277-326.

Chart 1. Total Private Nonfinancial Sector Debt  
(Debt-GDP ratio)



Sources: For the United States, Data Resources, Inc. data base; for the United Kingdom, Central Statistical Office, *Financial Statistics*; for Japan, Economic Planning Agency, *National Income Accounts*.

1 Total financial liabilities of the private nonfinancial sectors less trade credits.

2 Total financial liabilities of the personal and the industrial and commercial sectors less outstanding domestic trade credits and ordinary and preference shares.

3 Total credit market debt outstanding of the private nonfinancial sectors.



Chart 2. Personal Saving Rates<sup>1</sup>  
(Percent of disposable income)

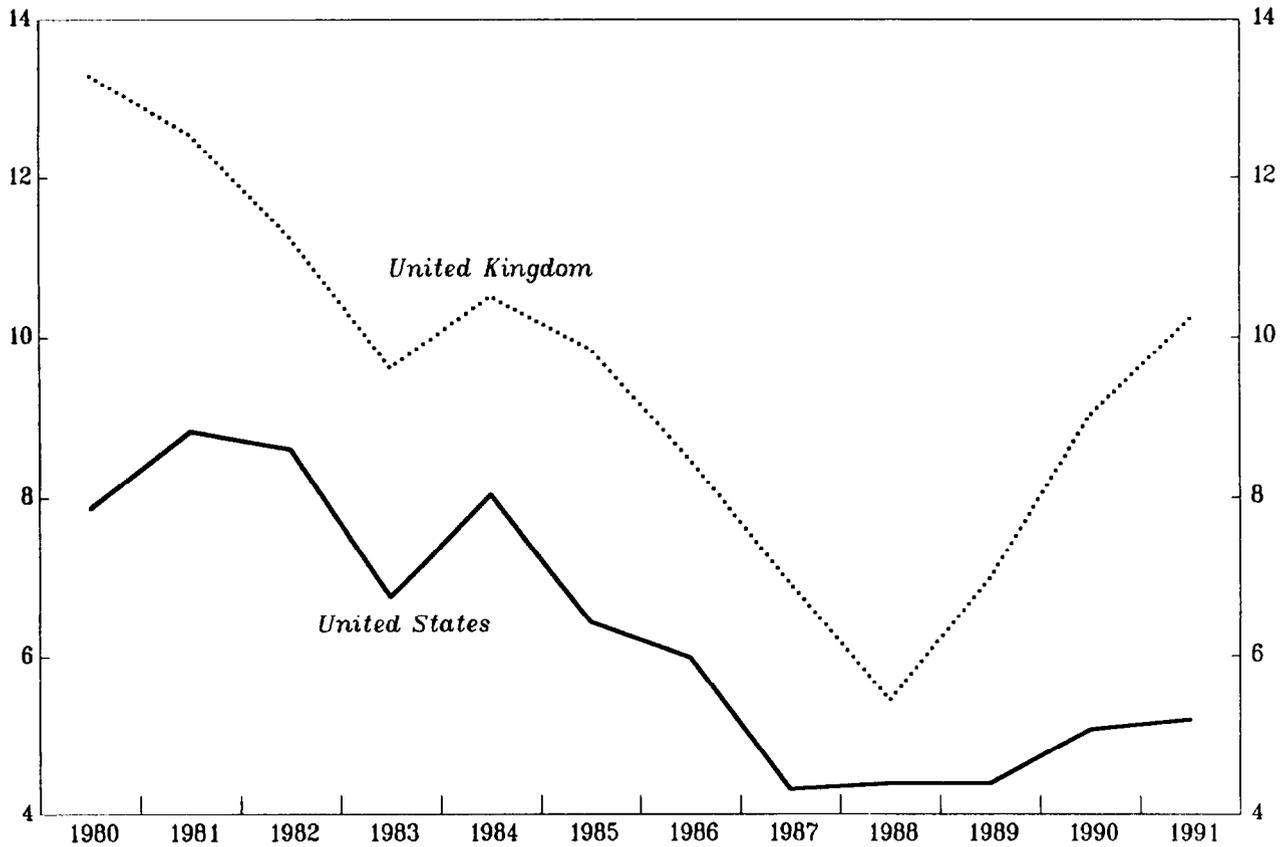
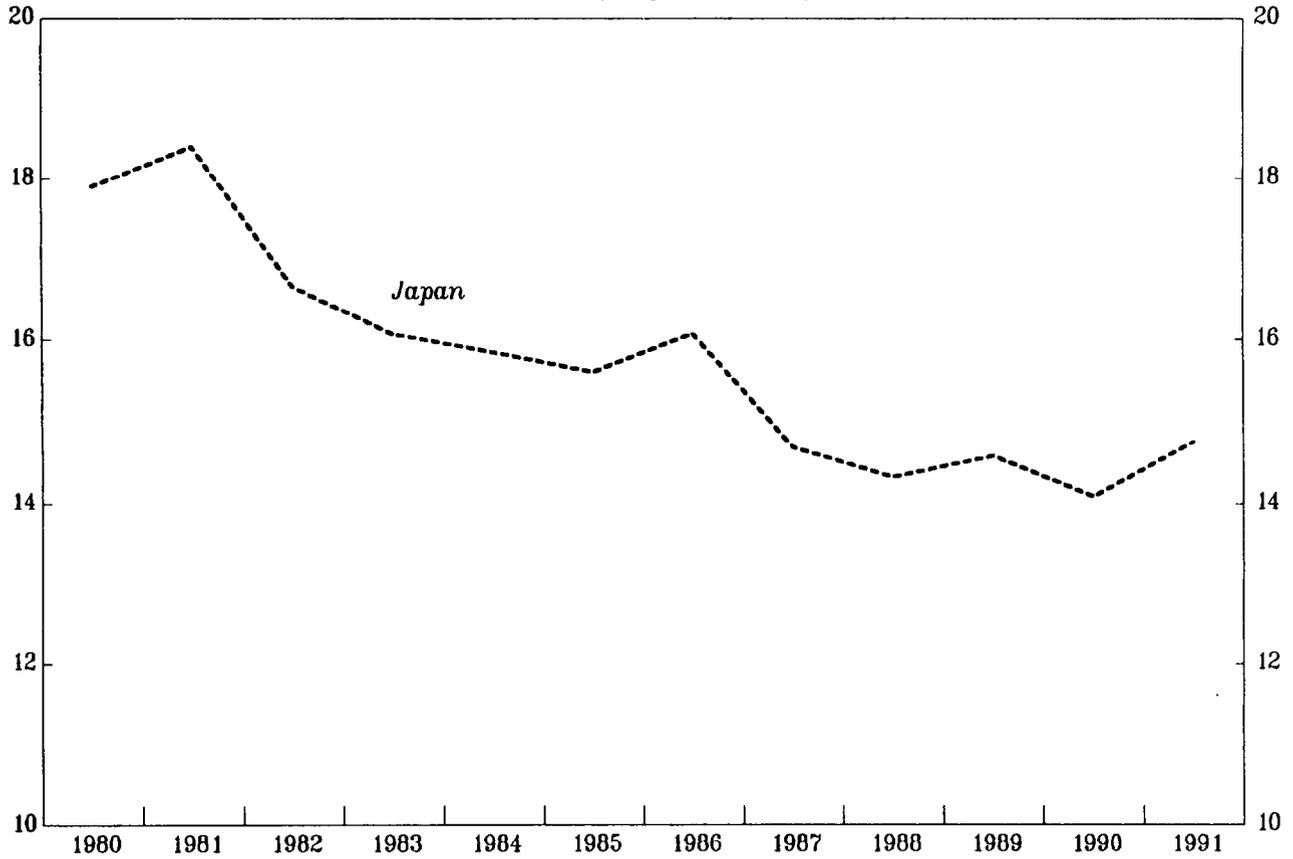
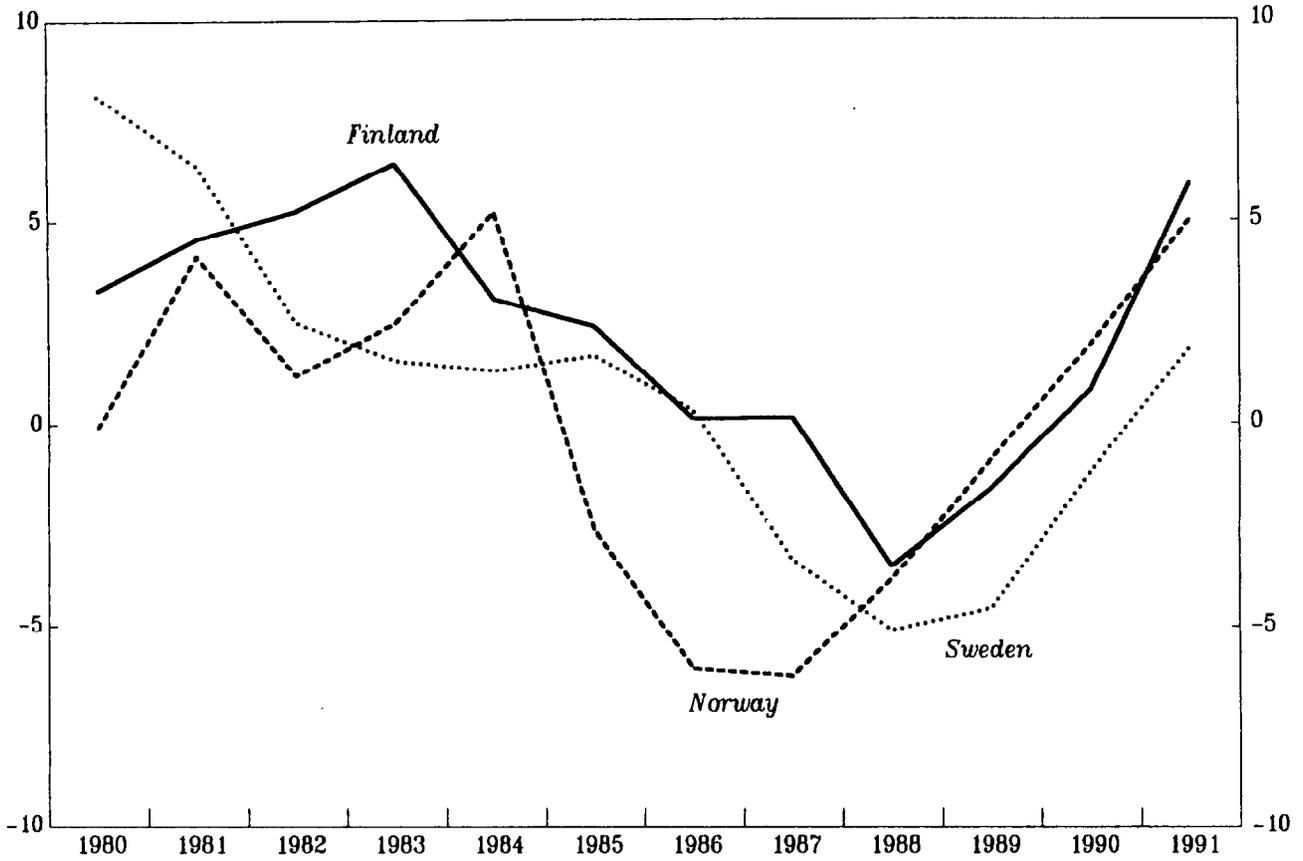




Chart 2 (concluded)



Source: National sources and *World Economic Outlook* data base.

1 Capital gains are not included in the national income accounting definition of disposable income, so saving rates can be negative even when the stock of wealth is rising.



household wealth. The appreciation of real estate values provided homeowners with unrealized capital gains, which further encouraged households to reduce saving rates and acquire assets on the expectation of even greater price appreciation. The asset markets most affected were the residential and commercial real estate markets--most notably in Japan, the United Kingdom, and the Nordic countries, but also in the United States. Inflation-adjusted residential property prices increased at an annual average of 13 3/4 percent (19 1/2 percent nominal) in the United Kingdom during 1986-89 and 6 1/4 percent (10 1/4 percent nominal) in the United States (Chart 3). In Japan, real land prices increased sharply, recording an annual average increase of 20 1/4 percent (21 3/4 percent nominal) during 1986-90. In some countries there were also sharp increases in stock prices, most notably in Japan, but also in others including the Nordic countries (Chart 4).

Although the increases in asset prices and in indebtedness appear to have been influenced by the common factors cited above, country-specific factors were also important. In the United States, demographic changes in the age composition of the population contributed to the increased demand for residential structures. In addition, changes in tax legislation removed most of the allowable tax deductions for households except the mortgage interest deduction, thereby encouraging households to restructure their debt in favor of mortgage debt. Other features of the tax code that encouraged real estate development in the early 1980s were later removed and contributed to the decline in activity in that sector in the late 1980s and early 1990s. The increase in total debt in the late 1980s and the shift toward floating-rate loans, made the household sector more vulnerable to the increase in interest rates that occurred toward the end of the expansions and to the decline in real incomes that occurred during the recession.

In the United Kingdom, new attractive mortgage instruments and the privatization of council housing contributed to the boom in real estate markets. In Japan, the run-up in debt and asset prices was in part driven by a shift toward the greater use of credit. Finally, in the Nordic countries, long-standing elements of the tax code such as the deductibility of interest payments coupled with very high marginal tax rates amplified the accumulation of debt and the acquisition of real estate as credit markets were liberalized.

In the business sector, expanded opportunities for direct participation in securities and money markets encouraged an overall increase in borrowing. In particular, the strength of equity markets in Japan brought a steep rise in corporate borrowing as firms took advantage of the opportunity to borrow cheaply by attaching equity warrants to debt issues. Corporate leverage in the United States increased as well during the 1980s, encouraged by elements of the business tax code such as accelerated depreciation, although not beyond levels observed in the late 1960s and early 1970s. Borrowing by nonfinancial firms in general increased, with part of this increase financing a boom in commercial property investment.

By the second half of the 1980s, the economies of many industrial countries were producing at high levels of resource utilization, and demand pressures were increasing. To maintain policies consistent with medium-term objectives of noninflationary growth, monetary policies were tightened in many countries. By 1991, economic recessions were experienced in North America and the United Kingdom, and growth slowed sharply in Japan. Smaller industrial countries were also affected, including Sweden, Norway, Finland, Australia, Switzerland, and New Zealand; in some instances a significant weakening of economic activity was already being experienced by the end of the 1980s. A consequence--and in some cases an objective--of these policy adjustments was a sharp reversal of the earlier run-up in asset prices.

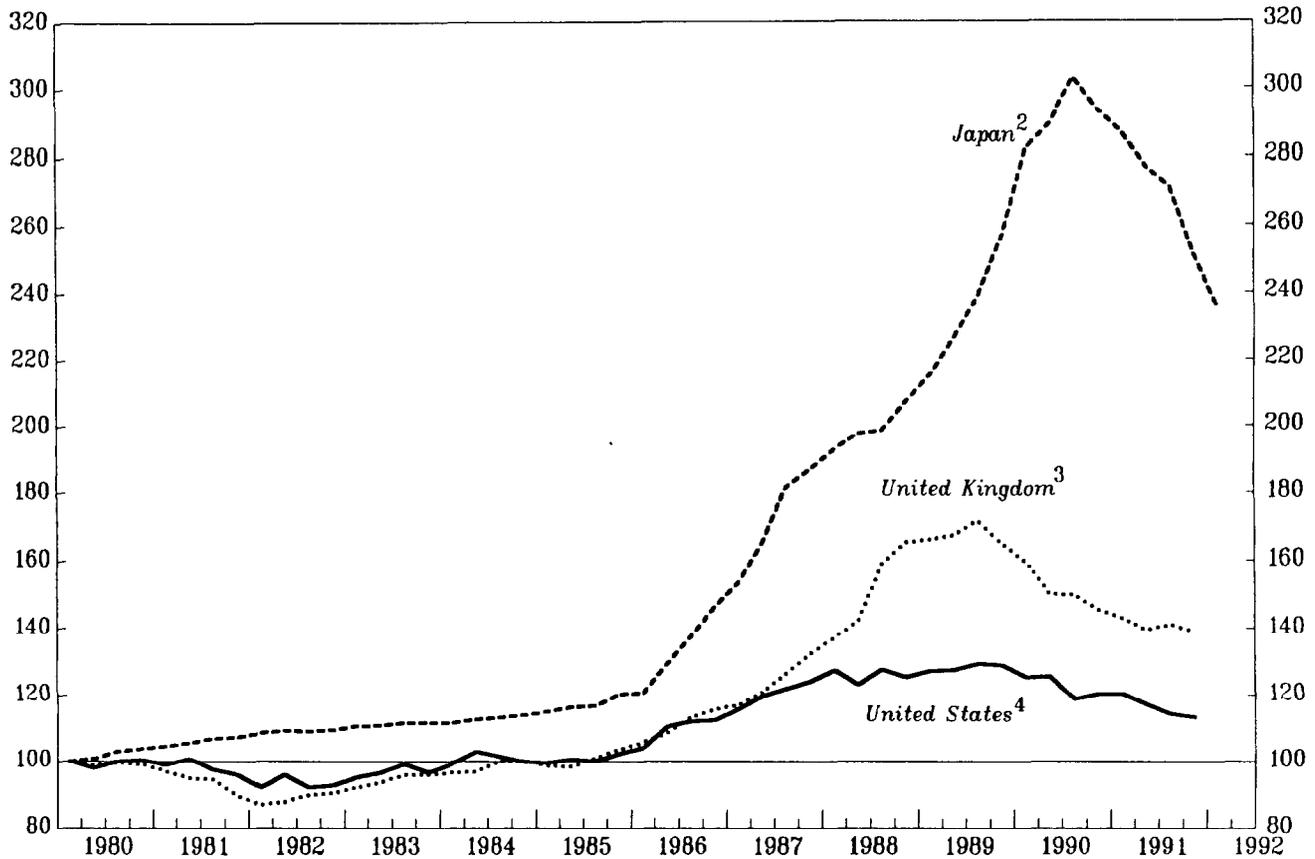
As examined in detail in the May 1992 *World Economic Outlook*, balance sheet constraints contributed significantly to the sluggishness of the recovery from recession in the United States and have contributed to continuing weakness in the United Kingdom. As incomes, confidence levels, and financial and real asset values all fell, households and businesses adjusted their balance sheets to reduce their indebtedness at a time when consumer and investment outlays were at already low levels. Financial positions appear to have improved considerably in the United States by mid-1992 and a modest recovery seems to be underway. In the United Kingdom, where financial adjustments were more pronounced, the economy may be at a turning point and is expected to stage a recovery in the second half of the year.

There is still considerable uncertainty about short-term prospects for Japan. The rise in stock prices--which began in Japan in the early 1980s and reversed as the decade ended--far exceeded the appreciation in stock values in the United States (Chart 4). Real property prices also appreciated significantly. The stock and land price "bubbles" were linked because a portion of the initial stock price increase was related to increases in the perceived market value of corporate land assets.

During 1985-89, household net worth in Japan rose at an annual average rate of 16 percent--from the equivalent of 5 1/2 times annual household disposable income at end-1985 to 8 3/4 times income by end-1989 (Chart 5). It is estimated that capital gains on land holdings accounted for about 70 percent of the rise in net worth during this period, and those on stock holdings for another 13 percent. Thus far, although asset prices have fallen dramatically, balance sheet adjustments and their real effects have been less pronounced in Japan than in the other industrial countries. In 1991-92, it is likely that net worth declined further, as both equity prices and (especially) land prices have continued to decline dramatically. As of end-March 1992, residential land prices in the six largest cities in Japan had fallen by 21 percent (see Chart 3) and they still appear to be high in real terms relative to past experiences.

The impact on demand of this change in wealth in Japan is difficult to quantify because of the uncertainty about the relationship between consumption and unrealized capital gains on stock and property holdings.

Chart 3. Selected Countries: Property Prices<sup>1</sup>  
(1980:Q1 = 100)

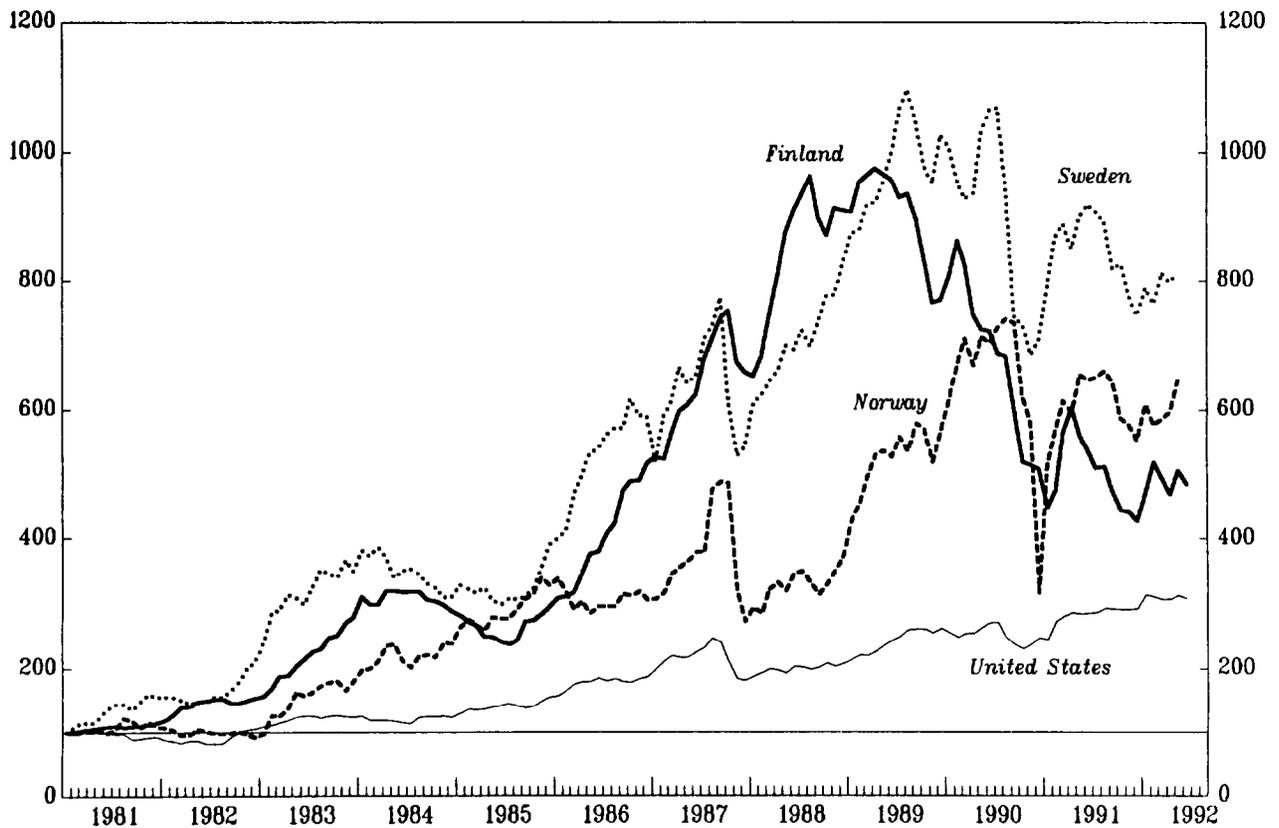
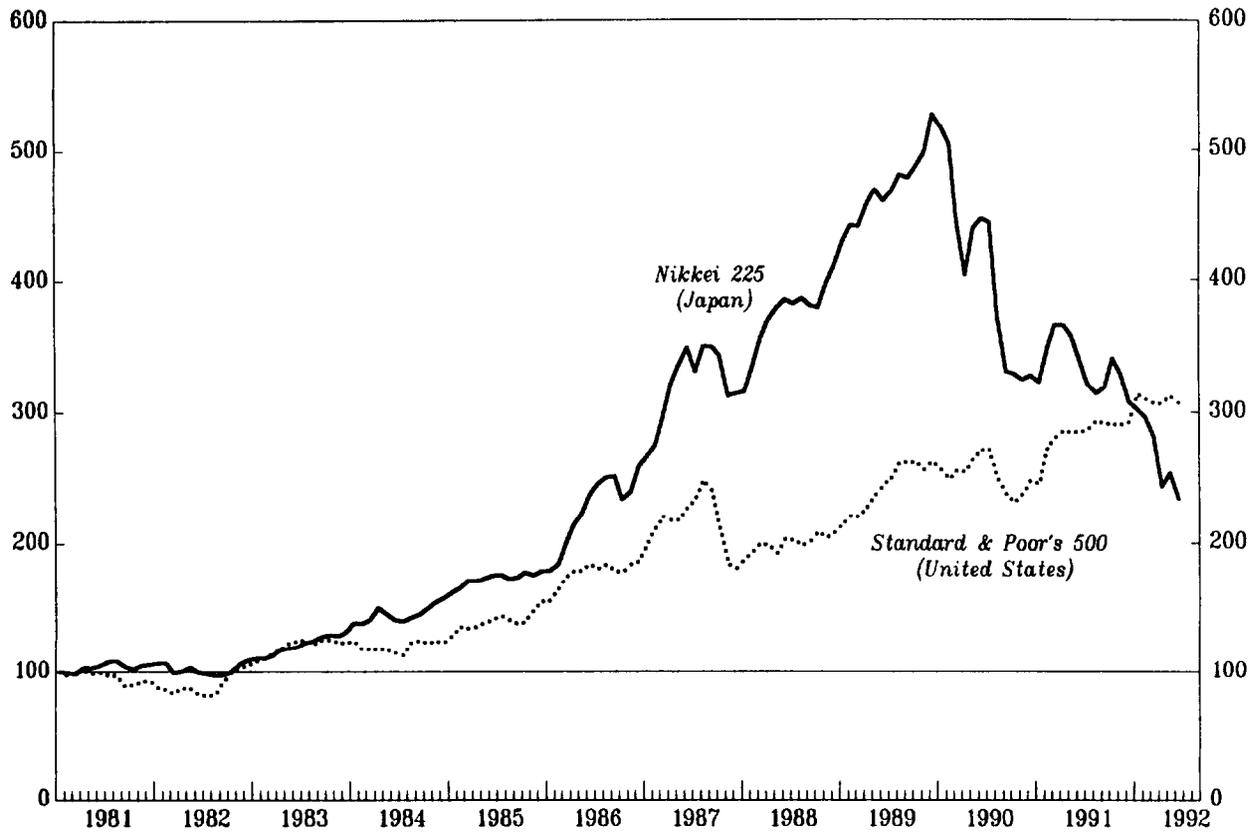


Sources: For the United States, Data Resources, Inc. data base, for the United Kingdom, Central Statistical Office, *Financial Statistics*; for Japan, Japan Real Estate Institute, *Bulletin of Japan Land Prices*.

- 1 Property prices deflated by consumer prices indexed to the same year and then reindexed (1980:Q1 = 100).
- 2 Urban residential land price in six largest cities.
- 3 Index of prices on dwellings.
- 4 Average price of a new house.



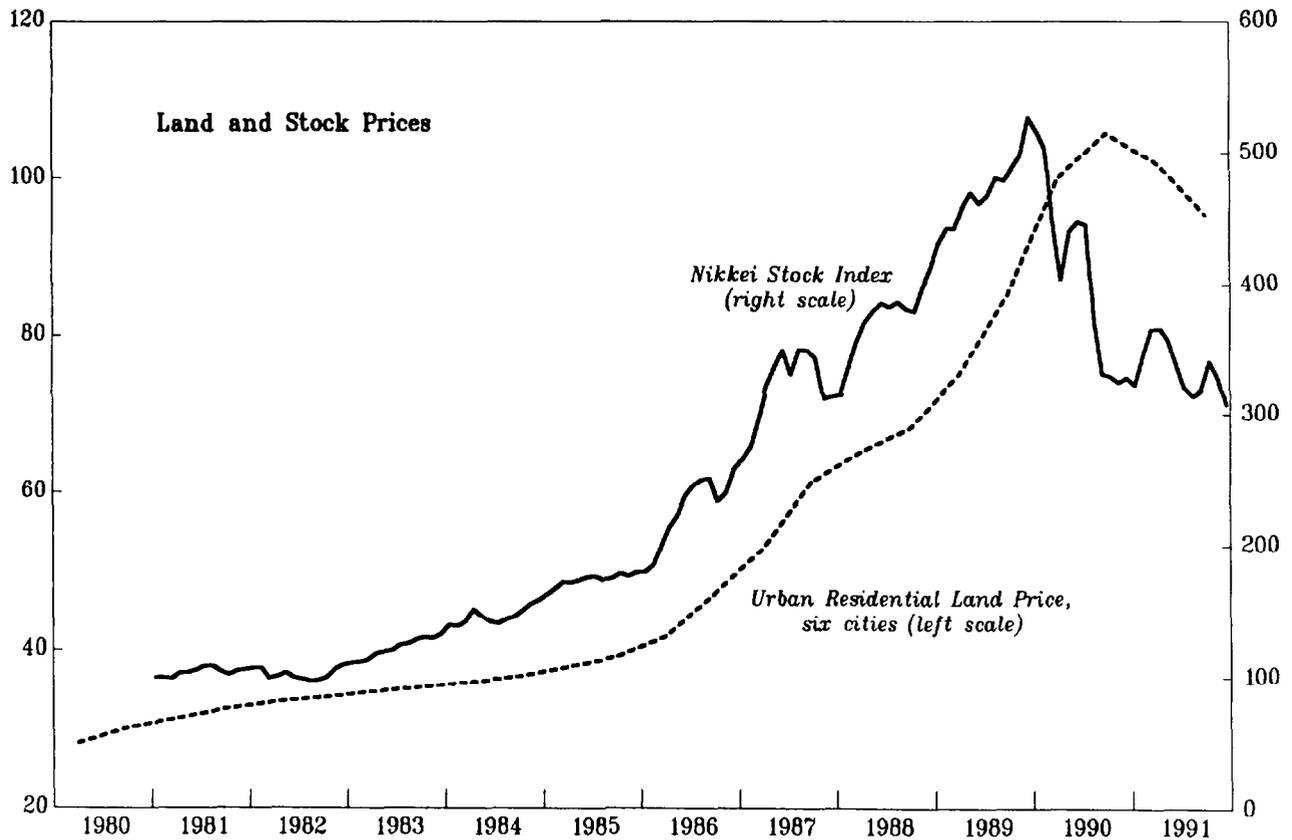
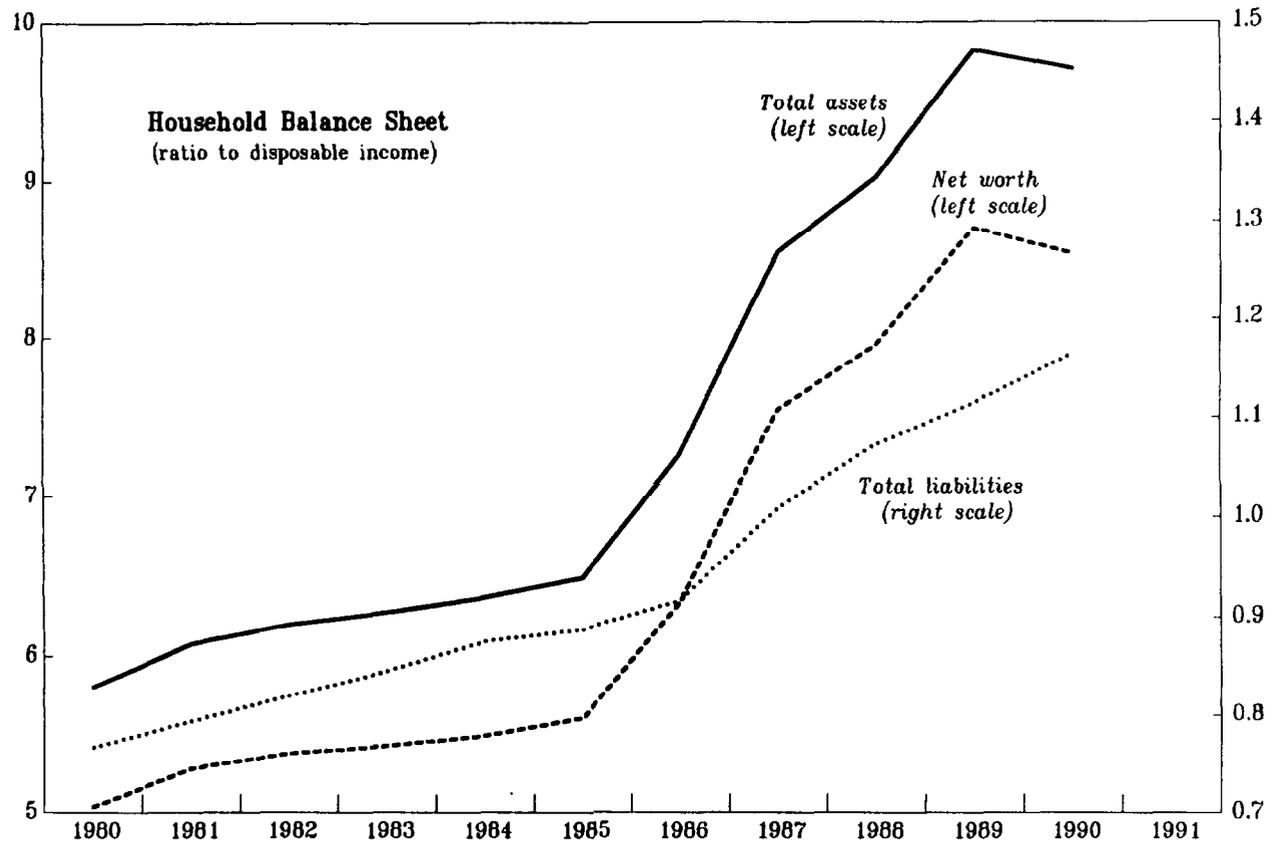
Chart 4. Selected Countries: Stock Market Indices  
(January 1981 = 100)



Sources: For the United States, Data Resources Inc.; for Japan, Nikkei Services; for Finland, Norway, and Sweden, IMF, *International Financial Statistics*.



Chart 5. Japan: Household Balance Sheet; Land and Stock Prices



Sources: Economic Planning Agency, National Income Accounts; Nikkei Services; Japan Real Estate Institute, Bulletin of Japan Land Prices.



Households hold a small portion of outstanding stocks, and land holdings are rarely sold because they tend to be transferred within families. On these grounds the impact on household behavior of falling asset prices is expected to be small. Growth in private consumption expenditure has already declined, from 4 1/4 percent in 1990 to 2 3/4 percent in 1991, and is expected to remain at 3 percent in 1992.

The weakness in asset prices in Japan has also adversely affected investment. Strength in equity markets contributed to an improvement in the financial position of nonfinancial corporations during the late 1980s. Profits and new stock issues financed a boom in plant and equipment and the strong equity markets supported an increase in debt issues as corporations issued bonds with equity warrants (an option to convert debt into equity at a predetermined price), which allowed them to attract funds at very low rates of interest. Corporate leverage measured in terms of debt-equity ratios declined significantly by 1989, although the ratio of gross debt to total assets rose steadily through the 1980s. During 1988-90, real business fixed investment rose at an average rate of nearly 15 percent.

With the downturn in the Japanese stock market, equity financing has been sharply reduced, and profitability has declined as asset values (including land) continued to fall. Growth in investment slowed to 6 percent in 1991, and in early 1992 the level of investment declined. The current projections are based on the assessment that the effects of the asset price adjustments will continue to be contained and that business investment, after stagnating in 1992, will recover moderately in 1993. There are downside risks, however. An important factor that will lower profits and increase the cost of capital, over the next few years, is the need to refinance the large volume of outstanding equity warrants at much higher interest rates than when the debt was originally issued.

### 3. Balance sheet adjustment in the financial sector

Financial systems in industrial countries expanded significantly in the past two decades. This growth occurred through the expansion of balance sheets and off-balance-sheet activity, the volume of trade on securities markets, and the volume of payments. It is also reflected in the financial industry's employment growth and its share in total value added (Table 1).

Table 1. Indicators of Growth in the Financial Industry

	<u>Share in Total Employment</u>			<u>Share in Value Added</u> <u>1/</u>		
	1970	1979	1989	1970	1979	1989
United States	3.8	4.2	4.8	4.1	4.5	5.7 <u>2/</u>
Japan	2.6	2.8	3.4	4.5	4.9	5.6
United Kingdom <u>3/</u>	6.0 <u>4/</u>	7.0	11.4	12.5	14.8	20.0
Finland	2.4 <u>5/</u>	2.5	3.1	3.1 <u>5/</u>	3.0	3.9
Norway	1.9	2.2	3.0	2.3	3.1	4.4
Sweden	...	1.7 <u>6/</u>	2.0	...	3.1 <u>6/</u>	4.4

Source: Bank for International Settlements, *Sixty-Second Annual Report* (Basle, 1992), p. 197.

1/ GNP/GDP plus imputed bank service charge, at current prices.

2/ 1987.

3/ Including real estate and business services

4/ 1971.

5/ 1976.

6/ 1980.

Underlying this overall expansion were substantial structural changes within the financial industry. Before deregulation, banks were governed and protected by a network of regulations and restrictions. Deregulation and liberalization lowered barriers to new domestic and foreign entrants, eliminated interest rate regulations, and weakened restrictions on bank activities. This new financial environment is distinguished by its competition-driven disintermediation from banking systems--particularly from wholesale banking systems--into securitized money and capital markets. The volume of mutual fund assets has expanded considerably in many countries, and commercial paper markets were established and have grown rapidly, offering households and firms alternatives to traditional banks. Moreover, because of the increased concentration of saving in large "collective" institutions, notably pension funds, the movement of funds has become more responsive to price differentials. 1/

1/ For a more detailed discussion of these changes see *International Capital Markets: Developments and Prospects*, (IMF, September 1992), and Bank for International Settlements, *Sixty-Second Annual Report* (Basle, 1992).

Banks have had to respond to two challenges in the new competitive environment: to retain their volume of business and client bases, and to manage the industry-wide squeeze on profit margins. In addition, the new capital adequacy standards of the Basle Accord have sharpened attention on risk-weighted capital-asset ratios. 1/ Banks have responded to these challenges with aggressive innovations, expansion into new markets, and a shift toward noninterest income.

New types of bank loans and accounts have prevented even greater disintermediation but also have reduced net interest margins because more deposits now earn market-related rates of return. For city banks in Japan, for example, the proportion of liabilities bearing market-related interest rates rose from 10 percent in 1980 to over 70 percent in 1990. Competition from other nonbank financial intermediaries has placed additional pressure on industry-wide profit margins; as a result, bank profitability broadly declined in the 1980s (Table 2). Competition also encouraged banks to expand into activities that provided fee-based income rather than traditional interest income (Chart 6). Banks have increased their provision of advisory services, trading, brokerage, underwriting, and other financial support activities to the extent that regulations have permitted. Conglomeration also has been important--particularly in Europe, where fee-based insurance and real estate brokering have been significant. In the United States and Japan, recent regulatory and legislative initiatives have laid the groundwork for expansion into the securities industry.

Increased competitive pressures and the decline in the special role of banking may have induced large wholesale banks to shift to high-risk, high-return investments. Given their exclusive direct links to central banks, banks are the only provider of risk-free liquidity to financial and payments systems. This unique role has been a primary source of banks' "franchise value." With the securitization and expansion of financial systems, the need for customers to have direct access to bank-provided liquidity has diminished and banks have seen their traditional sources of income weaken. 2/ In the United States, the loss of market share and heightened price competition may have contributed to increased risk-taking by banks. This was reflected in an increase in lending to developing countries in the 1970s and early 1980s, and to off-balance-sheet activity and lending for highly leveraged transactions and real estate later in the 1980s.

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1/ Basle Committee on Banking Supervision, "International Convergence of Capital Measurement and Capital Standards" (Basle: Bank for International Settlements, July 1988).

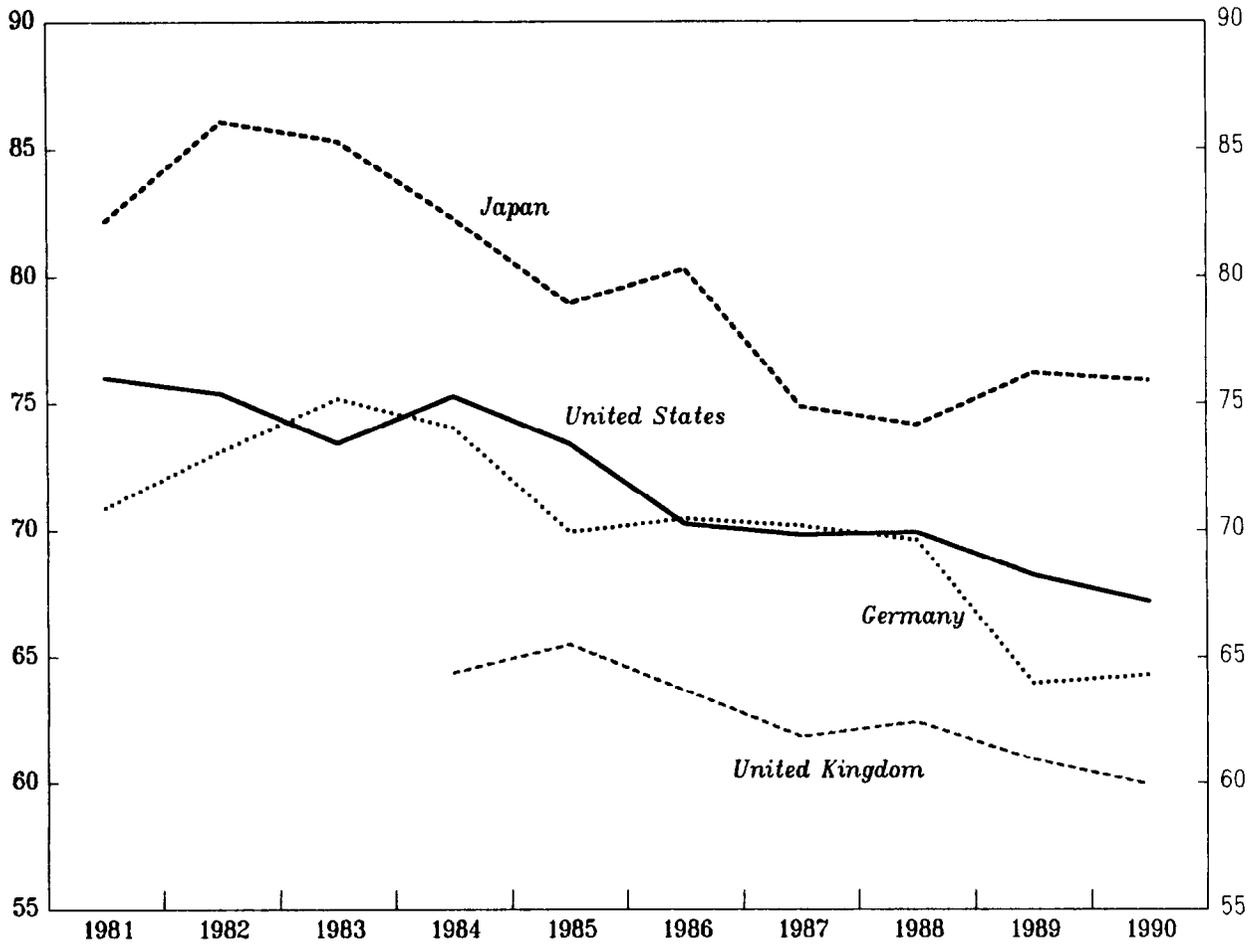
2/ For a detailed analysis of this link and the consequences of declining franchise value, see Steven R. Weisbrod, Howard Lee, and Liliana Rojas-Suarez, "Bank Risk and the Declining Franchise Value of the Banking Systems in the United States and Japan," IMF Working Paper 92/45 (Washington, 1992).

Table 2. Bank Profitability in Selected Countries 1/  
 (Ratio of before-tax profits to total assets, in percent)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
United States										
Commercial banks	1.00	0.88	0.84	0.84	0.90	0.80	0.278	1.14	0.78	0.73
Large commercial banks	0.84	0.74	0.72	0.73	0.90	0.85	0.01	1.23	0.62	0.59
Japan										
Commercial banks	0.45	0.50	0.54	0.49	0.46	0.52	0.60	0.64	0.46	0.36
Large commercial banks	0.41	0.45	0.49	0.46	0.43	0.50	0.63	0.68	0.46	0.33
Germany										
Commercial banks	0.43	0.53	0.60	0.72	0.83	0.81	0.60	0.73	0.70	0.63
Large commercial banks	0.44	0.59	0.84	0.86	1.05	0.99	0.61	0.89	0.92	0.83
United Kingdom										
Commercial banks	...	...	...	0.88	1.09	1.19	0.19	1.52	0.11	0.65
Large commercial banks	1.21	0.84	0.82	0.81	1.09	1.21	0.12	1.51	0.03	0.50
Norway										
Commercial banks	0.72	0.54	0.91	0.85	0.64	0.64	-0.24	-0.32	0.17	-1.02
Sweden										
Commercial banks	0.41	0.35	0.44	0.35	0.34	1.00	0.73	0.59	0.47	0.22
Finland										
Commercial banks	0.48	0.51	0.42	0.49	0.54	0.63	0.45	0.77	0.22	0.21
Denmark										
Commercial and savings banks	0.95	1.20	5.08	0.09	3.72	-0.37	0.35	0.96	0.28	-0.27

Source: OECD, Bank Profitability: Statistical Supplement-Financial Statements of Banks, 1981-1990 (Paris, 1991).

**Chart 6. Selected Countries: Contribution of Interest Income**  
(Commercial banks' net interest income as percent of gross income)



Source: OECD, *Bank Profitability: Statistical Supplement--Financial Statements of Banks, 1981-1990* (Paris, 1991).



The attraction of growing securities markets and the associated opportunities for fee-based income have contributed to an expansion in banks' off-balance-sheet activity, particularly in the form of trade in derivative securities such as futures, options, and swap contracts. The increase in banks' exposure, and that of their customers, to the volatility of interest rates and exchange rates has made these securities an attractive hedging device. The value of the outstanding stock of financial derivative instruments has grown from 10 percent of OECD GDP in 1986 to 40 percent in 1991. 1/ The difficulty of assessing accurately the resulting risk to banks has attracted the attention of regulators.

There was also a significant shift in bank portfolios toward real estate in the late 1980s that was driven by increased demand for real estate investments and the expectation of high returns (Table 3). Heightened competition for market shares provided incentives for banks to eagerly provide loans to this growing market. The resulting increase in exposure to price risk in real estate markets has had serious consequences in countries where there have been sharp declines in property values.

The economic downturn in the United States and other major countries has made these financial adjustments more difficult. Business failures and personal bankruptcy rates have increased significantly in Japan and the United Kingdom. Loan-loss rates at banks and other financial institutions are historically high. Mergers and acquisitions in the financial sector have occurred rapidly and on a large scale. Bank share prices have fallen throughout the 1980s, in some countries very sharply (Chart 7).

During 1989-90, bank lending began to slow significantly in many countries, in stark contrast to previous growth rates of 15 percent or higher (Table 4). These developments reflected general pressures on bank balance sheets, a cyclical decline in the demand for loans, and deliberate efforts to reverse the excessive growth of real estate lending and to restore balance to bank portfolios. 2/

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1/ These amounts reflect the value of assets underlying these contracts and are stated on a gross basis; on a net basis volume, they would be zero.

2/ In Japan, concern about banks' exposure to real estate lending led the Ministry of Finance to impose quantitative limits on the growth of that portion of banks' portfolios during 1990-91.

Table 3. Bank Real Estate Lending in Selected Countries 1/

	1985	1987	1991
<u>(As a percentage of total loans outstanding)</u>			
United States			
Total	29	34	42
Commercial	13	17	17
United Kingdom			
Total	19	23	31 <u>2/</u>
Nonhousing <u>3/</u>	7	8	12 <u>2/</u>
Japan <u>4/</u>	13	15	17
<u>(As a percentage of loans to the private sector)</u>			
Canada	33	39	49
France	29	29	31
Germany	46	45	40
Norway	48	41	52
Portugal	28	33	32
Spain	19	20	29
Switzerland	28	29	34 <u>5/</u>

Source: Bank for International Settlements (Basle).

1/ Data are not fully comparable across countries.

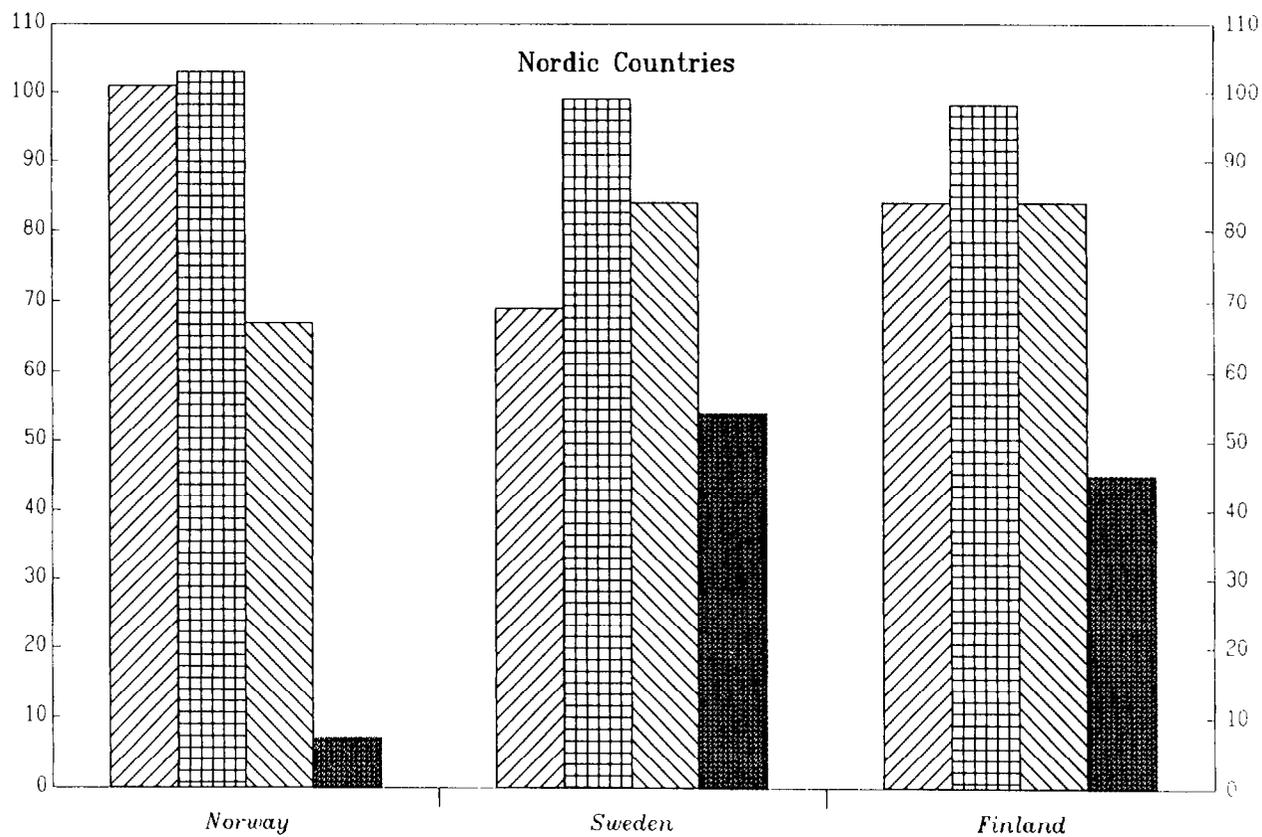
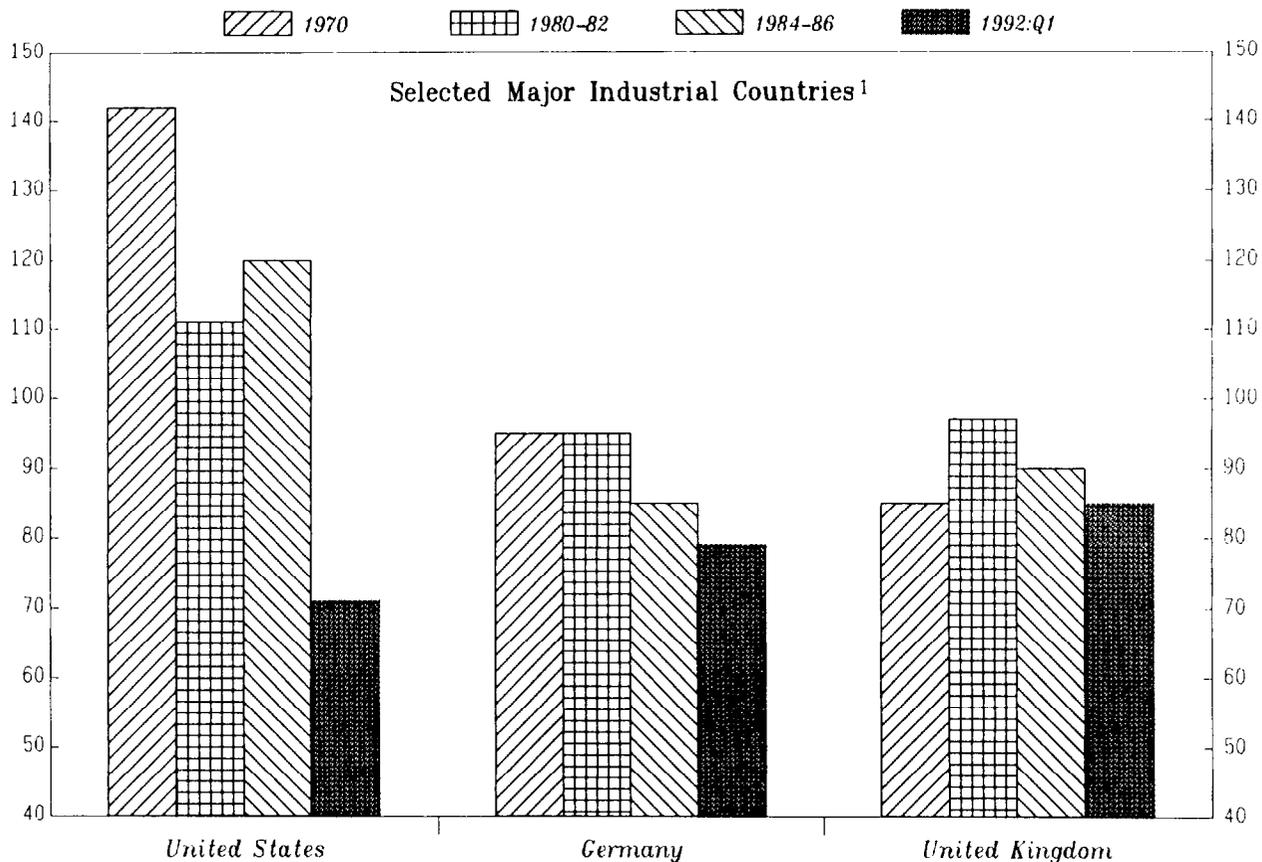
2/ Break in series resulting from the inclusion of a building society which was converted into a bank.

3/ Construction and property companies.

4/ Construction and real estate management firms.

5/ 1990.

**Chart 7. Selected Countries: Relative Strength of Bank Stocks**  
*(Bank index relative to overall index, 1980 = 100)*



Source: Bank for International Settlements, *Sixty-Second Annual Report* (Basle, 1992).

<sup>1</sup> Data on bank share valuation for Japan are not included because of distortions from restrictive arrangements that were lifted in the mid-1980s.



Table 4. Bank Loan Growth Rates

(Annual average growth)

		Business	Housing	Individuals
United States	1983-90	6.5	14.3	8.6
	1991	-4.0	3.3	-4.1
Japan	1983-90	7.7	19.0	14.6
	1991	2.4	4.4	6.1
United Kingdom	1983-90	18.0	14.9	16.4
	1991	6.3	4.3	3.6

Source: Bank for International Settlements, Sixty-Second Annual Report (Basle, 1992), p. 117.

Part of the reduction in bank lending has reflected the use of other sources of funding by households and businesses, such as the commercial paper market and nonbank financial intermediaries. This shift is an integral part of the deregulation and liberalization of financial systems. Many nonbanks also expanded heavily into real estate lending in the 1980s, however, and are themselves now faced with portfolios weakened by the asset price disinflation and relatively slow economic growth. In Japan, real estate loans make up 43 percent of nonbank assets, and 70 percent of nonbank loans are secured by real estate. In the United States, nonbank financial institutions have already tightened lending conditions.

#### 4. Experience in selected countries

The scale and possible consequences of restructuring and retrenchment have been well illustrated by the savings and loan crisis in the United States. Savings and loan institutions were established to provide long-term financing for housing, but at the same time they relied on short-term deposits for funding. Interest rate increases in the 1970s and early 1980s greatly reduced profit margins because of the mismatch in maturity between assets and liabilities. By the early 1980s, the industry was severely undercapitalized. <sup>1/</sup>

<sup>1/</sup> See Steven Fries, "An Expensive Thrift Industry," in *The U.S. Economy* (IMF, 1992) forthcoming.

The initial policy response expanded the lending activities of savings and loan institutions, and safety nets (deposit insurance, for example) encouraged institutions to take on excessively risky investments. By the mid-1980s, financial weakness had become widespread within the thrift industry, and the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 was a comprehensive response to the resulting crisis. The costs, however, have been high: government deposit insurance outlays are expected to be on the order of \$70 billion a year during 1991-93. Further weakness in asset markets would increase costs even further by reducing the liquidation value of savings and loan assets handled under the Act.

The savings and loan crisis has focused attention on the risks inherent in financial reform and has raised concern about the strength of the U.S. commercial banking industry. Although not comparable to the losses in the savings and loan industry, bank losses have also been substantial. The number of bank failures declined from 206 in 1989, the highest since the Great Depression, to 124 in 1991, but the size of failed banks has increased substantially. The asset value of failed banks in 1991 exceeded \$60 billion, roughly double the amount in 1988-89. Consolidation in the banking industry has proceeded in part by merger, although the evidence that mergers reduce costs and improve efficiency is mixed. 1/

A critical issue has been whether weakness in the financial sector has created a credit crunch, and thus worsened the recession. Studies of bank lending have shown that commercial loan growth was lower at banks in districts with weak employment, at banks with weaker capital positions, and at banks with lower-quality loan portfolios. 2/ It is unclear whether this slowdown was due primarily to decreased demand or to changes in bank behavior. Survey evidence on the number of senior loan officers reporting tight credit conditions is also ambiguous. The recession and the general increase in nonbank sources of funds for high-quality borrowers are likely to have changed the mix of borrowers with whom banks deal. Aggregate figures on borrowing from nonbanks show declines quite similar to the declines observed in bank short-term lending, which suggests that decreased demand is important in the overall slowdown in lending. Moreover, supply shortages have been partially offset by a surge in foreign bank lending to U.S. corporations. 3/

Financial adjustments that have recently occurred in the financial systems of Sweden, Norway, and Finland stand out because of the scale of

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1/ Allen N. Berger and David B. Humphrey, "The Dominance of Inefficiencies over Scale and Product Mix Economies in Banking," *Journal of Monetary Economics*, Vol. 28 (August 1991), pp. 117-48.

2/ Ronald Johnson, "The Bank Credit 'Crumble'," *Federal Reserve Bank of New York Quarterly Review*, Vol. 16, (Summer 1991), pp. 40-51.

3/ Robert N. McCauley and Rama Seth, "Foreign Bank Credit to U.S. Corporations: The Implications of Offshore Loans," *Federal Reserve Bank of New York Quarterly Review*, Vol. 17 (Spring 1992), pp. 52-65.

government intervention that has been required to sustain the banking systems. Rigid and anticompetitive regulatory structures in all three countries were replaced with deregulated systems. Access by foreign institutions was increased, competition was intensified, and interest rates were liberalized in stages. High marginal tax rates and the tax deductibility of interest payments also encouraged speculative booms in real estate and inflation. Subsequent policy tightening and external shocks resulted in an economic contraction, sharp drops in real estate prices, and significant increases in commercial bankruptcy rates. All these contributed to a sharp weakening in the financial position of the banking system. Securities markets and nonbank institutions are not as extensive in these economies as in some others, so weakness in the concentrated banking sector is of even greater concern to policy authorities.

Finland is currently experiencing its worst recession in the post-war period, in part because of the collapse in trade with the states of the former Soviet Union and a decline in world demand for forest products. The financial sector has been severely weakened following a rapid expansion of lending in the late 1980s that included increased risk taking, expansion into relatively unknown markets, and reduced attention to asset quality and portfolio risk. Profitability has been squeezed by lingering interest rate rigidities, which have kept many of the outstanding loans at low rates of interest while deposits increasingly earn market rates of interest. The recession has made debt servicing more difficult for firms and households, and this has added to the pressure on banks. Nonperforming loans and guarantees amounted to Fmk 42 billion at the end of 1991--roughly 10 percent of outstanding bank loans. 1/ Severe credit losses at a major bank led the Bank of Finland to take it over in September 1991. 2/ Given the weakness of banks, there is concern about a credit crunch because share and bond markets are playing a smaller role in the provision of finance than in normal times.

In Norway, a boom in business and household borrowing and a substantial increase in real estate lending were counteracted in the late 1980s by tight fiscal and monetary policies. Commercial and savings banks posted net operating losses during 1988-91, primarily because of losses on loans. Real estate values have dropped 40 percent in the past five years; in 1991, commercial bankruptcies rose 29 percent, and bank stocks fell 79 percent. 3/ The Norwegian Government's response has been

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1/ Kjell Hemberg and Heikki Solttila, "Developments in Bank Profitability," *Bank of Finland Bulletin* (May 1992).

2/ Statements by Governor Kullberg of the Bank of Finland on the closing of the accounts for 1990 and 1991, and "Developments in Bank Profitability," *Bank of Finland Bulletin* (May 1992), review the position of the banking sector.

3/ "European Finance and Investment: Nordic Countries," *Financial Times*, March 23, 1992, p. V.

extensive. 1/ The Government Bank Insurance Fund was set up in March 1991 to support the private funds whose ability to meet bank needs had come into question by the end of 1990. The Government Bank Investment Fund was established in November 1991 to help viable banks obtain new capital. Direct government support through these funds totaled Nkr 15 1/2 billion in 1991, or 2 1/2 percent of GNP. 2/ (More recently, estimates of broader government costs through mid-1992 are on the order of Nkr 24 billion.) Although economic activity remains very weak, there was some improvement in early 1992.

Adjustments in the Swedish financial system have also been substantial, although not on the scale of those in Finland and Norway. The stock of private sector loans at banking institutions grew 140 percent in the second half of the 1980s, rising from 92 percent of GNP in 1985 to 140 percent by the end of 1990. 3/ Credit losses at financial institutions in 1991 amounted to Skr 48 billion, or 3.4 percent of GDP. 4/ Special problems at two large banks have elicited government loans and infusions of capital. The government controls and has restructured one bank and intends to privatize it when conditions improve. Operating profits in the financial system in 1992 continue to be weakened by severe credit losses, even at the most profitable institutions.

Japan entered the 1980s with a tightly regulated, heavily client-based financial system. Interest rate regulations, as well as relatively limited development of money and corporate debt markets in the 1980s, constrained arbitrage possibilities. The pricing and allocation of funds were therefore not fully market-determined. Reform measures since 1984 have been extensive--including liberalization of interest rates on deposits; easing of restrictions on large time deposits, certificates of deposits, and money market certificates; and the introduction of markets for commercial paper, futures and options, and offshore transactions. The associated declines in the portions of household and business deposits held at banks, and in borrowing from banks, have been more pronounced in Japan than elsewhere. Recent legislative reforms have further lowered barriers between banking and securities business, permitting banks to establish subsidiaries that provide brokerage services and allowing securities firms to establish banking subsidiaries.

Japanese banks were able initially to withstand the loss of franchise value without measurable changes in their policy toward risk taking. City banks were able to maintain equity earnings through a combination of increased leverage (capital-asset ratios at both city and regional banks

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1/ "Policies in Relation to the Norwegian Banking Sector," *Norges Bank Economic Bulletin* (1991/3).

2/ Address by Governor Skanland to the Supervisory Council of Norges Bank, February 20, 1992, in *Norges Bank Economic Bulletin* (1992/1).

3/ IMF, *International Financial Statistics*.

4/ *Financial Times*, March 5, 1992, p. 24.

declined through the mid-1980s); increased noninterest income and reduced noninterest expense; and innovative responses to changes in customer needs.

An important factor easing the transition of the banking system in Japan was the exceptional strength in equity and property markets (to which bank activity had contributed). Between 1982 and their peak in 1989, inflation-adjusted share prices more than quadrupled. The surge in stock prices expanded bank profits by raising earnings on securities dealings and generating substantial capital gains. In 1989, for example, capital gains on city bank portfolios amounted to ¥20,000 billion, approximately a tenfold increase in before-tax profits. These gains more than compensated for increased costs from the payment of market-based interest rates on deposits. Capital gains provided crucial backing for banks' expansion into real estate and interbank and overseas markets. Capital gains and the ease of equity issues during the boom also had a crucial effect on banks' capital-asset ratios. Because 45 percent of unrealized capital gains may be counted toward Tier II capital under the Basle Accord, at the end of the decade Japanese banks had reached ratios well above the required levels.

From its peak in 1989, the Nikkei stock index has since fallen by 60 percent (38 percent in 1990, 6 percent in 1991, and 28 percent so far in 1992). This decline has meant that capital gains on securities could no longer compensate for reduced earnings elsewhere in bank portfolios. Moreover, the drop has raised concern about the ability of banks to meet the Basle Accord's capital adequacy standards set for March 1993. <sup>1/</sup> Given the state of Japanese equity markets, the only alternative for some banks will be to reduce risk-weighted assets either by curtailing new lending or by securitizing existing loans. So far the retrenchment has occurred primarily in a withdrawal from the international interbank market. In 1991, Japanese banks reduced their international assets by \$90 billion and their international liabilities by \$232 billion.

The direct effects on banks of the decline in the stock market are compounded by other sources of weakness in their portfolios. In the property boom of the mid-1980s, banks increased their lending for real estate both directly and indirectly, with a substantial increase in loans to nonbanks that lent heavily on real estate. The sharp fall in property values clearly puts this portion of the portfolio at risk. The rate and magnitude of Japanese bankruptcies have risen sharply since 1989, with individual bankruptcies in 1991 doubling over the previous year. Estimates of problem bank loans range from an official total of ¥7,000 billion to ¥8,000 billion, to unofficial estimates of between ¥42,000 billion and ¥53,000 billion. Information on bank profitability is difficult to obtain, but the credit quality of Japan's leading banks may remain under pressure

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<sup>1/</sup> Banks initially compensated for some of the loss in revaluation reserves by issuing subordinated debt, but this outlet is limited: such debt may not exceed 50 percent of Tier-I capital.

for most of the 1990s. 1/ Bank stock prices have fallen even further than overall stock prices.

The dramatic decline in trading volume on the Japanese stock market has led to substantial net losses at the major securities firms: of the top 25 brokerage houses, 20 have reported before-tax losses in fiscal 1991. This is of concern because of potential customer losses and because securities houses rely heavily on banks for short-term liquidity needed in their market-making activities. Life insurance companies, Japan's largest institutional investors, reported the lowest post-war growth of assets for the year ending March 1992. The sluggish growth is attributed in part to demographic factors and in part to poor returns on investments. Insurance companies had moved aggressively into the domestic loan market in 1991, thereby replacing some of the business lost by banks. Their continued strength will be important in maintaining the flow of funds as the role of banks continues to shrink.

The earlier surge in the stock market, and the declining role of banks in corporate funding, have weakened the stability of the system of cross shareholdings. Roughly two thirds of the shares of most listed companies are held by other companies, and financial institutions in particular hold almost half of all outstanding shares. These holdings solidify links between corporations and banks that lower the cost of debt. The higher debt-equity ratios of Japanese corporations compared with U.S. corporations, lower observed rates of bankruptcy, and lower cost of capital are due in part to this system. If the system unwinds--and there is some evidence of this occurring--then other mechanisms will have to replace the oversight and control exercised by banks as joint debt and equity holders in corporations. In the longer term, corporate structure and the cost of capital are likely to change significantly in response to the changing role of banks in the financial system.

##### 5. Global risks

Financial deregulation and liberalization have led to heightened competition, greater risk taking, and a shift from traditional banking toward new institutions and markets. A motivation for this effort was a desire to increase the efficiency and availability of financial services. These structural changes contributed to the economic expansion in many countries during the 1980s, with rapid growth in aggregate lending by financial institutions. The benefits from these changes led to a significant increase in financial activity, increased access to credit for both households and enterprises, and significant increases in rates of remuneration on deposits. These positive features of financial liberalization were also accompanied, however, by speculative booms in real estate markets and stock markets (in some cases) and by asset price

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1/ According to a report by Moody's rating agency: "The Future of the Japanese Banking Industry," New York, June 1992.

inflation. In the nonfinancial sectors of the economies experiencing these booms, there was an increase in private nonfinancial debt that far exceeded the growth of GDP. Some of this increase in leverage was appropriate, and there most likely have been gains in economic efficiency. In retrospect, however, additional factors came into play, and monetary policy may not have taken into account the new environment at a sufficiently early stage. In the event, the debt expansions in some industrial countries, and the corresponding process of asset accumulation, turned out to be excessive.

Sharp adjustments in asset prices have reduced the capital value of many financial institutions--placing some financial systems in fragile positions--and financial systems worldwide are now engaged in a process of retrenchment. Although recent cyclical developments have contributed to this process, and have also triggered adjustments in the private nonfinancial sectors, the retrenchment in financial systems is a natural consequence of structural changes that have required financial institutions to redress the scale and scope of their domestic and global operations. Capital adequacy requirements and voluntary efforts to correct earlier trends are likely to provide the discipline for this contraction.

The retrenchment, however, may have implications for macroeconomic developments in the short term. Financial institutions are still reacting to high delinquency rates, loan losses, property foreclosures, and in some cases a decline in stock prices. Cautious and restrictive lending practices are likely to continue where they have occurred, and this in turn may slow the pace of economic growth in industrial countries. Redressing the excesses of the 1980s is necessary and will in the longer term be beneficial. Policymakers should be mindful not to overreact to what is, in effect, a return to normal and prudent lending practices.

Some countries have already had to respond to crisis situations. Costly institutional changes have been implemented in the savings and loan industry in the United States--once in early 1980 and again more recently--and in the financial systems in the Nordic countries. These experiences would suggest that the timing and scope of reform efforts should be shaped, among other institutional factors, by the nature of existing regulations, the size of the role played by banks (that is, institutions with access to central bank funds), the extent of the nonbank financial sector, and the extent of supervision. A lesson from the recent U.S. experience is that poor incentive structures faced by financial institutions, coupled with inadequate supervision can eventually result in financial crises. This lesson has been reinforced by experience in the Nordic countries: it is costly to liberalize a financial system comprehensively and quickly when it is dominated by one type of institution with few if any alternative sources of funds; moreover, the removal of credit and interest rate regulations should take into account the tax structure and the readiness of supervisory authorities.

In Japan, adjustments in both nonfinancial and financial sectors of the economy to asset price changes have been relatively small, and current

growth projections assume that this situation will continue. The continued weakness in asset prices could pose an important risk to the outlook for private consumption and investment spending, however. In the financial sector, changes in asset prices have placed both large and small banks, and especially the nonbanks, in relatively fragile financial positions at a time when competition is intensifying and when profit margins are low.

Medium-Term Baseline Projections and Alternative Scenarios 1/

The medium-term projections in the *World Economic Outlook* are conditional on several technical assumptions and thus are not necessarily forecasts of most likely outcomes. These assumptions include: unchanged policies, except for measures already announced and likely to be implemented; constant real effective exchange rates, except for bilateral rates in the ERM, which are assumed to be constant in nominal terms; and specific projections for interest rates and world oil prices. 2/

1. Baseline scenario for industrial countries

Annual real GDP growth in the industrial countries is projected to pick up from just under 2 percent in 1992 to over 3 percent per annum over the next 5 years (Table 5). This reflects a gradual return toward the level of potential output following the recessions or periods of sluggish growth experienced by most industrial countries in 1991 and 1992. Slack therefore remains in output and labor markets in many countries over the projection period. As a result, there is some further progress on inflation: as measured by the GDP deflator, inflation in the industrial countries is projected to fall from its current rate of 3 1/4 percent to 2 3/4 percent by 1997. The decline is particularly marked in Germany, where the inflationary pressures from unification are expected to recede. In Japan and France, output gaps are very small over this period, and therefore little change in inflation is projected.

The cyclical pickup in activity and a continuation of the medium-term policy of fiscal consolidation results in an improved fiscal situation in most countries. For the group, the general government deficit is projected to narrow from 3 percent of GDP in 1992 to 1 1/4 percent in 1997. Among the seven largest countries, the deficit reduction is most marked in the United Kingdom and Canada, both of which are expected to recover from particularly deep recessions. In Germany, the deficit expanded as a result of unification, but the authorities have put a medium-term deficit reduction plan in place. The United States and Italy also have deficit-control plans; if the authorities carry them out, deficits should fall in both countries. Nevertheless, in the United States the federal deficit excluding social security is projected to be 4-5 percent of GDP in 1997. The next section of this annex describes the effects of an illustrative fiscal package designed to balance the federal budget by 1997. In the case of Italy, the deficit is projected to decline to about 4 1/2 percent of GDP by the end of the period, on the assumption that permanent and appropriate measures are passed in line with the new budget targets adopted by the council of ministers in late

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1/ Questions relating to this Annex may be addressed to Mr. Ford (ext. 36358) and Mr. Kumar (ext. 37730).

2/ For detailed assumptions on oil prices, interest rates and the reference period for exchange rates, see "Assumptions" and "Conventions" in the Statistical Appendix.

Table 5. Industrial Countries: Selected Indicators of Economic Performance, 1979-97  
(Changes in percent except where otherwise noted)

	Average 1979-88	1989	1990	1991	1992	1993	Average <sup>1</sup> 1994-97
<b>All industrial countries</b>							
Real GDP/GNP	2.7	3.3	2.5	0.7	1.8	3.1	3.0
Real fixed private investment	3.0	5.6	2.7	-2.8	0.6	4.0	5.0
Real total domestic demand	2.7	3.4	2.2	0.5	1.8	3.1	3.1
GDP/GNP deflator	5.8	4.1	4.1	3.9	3.2	3.1	2.7
General government balance (in percent of GDP/GNP) <sup>2,3</sup>	-3.0	-1.0	-1.7	-2.3	-3.0	-2.5	-1.0
Current account balance (in percent of GDP/GNP) <sup>3</sup>	-0.4	-0.6	-0.6	-0.1	-0.2	-0.3	-0.1
<b>Major industrial countries</b>							
Real GDP/GNP	2.7	3.3	2.5	0.8	1.8	3.2	3.0
Real fixed private investment	3.0	5.1	3.1	-2.7	0.8	4.2	5.0
Real total domestic demand	2.8	3.2	2.3	0.5	1.8	3.3	3.1
GDP/GNP deflator	5.5	3.9	3.8	3.8	3.1	3.0	2.6
General government balance (in percent of GDP/GNP) <sup>2,3</sup>	-2.9	-0.9	-1.6	-2.1	-2.9	-2.3	-1.0
Current account balance (in percent of GDP/GNP) <sup>3</sup>	-0.3	-0.5	-0.6	-0.1	-0.2	-0.3	-0.3
<b>United States</b>							
Real GDP	2.5	2.5	1.0	-0.7	2.1	3.4	2.9
Real fixed private investment	1.8	0.4	-1.6	-7.6	2.0	5.4	6.1
Real total domestic demand	2.6	1.9	0.5	-1.3	2.1	3.6	2.9
GDP deflator	5.6	4.4	4.1	3.7	2.7	3.0	2.8
General government balance (in percent of GDP) <sup>2,3</sup>	-2.3	-1.6	-2.5	-3.0	-4.1	-3.1	-1.9
Current account balance (in percent of GDP) <sup>3</sup>	-1.6	-2.0	-1.7	-0.2	-0.9	-1.2	-1.3
<b>Japan</b>							
Real GDP	4.1	4.7	5.2	4.4	1.9	3.5	3.5
Real fixed private investment	5.9	12.6	10.7	3.1	-0.6	3.8	4.3
Real total domestic demand	3.8	5.8	5.4	3.0	1.6	3.8	3.7
GDP deflator	2.0	1.9	2.1	1.9	1.7	1.9	1.9
General government balance (in percent of GDP) <sup>2,3</sup>	-2.2	2.5	3.0	3.0	2.7	2.7	2.3
Current account balance (in percent of GDP) <sup>3</sup>	1.8	2.0	1.2	2.2	2.8	2.4	2.6
<b>Germany</b>							
Real GNP	1.8	3.8	4.5	0.9	1.9	2.8	3.1
Real fixed private investment	1.7	7.4	9.7	7.4	3.3	4.5	4.0
Real total domestic demand	1.6	2.6	4.5	3.8	2.1	2.4	2.8
GNP deflator	3.2	2.6	3.4	5.1	5.3	4.5	2.9
General government balance (in percent of GNP) <sup>2,3</sup>	-2.3	0.2	-1.7	-2.8	-3.2	-2.5	-1.6
Current account balance (in percent of GNP) <sup>3</sup>	1.5	4.8	2.9	-1.2	-0.9	-0.2	1.1
<b>France</b>							
Real GDP	2.2	4.1	2.2	1.2	2.2	2.6	3.0
Real fixed private investment	1.3	7.2	4.7	-2.5	0.7	2.2	4.1
Real total domestic demand	2.3	3.7	2.6	0.9	1.8	2.3	2.9
GDP deflator	7.8	3.2	3.1	2.8	2.8	2.7	2.7
General government balance (in percent of GDP) <sup>2,3</sup>	-2.1	-1.1	-1.4	-2.1	-2.2	-2.1	-1.6
Current account balance (in percent of GDP) <sup>3</sup>	-0.5	-0.5	-0.8	-0.5	-0.2	-0.3	-0.2
<b>Italy</b>							
Real GDP	2.7	2.9	2.2	1.4	1.3	1.5	2.3
Real fixed private investment	1.5	3.8	5.8	0.9	0.4	1.0	2.9
Real total domestic demand	3.0	2.8	2.4	2.3	2.0	2.1	2.6
GDP deflator	12.4	6.2	7.5	7.3	5.5	4.8	3.5
General government balance (in percent of GDP) <sup>2,3</sup>	-10.8	-9.9	-10.9	-10.2	-10.4	-9.3	-4.4
Current account balance (in percent of GDP) <sup>3</sup>	-0.6	-1.2	-1.3	-1.8	-2.0	-2.4	-2.4
<b>United Kingdom</b>							
Real GDP	2.3	2.3	1.0	-2.2	0.2	3.0	2.8
Real fixed private investment	5.6	5.0	-3.7	-10.9	-4.9	3.8	4.1
Real total domestic demand	2.9	3.3	-0.1	-3.1	0.9	2.9	3.0
GDP deflator	8.2	7.1	6.4	6.8	5.1	3.3	2.7
General government balance (in percent of GDP) <sup>2,3</sup>	-2.4	1.2	-0.8	-2.1	-5.1	-5.8	-1.7
Current account balance (in percent of GDP) <sup>3</sup>	0.3	-4.0	-2.8	-0.8	-1.4	-1.5	-2.1
<b>Canada</b>							
Real GDP	3.2	2.5	0.5	-1.5	1.8	4.8	4.0
Real fixed private investment	5.9	5.2	-4.6	-4.0	0.2	5.0	7.9
Real total domestic demand	3.4	3.8	-0.2	-0.5	0.8	4.5	3.9
GDP deflator	6.2	4.7	3.0	2.7	2.1	2.3	1.8
General government balance (in percent of GDP) <sup>2,3</sup>	-4.4	-3.1	-3.8	-5.5	-4.7	-3.7	0.8
Current account balance (in percent of GDP) <sup>3</sup>	-0.9	-3.2	-3.3	-3.9	-2.8	-2.5	-2.5
<b>Other industrial countries</b>							
Real GDP	2.3	3.7	2.5	0.5	1.8	2.4	2.9
Real fixed private investment	2.9	8.7	0.5	-3.8	-0.7	3.0	4.8
Real total domestic demand	2.1	4.7	2.2	0.1	1.6	1.8	2.8
GDP deflator	7.5	5.8	5.7	4.9	3.9	3.7	3.5
General government balance (in percent of GDP) <sup>2,3</sup>	-3.5	-1.6	-2.0	-3.4	-3.9	-3.3	-1.1
Current account balance (in percent of GDP) <sup>3</sup>	-1.0	-1.2	-0.8	-0.4	-0.5	-0.2	0.7

<sup>1</sup> These projections are based on the assumptions of unchanged policies and constant real exchange rates and oil prices.

<sup>2</sup> National account basis.

<sup>3</sup> The last column refers to 1997.

July. Strict adherence to the 1993 budget commitment will be an essential start on the fiscal consolidation needed for the medium-term. Still further measures would have to be identified and implemented to bring the deficit down to 3 percent Maastricht criteria. In the absence of decisive action to implement the government's 1993-95 medium-term plan, the deficit would quickly reach unsustainable levels. The government's own latest projections show that the deficit would rise above 18 percent of GDP by 1995 without its proposed corrective measures. In Japan and France, which have relatively healthy public finances, little change in the deficit is projected.

The reduction in deficits provides room for higher investment rates without a significant deterioration in current accounts. Fixed investment is projected to rebound strongly from the low levels seen in 1991 and 1992. In France and Canada, the current account deficits are projected to narrow by 1997 and Germany is projected to have a surplus by then. The deficit is likely to deteriorate somewhat in the United States and the United Kingdom, however, as the recovery boosts imports and factor income falls. Italy is also projected to have a widening deficit, largely because its inflation rate remains well above that of its trading partners, implying a steady erosion of competitiveness.

2. Alternative scenario with a U.S. fiscal adjustment package

The impact of a comprehensive fiscal adjustment package on the United States and the rest of the world was examined using MULTIMOD, the Fund's multi-country macroeconomic model and the developing country adjustment model. This fiscal package, which is purely illustrative, involves measures whose first-round effects--that is those that do not take account of induced effects resulting from changes in activity--improve the federal fiscal balance by 5 percent of GNP by 1997. <sup>1/</sup> The fiscal package is assumed to be introduced in equal installments over the five year period 1993-97. Half the yield is assumed to come from expenditure cuts and the balance is assumed to consist equally of increases in indirect taxes and cuts in entitlements (the latter are equivalent to increases in direct taxes in MULTIMOD). The monetary authorities are assumed to accommodate the first round effects of indirect taxes on domestic prices, but not to accommodate the second round effects.

Table 6 shows the effects of this package, measured as deviations from baseline values. Reduced government spending lowers aggregate demand directly, while higher taxes reduce the level of disposable income which in turn leads to lower consumption. At the same time, fiscal retrenchment lowers real long-term interest rates and results in a depreciation of the

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<sup>1/</sup> This package contains many of the elements suggested by the Congressional Budget Office in Reducing the Deficit: Spending and Revenue Options, February 1992.

Table 6. Simulated Effects of Illustrative  
U.S. Fiscal Consolidation Package

(Percentage deviation from baseline unless otherwise noted)

	1993	1995	1997	2000
United States				
Real GDP	-0.2	-0.6	-0.6	0.7
Real investment	0.2	0.7	2.3	3.8
Absorption deflator	0.9	1.3	0.8	0.1
Real long-term interest rate <u>1/</u>	0.2	-0.4	-1.0	-0.8
Real effective exchange rate	-3.1	-4.0	-5.7	-5.3
Current account balance <u>2/</u>	7.7	37.9	69.2	98.2
General government balance <u>3/</u>	0.8	2.8	5.0	4.8
Other industrial countries				
Real GDP	0.1	0.3	0.3	0.4
Real investment	1.1	2.4	2.7	2.3
Absorption deflator	-0.4	-0.6	-1.0	-1.0
Real long-term interest rate <u>1/</u>	-0.3	-0.4	-0.5	-0.2
Real effective exchange rate	0.8	1.2	1.6	1.5
Current account balance <u>2/</u>	-1.6	-33.6	-64.6	-88.7
Net debtor countries				
Real GDP	0.4	0.5	0.5	0.5
Export volume	0.7	0.7	0.7	1.1
Debt ratio <u>4/</u>	-2.5	-2.8	-2.5	-2.8
Debt-service ratio <u>4/</u>	-0.4	-0.2	-0.7	-1.2
Current account balance <u>4/</u>	-0.2	0.4	0.3	0.1

1/ In percentage points.

2/ In billions of U.S. dollars.

3/ In percent of GDP.

4/ In percent of exports of goods and services.

real exchange rate. Investment is stimulated by lower real interest rates, and real net exports rise in response to the depreciation in the exchange rate. Overall, real output is lower than it would be in the absence of the fiscal package from 1993 to 1997, but recovers to the baseline level in 1998 and rises to nearly 3/4 percent above the baseline by the year 2000. 1/ The current account improves throughout the period, with the improvement reaching \$98 billion by the year 2000. Because the lower current account deficits lead to an improved net factor income position, GNP rises more than GDP, and is about 1 percent above baseline by the year 2000. The direct impact of the indirect taxes is to raise the absorption deflator by a maximum amount of 1 1/4 percent in 1995. The fiscal consolidation package leads to a substantial improvement in the government balance; by 1997 the general government balance improves by 5 percent of GDP compared to the baseline as the decline in interest payments generated by the lower deficits offsets the lower revenue and higher government spending induced by the lower path of output over the period 1993-97.

The impact of this illustrative set of fiscal measures on the rest of the world is small, but positive. Activity in all other industrial countries strengthens slightly relative to the medium-term baseline projections. The real exchange rate appreciates in these countries, which together with the decline in exports to the United States results in a deterioration in their current account position. However, this negative impact on demand is more than offset by higher investment stimulated by a decline in the real long-term interest rate. Moreover, in net debtor countries output is higher than in the medium-term baseline projections on account of higher export volume and lower debt-service payments, and the current account improves over most of the period relative to the baseline.

It should be noted that MULTIMOD is a forward-looking model and that, therefore, economic agents are assumed to anticipate the entire path of fiscal measures and act on the expectation that the measures will be fully implemented as planned. Because the package is viewed as fully credible, it has the effect of reducing real long-term interest rates almost immediately. These credibility effects operate to crowd in investment spending quickly and thereby to moderate the short-run negative effect on output of the fiscal measures.

In current circumstances, given the high structural deficit in the United States, the persistence of high long-term interest rates, and the relatively low levels of confidence, it is possible that a credible package of fiscal measures to reduce the deficit over the medium term could have substantial positive effects on confidence. Such an improvement in confidence--not captured in the model--would be likely to lead to an increase in demand that would reduce the adverse short-term impact on output

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1/ The pattern of these deviations is sensitive to the pattern of the fiscal changes. For example, if the measures were front loaded, the initial shortfall would be greater, but output would return to baseline earlier.

over and above that already captured in MULTIMOD. Such an assumption was adopted for the purpose of the fiscal scenario reported in the recent Staff Report on the Article IV Consultation with the United States (see SM/92/149). Conversely, given the fact that there has been little progress in addressing the U.S. fiscal problem, the opposite could occur, namely, that such a fiscal package would not be immediately regarded as credible. In this case, interest rates would decline less than suggested by MULTIMOD, and the short-run output losses resulting from the fiscal measures would be larger.

### 3. Baseline scenario for the developing countries

In developing countries with IMF-supported adjustment programs, the medium-term projections assume that the policies underlying the programs will be implemented. <sup>1/</sup> More generally, many countries have undertaken or have begun to put in place structural reforms that are expected to raise long-term growth prospects. The continued success of these reforms underpins the projections, particularly for countries in the Western Hemisphere and Africa.

Nonfuel commodity prices are assumed to increase, on average, by 4 1/2 percent a year in 1994-97, and exchange rates are assumed to remain unchanged in real terms. Given projected price developments in industrial countries, these assumptions imply little change in the terms of trade of developing countries in 1994-97. Total financing flows to the net debtor developing countries are expected to increase in the medium term as recently resumed commercial bank lending continues, in particular to several Latin American countries; foreign direct investment picks up; and flight capital returns. The reconstruction in the Middle East following the Gulf war, which will boost growth in 1992-93, is not assumed to have any appreciable impact in the medium term.

On the basis of these assumptions and the medium-term projections for industrial countries, real GDP growth in net debtor developing countries as a group is projected to average 5 3/4 percent a year in 1994-97, which is a considerably better performance than in 1988-91 (Table 7). This improvement can be traced to a marked pickup in the countries that have recently experienced debt-servicing difficulties; growth in this group is expected to rise to 5 1/2 percent in 1994-97, compared with only about 1/2 percent in the four years up to 1991; inflation is projected to fall to 18 percent; and investment-GDP ratios to rise by over 3 percentage points compared with the 1988-91 levels. In countries without debt-servicing difficulties, growth is expected to remain high over the medium term.

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<sup>1/</sup> As of the end of May 1992, there were 44 countries with IMF arrangements (excluding Eastern European countries). Of these, 19 had stand-by arrangements, 5 extended arrangements, 6 SAF arrangements and 14 ESAF arrangements.

Table 7. Net Debtor Developing Countries: Indicators of Economic Performance by Financial Criteria

(Annual Averages, except as noted)

	1984-87	1988-91	1992-93	1994-97
<u>Net Debtor countries</u>				
	(Percent changes or percent of GDP)			
Real GDP	5.2	3.3	5.7	5.7
Real GDP per capita	3.0	1.3	3.5	3.7
Consumer prices	40.2	76.4	44.0	22.2
Investment ratio	23.6	25.0	26.4	26.7
Export volume	8.3	7.9	9.7	10.1
Import volume	3.5	9.2	10.3	9.1
Terms of trade	-2.8	-0.5	-0.4	0.2
	(In billions of U.S. dollars)			
Trade balance	-1.4	-12.9	-57.7	-47.9
Current account balance	-37.0	-33.4	-68.8	-61.7
Non-debt creating flows, net	9.5	14.9	0.1	0.4
Official transfers	8.9	9.4	-13.7	-6.3
Direct investment, net	9.4	20.8	10.0	3.3
Total net external credit	35.1	51.6	80.9	74.2
Memorandum				
Net official credit <u>1/</u>	31.6	32.2	27.5	22.7
Net bank credit <u>2/</u>	6.5	18.1	29.6	37.5
	(In percent of exports of goods and services)			
Total external debt <u>3/</u>	198.6	150.1	130.0	95.9
Debt-service payments	25.4	18.8	17.1	13.7
Of which: Interest payments	14.0	9.2	8.0	6.3
<u>Countries with recent debt-servicing difficulties</u>				
	(Percent changes or percent of GDP)			
Real GDP	3.4	0.6	5.4	5.6
Real GDP per capita	0.9	-1.6	2.8	3.3
Consumer prices	76.2	184.6	87.0	17.5
Investment ratio	18.3	19.3	21.2	22.6
Export volume	3.1	3.1	7.1	7.4
Import volume	-1.8	3.9	8.0	6.3
Terms of trade	-4.5	-1.7	-0.8	0.5
	(In billions of U.S. dollars)			
Trade balance	19.5	15.2	-7.3	2.5
Current account balance	-25.0	-26.0	-39.1	-40.6
Non-debt creating flows, net	10.0	14.3	0.6	0.4
Official transfers	8.4	7.9	-12.2	-13.3
Direct investment, net	10.2	22.2	10.3	5.8
Total net external credit	18.4	26.8	34.3	32.2
Memorandum				
Net official credit <u>1/</u>	20.7	25.1	14.9	9.9
Net bank credit <u>2/</u>	-0.1	6.3	6.9	13.0
	(In percent of exports of goods and services)			
Total external debt <u>3/</u>	338.6	298.2	265.9	206.2
Debt-service payments	35.7	28.7	32.1	26.0
Of which: Interest payments	22.4	16.1	16.7	12.8
<u>Countries without debt-servicing difficulties</u>				
	(Percent changes or percent of GDP)			
Real GDP	7.2	5.9	5.9	5.8
Real GDP per capita	5.2	4.0	4.1	4.1
Consumer prices	9.8	12.3	12.9	25.4
Investment ratio	29.0	30.0	31.0	29.8
Export volume	12.1	10.4	10.8	11.1
Import volume	6.7	11.6	11.2	10.1
Terms of trade	-1.6	0.1	-0.2	0.1
	(In billions of U.S. dollars)			
Trade balance	-20.9	-28.1	-50.4	-50.3
Current account balance	-11.9	-7.5	-29.7	-21.1
Non-debt creating flows, net	9.1	15.4	-0.3	0.4
Official transfers	9.3	10.9	-15.0	-0.8
Direct investment, net	8.8	19.7	9.7	1.0
Total net external credit	16.6	24.8	46.6	42.0
Memorandum				
Net official credit <u>1/</u>	10.8	7.1	12.5	12.6
Net bank credit <u>2/</u>	6.5	11.7	22.7	24.5
	(In percent of exports of goods and services)			
Total external debt <u>3/</u>	115.9	85.3	75.3	56.8
Debt-service payments	18.1	13.8	11.0	9.0
Of which: Interest payments	8.0	5.7	4.5	3.9

1/ Estimate of long-term borrowing from official creditors. See footnotes to Table A40 in the Statistical Appendix.

2/ Estimate of net lending from commercial banks. See footnotes to Table A40 in the Statistical Appendix.

3/ End-of-period, excluding liabilities to the Fund.

In the Western Hemisphere, annual GDP growth is projected to rise to about 5 percent, which would imply per capita growth of nearly 3 percent compared with a decline of 1 percent a year during 1988-91 (Table 8). The sharp projected reduction in inflation, to around 17 percent in the medium term, presupposes a continuation of the macroeconomic adjustment and structural reforms implemented in several countries in recent years. A continuation of capital inflows, by complementing domestic saving, will also be important for medium-term growth.

In Africa, growth is projected to increase to 4 percent in 1994-97, assuming that the serious drought in southern Africa ends, civil strife is reduced in several of the countries, and the region's terms of trade remain unchanged. The projected improvement in this region is also predicated on the success of structural reforms, which should increase investment and productivity, especially in the export sectors. In the Middle East, the high growth in 1992-93 because of reconstruction of war damage is expected to be followed by more sustainable increases in real output, averaging 7 percent in 1994-97. Real output in Asia is projected to increase by about 6 1/4 percent on average in 1994-97, about the same as in 1992-93. The continuing high growth rates in Asia reflect the successful implementation of policies to liberalize trade and the financial system, a continuation of very high investment rates, and increases in export volumes of nearly 11 percent a year.

The combined current account deficit of the net debtor developing countries is projected to decline from an estimated annual average of \$69 billion in 1992-93 to an annual average of \$62 billion in 1994-97 (Table 7). This is accounted for by an \$8 billion decline in the deficit of countries without recent debt-servicing difficulties and reflects a tapering off in the rate of growth of capital goods imports in recent years. In the countries with recent debt-servicing difficulties, the current account deficit is likely to be broadly unchanged in the medium term.

For all net debtor countries, total net external credit is projected to rise from an average of \$52 billion a year in 1988-91 to \$81 billion in 1992-93, and then to fall to about \$74 billion in 1994-97. The Latin American countries, which have had their access to private capital markets restored in the last two years, account for a large part of the increase. In addition, large flows of portfolio and foreign direct investment to countries such as Korea, Malaysia, and Thailand are expected to continue.

The aggregate debt-export ratio of the developing countries is projected to decline to about 96 percent by end-1997, about half of the 1986 peak. This is due to debt reductions undertaken as part of the debt strategy as well as improved export performance. Debt-service payments (including interest payments on total debt plus amortization payments on long-term debt) are expected to decline to around 14 percent of export receipts, the lowest since the outbreak of the debt crisis in 1982. This reduction in debt and debt service would support macroeconomic stability and sustainable growth in debtor countries.

Table 8. Net Debtor Developing Countries: Indicators of Economic Performance by Region

(Annual Averages, except as noted)

	1984-87	1988-91	1992-93	1994-97
<u>Africa</u>				
		(Percent changes or percent of GDP)		
Real GDP	1.9	2.3	2.6	4.0
Real GDP per capita	-1.0	-0.7	-0.1	1.2
Consumer prices	15.5	20.4	23.7	17.1
Investment ratio	19.9	20.7	20.2	21.6
Export volume	2.6	4.0	4.0	4.1
Import volume	-3.5	1.6	4.4	4.7
Terms of trade	-4.5	-2.2	-2.5	0.0
		(In billions of U.S. dollars)		
Trade balance	7.0	5.6	3.3	3.9
Current account balance	-6.1	-5.7	-8.1	-6.8
Non-debt creating flows, net	11.7	10.0	0.7	2.9
Official transfers	14.7	9.1	-6.9	3.5
Direct investment, net	-2.3	15.7	35.3	1.4
Total net external credit	7.3	7.0	9.6	9.5
Memorandum				
Net official credit <u>1/</u>	6.4	8.8	7.8	8.8
Net bank credit <u>2/</u>	0.1	-0.4	-0.9	2.6
		(In percent of exports of goods and services)		
Total external debt <u>3/</u>	244.9	229.9	216.2	179.6
Debt-service payments	27.0	25.6	29.9	23.9
Of which: Interest payments	12.4	11.5	12.9	10.8
<u>Asia 4/</u>				
		(Percent changes or percent of GDP)		
Real GDP	7.4	6.3	6.1	6.2
Real GDP per capita	5.5	4.5	4.4	4.4
Consumer prices	10.1	13.1	8.6	6.8
Investment ratio	29.5	30.9	32.6	32.6
Export volume	12.3	11.6	11.3	11.7
Import volume	7.2	13.2	12.0	10.6
Terms of trade	-1.1	0.1	-0.1	0.1
		(In billions of U.S. dollars)		
Trade balance	-13.3	-18.5	-38.5	-36.7
Current account balance	-10.1	-9.9	-30.4	-23.3
Non-debt creating flows, net	12.8	13.9	4.8	1.3
Official transfers	5.4	-3.4	-2.3	-6.9
Direct investment, net	16.7	19.1	6.0	2.4
Total net external credit	14.1	24.6	43.3	39.0
Memorandum				
Net official credit <u>1/</u>	8.8	9.6	9.8	8.6
Net bank credit <u>2/</u>	4.4	11.6	23.0	22.8
		(In percent of exports of goods and services)		
Total external debt <u>3/</u>	104.9	77.9	69.2	52.1
Debt-service payments	15.8	10.7	8.5	7.4
Of which: Interest payments	7.1	4.7	3.7	3.3
<u>Middle East 5/</u>				
		(Percent changes or percent of GDP)		
Real GDP	6.5	-1.5	13.4	7.2
Real GDP per capita	3.6	-3.6	9.4	5.2
Consumer prices	37.7	32.8	36.3	74.0
Investment ratio	21.7	19.0	20.6	20.7
Export volume	12.5	-5.2	14.6	10.9
Import volume	-0.3	-1.3	5.8	7.1
Terms of trade	-5.3	0.2	-0.2	0.5
		(In billions of U.S. dollars)		
Trade balance	-21.8	-21.2	-24.5	-21.6
Current account balance	-12.4	-6.4	-2.5	-0.4
Non-debt creating flows, net	3.1	12.4	-19.2	-18.9
Official transfers	4.1	15.9	-24.3	-29.6
Direct investment, net	-0.8	-7.2	20.9	4.1
Total net external credit	4.9	4.2	4.5	3.0
Memorandum				
Net official credit <u>1/</u>	5.6	2.0	3.4	1.9
Net bank credit <u>2/</u>	2.7	0.7	-0.6	-0.7
		(In percent exports of goods and services)		
Total external debt <u>3/</u>	294.4	284.1	233.4	157.8
Debt-service payments	27.2	27.9	22.5	16.9
Of which: Interest payments	15.3	13.1	11.2	8.8

Table 8 (concluded). Net Debtor Developing Countries: Indicators of Economic Performance by Region

(Annual Averages, except as noted)

	1984-87	1988-91	1992-93	1994-97
<u>Western Hemisphere</u>				
		(Percent changes or percent of GDP)		
Real GDP	3.4	1.0	3.5	5.0
Real GDP per capita	1.3	-1.0	1.5	2.9
Consumer prices	111.5	336.0	128.6	17.0
Investment ratio	18.4	20.2	22.0	23.8
Export volume	2.9	5.7	6.1	7.9
Import volume	2.3	8.3	10.0	6.3
Terms of trade	-4.3	-1.3	-0.1	0.5
		(In billions of U.S. dollars)		
Trade balance	26.7	21.2	1.9	6.6
Current account balance	-8.3	-11.4	-27.8	-31.2
Non-debt creating flows, net	10.8	23.8	7.7	4.2
Official transfers	17.6	6.0	-7.3	0.7
Direct investment, net	5.8	30.5	10.4	4.6
Total net external credit	8.8	15.9	-23.5	22.7
Memorandum				
Net official credit <sup>1/</sup>	10.7	11.8	6.5	3.4
Net bank credit <sup>2/</sup>	-0.8	6.3	8.0	12.7
		(In percent of exports of goods and services)		
Total external debt <sup>3/</sup>	341.1	268.9	242.7	199.8
Debt-service payments	41.8	32.9	36.5	30.3
Of which: Interest payments	27.4	18.4	18.6	14.4

<sup>1/</sup> Estimate of long-term borrowing from official creditors. See footnote to Table A40 in the Statistical Appendix.<sup>2/</sup> Estimate of net lending from commercial banks. See footnotes to Table A40 in the Statistical Appendix.<sup>3/</sup> End-of-period, excluding liabilities to the Fund.<sup>4/</sup> Excludes Taiwan.<sup>5/</sup> Excludes Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

As emphasized above, the medium-term projections for the developing countries assume that adjustment programs remain on track. If, however, the momentum for structural reforms is not sustained and policy slippages emerge, inflation would fall more slowly than in the baseline, with detrimental effects on investment and growth. The effects of these policy slippages on the medium-term projection for the developing countries were examined in a simulation exercise reported in the May 1992 *World Economic Outlook*. <sup>1/</sup> The results of that exercise showed that policy slippages could result in average inflation in developing countries rising about 20 percentage points higher in 1994-97, with the effect concentrated in the Western Hemisphere and in the most heavily indebted countries. Such slippages would also reduce growth in total factor productivity from 2 1/2 percent to 2 percent a year. As a result, the annual average growth of potential output for the countries with IMF-supported programs as a group would fall by about 1 percentage point.

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<sup>1/</sup> See "Policy Slippage Scenario for the Developing Countries," in the May 1992 *World Economic Outlook*, p. 61.

Macroeconomic Effects of Convergence in the European Community 1/

This annex examines the possible macroeconomic consequences of a determined effort by all member states of the European Community to achieve the convergence criteria agreed at Maastricht by 1996. 2/ The analysis suggests that these effects would be strongly influenced by the evolution of interest differentials vis-à-vis Germany. In view of the experience of countries that have achieved a high degree of convergence already, it seems likely that interest differentials would gradually disappear as convergence is achieved. On this assumption, the convergence process would be associated with relatively small adverse effects on output in the short run, with a strengthening of the Community's growth performance by the mid-1990s. This result should be seen against the perspective of the difficulties that may arise in the absence of strong efforts to reduce unsustainable budget deficits, which constitute the main convergence problem, or in the absence of the broader efforts toward economic integration as promoted by the Maastricht agreement and for which convergence is an integral part. In particular, it seems unlikely that output growth could be maintained at an acceptable pace in the absence of these measures.

It cannot be excluded, however, that the interest differentials may reflect a perception by markets that existing parities are misaligned. To the extent that this is the case, the differentials might remain fairly large on the expectation of a final realignment before the permanent fixing of parities and the introduction of a single EC currency. Under these circumstances, the initial adverse effects of increased efforts to converge could be more pronounced, with the benefits from the adjustment efforts emerging only later in the decade. In either case, however, the effects on the rest of the world would be relatively small.

1. Convergence at present

A high degree of convergence of economic policies and performance has been recognized as a condition for exchange rate stability in the EC since the breakdown of the Bretton Woods system of fixed exchange rates in the early 1970s. But little progress was made during that decade as oil price disturbances and differences in policy priorities provided a poor setting for enhanced policy coordination. Since the early 1980s, however, the discipline imposed by the European Monetary System (EMS) has helped to narrow divergences in policy orientation and in inflation performance. This has permitted a significant reduction in the frequency of currency realignments--the last occurred in January 1987--and all EC member states

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1/ Questions relating to this Annex may be addressed to Mr. Larsen (ext. 34793), Mr. Masson (ext. 37483) or Mr. Symansky (ext. 37479).

2/ The discussion summarizes analysis already presented in SM/92/129 and SM/92/129, Supplement 1. The convergence criteria and the process leading to economic and monetary union (EMU) were described in Annex II of the May 1992 *World Economic Outlook*, pp. 52-55.

with the exception of Greece have now joined the exchange rate mechanism (ERM).

At present, on the basis of estimates for 1992, the convergence situation is as follows:

- Three members of the Community--France, Denmark, and Luxembourg--already meet the convergence criteria agreed at Maastricht as conditions for participation in the third and final stage of EMU (see Table 8 in Chapter III).
- Germany, Ireland, the Netherlands, and the United Kingdom are close to meeting the convergence conditions. Ireland's debt to GDP ratio is still well above 60 percent, but other criteria are met; a cautious stance of fiscal policy will be required to establish a clearly declining trend in the debt ratio in accordance with the Maastricht treaty. For the three other countries, inflation rates are within the Maastricht criterion, but some fiscal adjustment is required.
- In the five remaining countries--Belgium, Greece, Italy, Portugal, and Spain--more significant adjustments are necessary if the convergence criteria are to be met. Belgium, Portugal, and Spain have begun to take the necessary measures, and the convergence targets appear to be within reach if their adjustment efforts are sustained. Although some steps have been taken in Greece and Italy, significant additional adjustments to policy remain to be implemented.
- In the European Free Trade Association (EFTA) area, where most countries have applied for EC membership or have indicated their intention to apply in the near future, two countries (Austria and Switzerland) already meet the criteria. Three other EFTA countries (Finland, Norway, and Sweden) need further adjustments to qualify for participation in the third stage of EMU.

For most of the countries that do not meet the convergence criteria, a substantial narrowing of fiscal imbalances will be required, and this is generally the binding constraint. Where divergences in inflation performance are also important, meeting the budget deficit target would help to reduce inflation rates toward the range indicated in the Maastricht agreement. <sup>1/</sup> For those countries with excessive levels of public debt, it will be virtually impossible to meet the 60 percent debt-ratio criterion by 1996. Meeting the deficit criterion, however, is likely to permit a

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<sup>1/</sup> The Spanish convergence plan calls for a reduction of the government deficit to 1 percent of GDP by 1996. The authorities felt that fiscal adjustment beyond the Maastricht criterion would be necessary since structural reforms will take time to contribute to lower inflation.

declining trend in debt ratios, in accordance with the requirements of the treaty. In this context it should be emphasized that the fiscal adjustment needs in the diverging countries to a large extent overstate the effects on macroeconomic developments of the Maastricht criteria, since countries would in any case have had to undertake fiscal adjustment to correct macroeconomic imbalances and to improve their medium-term growth prospects.

## 2. The reference scenario and credibility of exchange rates

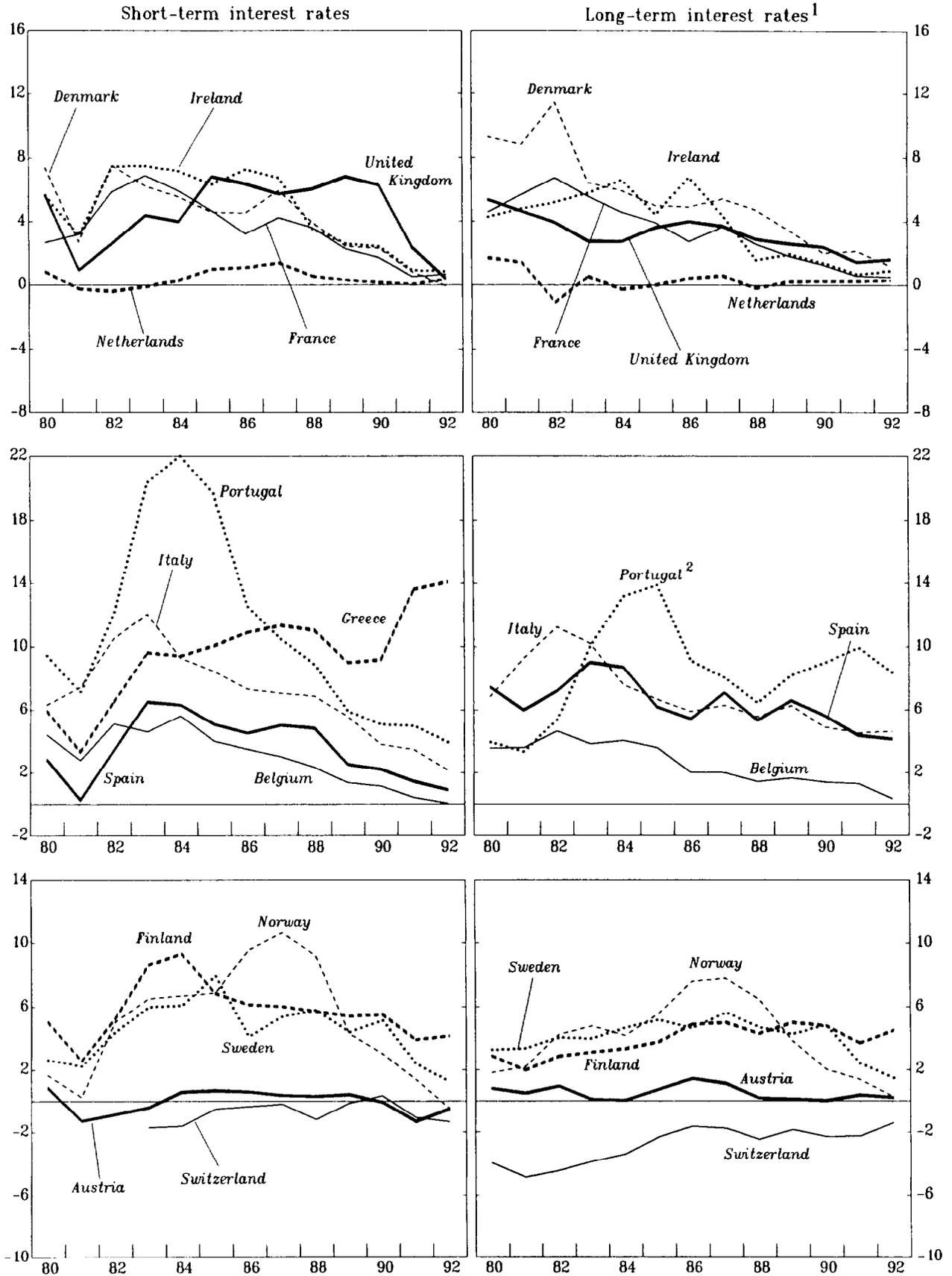
Assessing the effects of policies designed to achieve the necessary degree of convergence requires a view to be taken about the counterfactual reference case and about the related issue of the link between convergence and the credibility of exchange rates. One possibility would have been to use the standard *World Economic Outlook* (WEO) medium-term baseline projections. For two reasons, this was felt not to be appropriate. First, these projections incorporate some policy measures that have already been announced or are judged likely and that tend to improve the degree of convergence--without fully meeting the Maastricht criteria in all cases. Therefore, the WEO projections would not permit an analysis of the effects of achieving the required degree of convergence compared with the status quo. Second, the WEO projections implicitly assume that the credibility of the existing exchange rates in Europe, as reflected in interest rate differentials, is unaffected by the projected rates of inflation and the size of future budget deficits. 1/ Because the credibility of exchange rates is likely to be strongly influenced by the degree of convergence, however, the reference scenario must take an explicit view on the implications for the credibility of exchange rates of the projected degree of convergence.

The credibility of European exchange rates may be measured by interest differentials--especially for longer maturities--vis-à-vis Germany, which has served as a low-inflation anchor for the EMS since the system's inception in 1979. These differentials have narrowed substantially during the past decade for those countries that have achieved a high degree of convergence (Chart 8). In contrast, for Italy, Greece, Portugal, and Spain--though not for Belgium--relatively large premiums vis-à-vis deutsche-mark-denominated assets persist, either because of expectations of future

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1/ This problem is related to the technical assumption of unchanged exchange rates traditionally adopted in the *World Economic Outlook*.

Chart 8. Interest Rate Differentials vis-à-vis Germany



<sup>1</sup> Definitions differ in some cases from definitions used in Table 8 of Chapter III.

<sup>2</sup> The interest rate refers to the pre-tax weighted average yield on treasury bills.



realignments or due to the perceived risk of default. 1/ The recent deterioration in Germany's inflation performance has not affected Germany's position as the de facto anchor in the EMS.

Interest differentials are likely to be mainly due to the risk of changes in exchange rates, part of which is associated with the prospects for convergence and the perceived likelihood of participation in stages of EMU, and part of which may reflect a loss of competitiveness accumulated in the past. The first type of premium can be expected to decline and eventually to disappear with convergence, but the latter might persist or worsen even if convergence is achieved, since markets might anticipate a final realignment before the permanent fixing of exchange rates at the beginning of the third and final stage of EMU. Such a persistence of long-term interest differentials would prevent some countries from meeting all the Maastricht criteria.

The reference scenario assumes that the interest differentials reflect the degree of convergence under unchanged policies. Therefore, in countries that meet the Maastricht criteria, interest differentials vis-à-vis Germany are assumed to be eliminated gradually by 1996 (Table 9). In countries that do not meet the convergence criteria, interest differentials remain unchanged at their initial levels or decline only slightly in response to improved inflation performance. The implied risk premiums reflect the uncertainties about economic and exchange rate policies that would be associated with the possibility of a country being excluded from stage three.

The reference scenario further assumes that fiscal stances are unchanged between 1992 and 1996 in the sense that primary budget deficits are held constant from 1992; some adjustments were made for special circumstances and for cyclical factors. Moreover, rates of inflation are

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1/ The situation of the four countries with relatively large interest differentials differs somewhat. Italy, which has been in the ERM since its inception and in the narrow band for two years, initially saw some narrowing of interest differentials, probably because of increased credibility. But differentials have widened sharply recently, suggesting continuing credibility problems. In the cases of Portugal and Spain, which have joined much more recently and remain in the wide band, current high interest rates partly reflect deliberate government policy in the face of continued high inflation, with sterilized intervention offsetting the resulting capital inflows. Since these two currencies are at the top of the band, there could be substantial exchange rate movements with no realignment. In Greece, current policy is to adjust the exchange rate almost in line with inflation differentials, which seems to account for an interest rate differential on the order of that recently observed. Interest differentials generally widened in reaction to the Danish rejection of the Maastricht treaty, apparently indicating a perception that a failure to ratify the Maastricht agreement would weaken these countries' commitment to converge.

Table 9. Assumptions Underlying the Reference Scenario

	General Government		Consumer Price		Long-Term		Gross Government	
	Balance/GDP 1/		Inflation		Interest Rates 3/		Debt 1/	
	1992	1996 2/	1992	1996	1992	1996	1992	1996
<u>EC Countries</u>								
France	-2.0	-1.8	2.7	2.5	0.6	--	47.6	47
Germany	-3.5	-4.2	3.9	2.5	--	--	42.7	47
Italy	-10.4	-12.0	5.3	5.0	4.3	4.3	108.0	115
United Kingdom	-5.1	-4.3	3.7	2.5	1.0	1.0	34.2	44
Average	-5.0	-5.4	3.9	3.1	1.4	1.2	56.6	62
Belgium	-5.5	-5.3	3.0	3.0	0.8	0.8	133.4	125
Denmark	-1.8	-0.2	2.5	2.5	0.8	--	65.9	55
Greece	-14.6	-18.0	15.2	12.0	13.1	11.0	118.0	120
Ireland	-2.7	-0.5	3.7	3.1	1.2	--	96.0	82
Luxembourg	1.5	2.2	3.1	2.5	--	--	5.8	-1
Netherlands	-3.6	-3.6	3.3	2.5	0.2	0.2	80.0	77
Portugal	-5.2	-2.5	8.5	5.5	8.1	5.3	62.5	55
Spain	-4.5	-4.5	5.8	4.8	3.0	3.0	47.3	51
Average	-4.6	-4.3	5.0	4.1	2.5	2.1	76.0	72
<u>Non-EC Countries</u>								
Austria	-1.9	-1.7	3.8	2.5	0.1	--	55.8	52
Finland	-8.6	-6.6	3.5	4.0	4.5	4.5	25.0	45
Norway	-3.7	-6.0	2.5	2.5	1.1	1.1	48.5	70
Sweden	-3.9	-2.5	2.5	2.5	1.6	--	45.8	49
Switzerland	-1.8	-1.7	4.5	2.5	-1.5	--	33.0	33
Average	-3.7	-3.2	3.6	2.7	0.8	0.8	38.9	45

Note: Estimates shown in this table differ from current WEO projections for reasons discussed in the text of this annex.

1/ General government basis, in percent of GDP.

2/ Assuming an unchanged primary balance and corrected for cyclical factors.

3/ Differential vis-à-vis Germany.

assumed to converge partially because of the discipline placed on monetary policies by membership in the ERM. 1/ The real exchange rates of nonconverging countries continue to appreciate, however, which might eventually increase pressures for a realignment (Chart 9). Finally, as a working hypothesis it is assumed that real GDP in the baseline scenario expands in line with the medium-term WEO projections; for the Community as a whole, the annual growth rate is 2.7 percent over the 1992-96 period.

### 3. Convergence scenarios

Two alternative scenarios show the effects of a gradual implementation of policy measures to achieve the required degree of convergence of budget deficits and inflation rates. Where countries have announced more ambitious budgetary objectives, it is assumed that these targets will be reached (Table 9). The required degree of fiscal adjustment is achieved evenly through expenditure cuts and increases in taxes net of transfers and subsidies. 2/

In scenario 1, the process of convergence gradually eliminates the risk of nonparticipation in stage three of EMU, thereby removing the assumed principal source of the interest differentials in the reference case. The reduction in interest rates reduces debt-servicing costs and thereby helps to limit the required degree of fiscal contraction. It also considerably dampens the short-term contractionary impact of fiscal consolidation by "crowding in" interest-sensitive components of private demand. Thus, even in the case of a country such as Italy with large convergence problems in 1992, the results suggest that the initial adverse effects on activity would be relatively contained (Table 10 and Chart 10). As the adjustment is completed, the initial costs of convergence are offset by higher growth relative to the baseline as a result of increased investment. As a result, the effect on average output growth over the 1993-96 adjustment period is zero. It appears on the basis of this scenario that all countries would meet the Maastricht inflation targets. Finally, the results also show significant reductions in debt-GDP ratios--even though for some countries the 60 percent target would be reached only gradually, at some point after 1996. 3/

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1/ The analysis assumes that Greece will join the ERM in 1994.

2/ The simulations assume some front loading of deficit reduction in order to make substantial progress toward achieving the debt target. The assumed path for the deficit relative to baseline is 30 percent of the targeted cut in 1993, 50 percent in 1994, 75 percent in 1995, with the adjustment being completed by 1996.

3/ The persistence of high debt-GDP ratios might delay the complete elimination of interest premiums to the extent that these incorporate the risk of default.

Table 10. Scenario 1: Convergence with Risk Premium Adjustment

(Percentage point deviation from reference scenario)

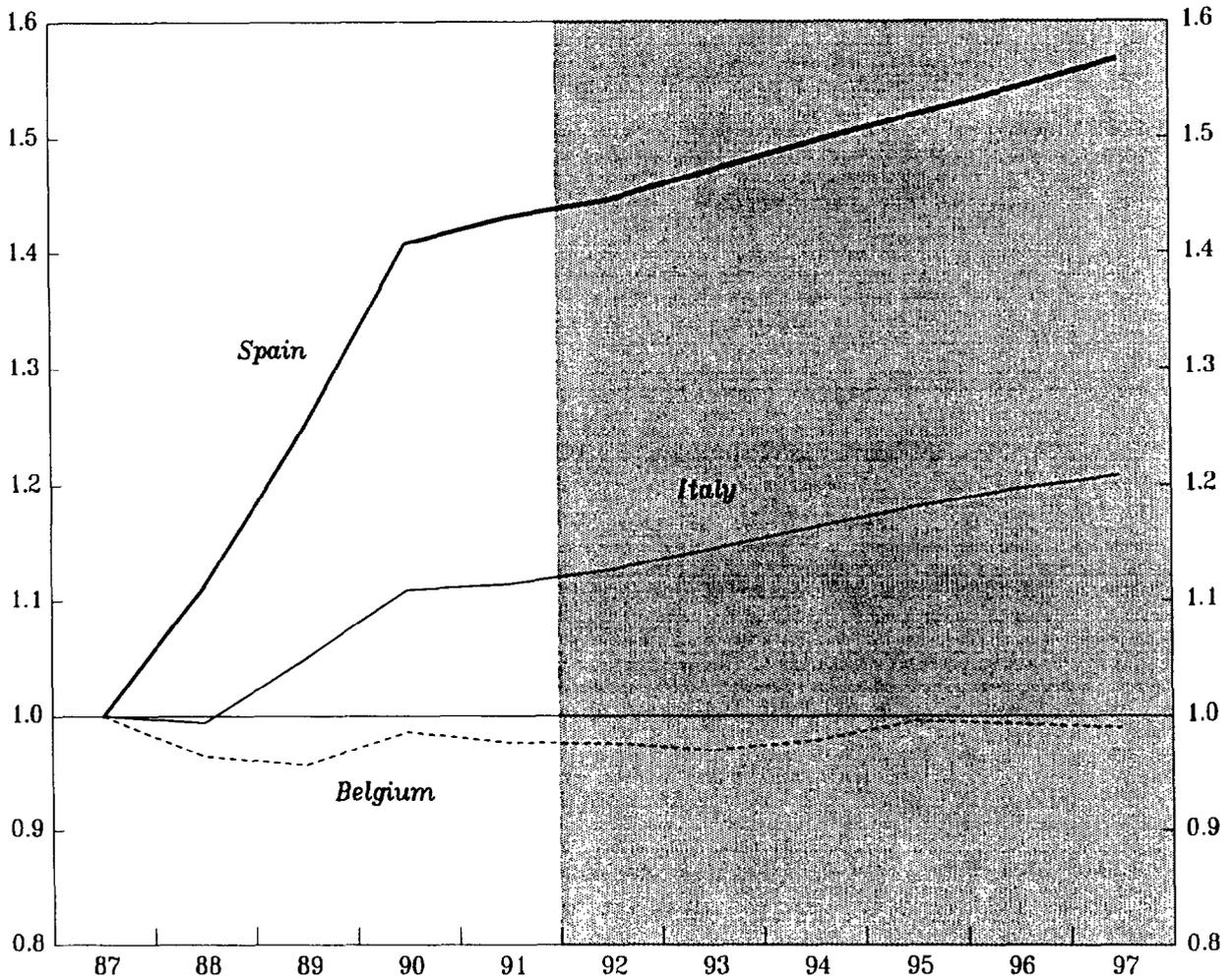
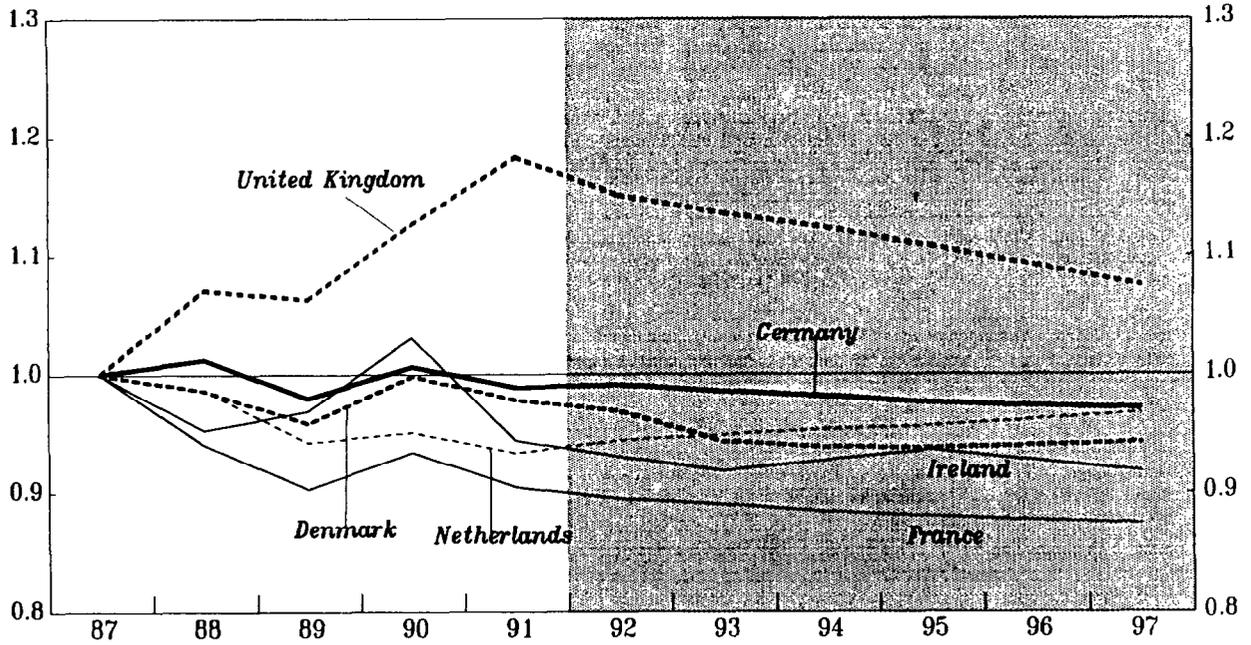
	Level of Real GDP 1993-96	Inflation Rate 1995-96	Long-Term Interest Rate in 1996	Government Deficit/GDP in 1996	Government Debt/GDP in 1996
Germany	-0.4	-0.1	-0.3	-2.4	-5.5
France	--	0.2	-0.3	-0.6	-1.6
Italy	-1.1	-1.9	-4.4	-9.1	-15.3
United Kingdom	--	0.2	-1.2	-2.0	-5.1
Other EC countries	-0.2	-0.3	-2.3	-5.0	-11.9
EC as a whole	-0.4	-0.3	-1.8	-3.8	-8.6
Non-EC Europe	-0.1	--	-1.1	-2.0	-4.9
Europe as a whole	-0.3	-0.3	-1.7	-3.6	-8.2
Other industrial countries	--	-0.1	-0.3	0.1	-0.1
Developing countries	--	-0.1	...	...	...

Table 11. Scenario 2: Convergence without Risk Premium Adjustment

(Average percentage deviation from reference scenario)

	Level of Real GDP 1993-96	Inflation Rate 1995-96	Long-Term Interest Rate in 1996	Government Deficit/GDP in 1996	Government Debt/GDP in 1996
Germany	-0.3	-0.3	-1.0	-2.4	-5.5
France	-0.1	0.1	-1.0	-0.6	-1.5
Italy	-2.8	-3.9	-1.0	-9.1	-5.1
United Kingdom	-0.2	0.2	-1.0	-2.0	-4.9
Other EC countries	-0.6	--	-1.0	-5.0	-11.6
EC as a whole	-0.8	-0.5	-1.0	-3.8	-7.9
Non-EC Europe	-0.2	--	-1.0	-2.0	-4.8
Europe as a whole	-0.7	-0.4	-1.0	-3.6	-7.5
Other industrial countries	--	-0.3	-0.7	0.1	-0.3
Developing countries	--	-0.2	...	...	...

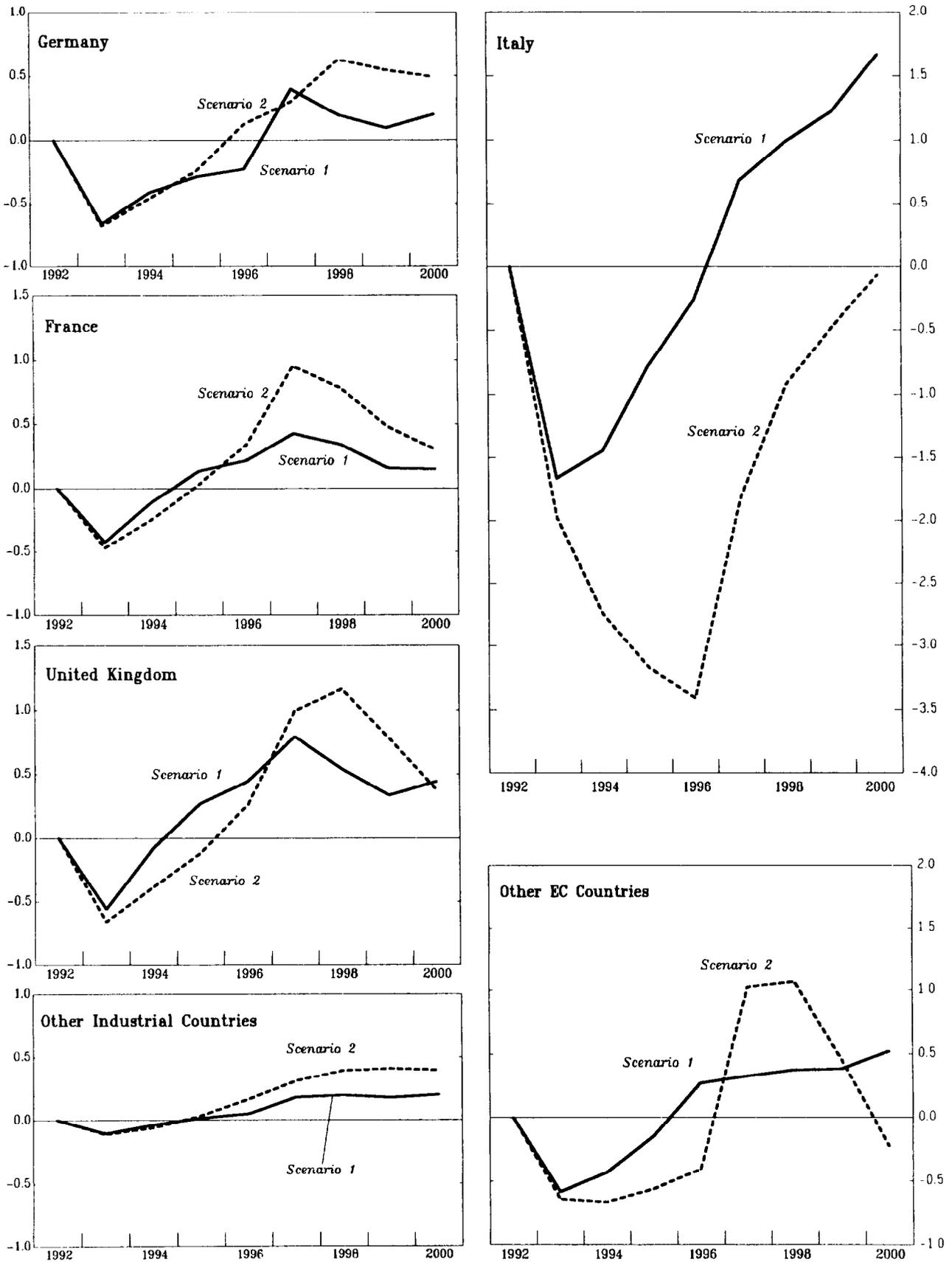
Chart 9. Real Effective Exchange Rates <sup>1</sup>  
(1987 = 1)



<sup>1</sup> Relative unit labor costs. Shaded areas are staff projections.



Chart 10. Deviation of GDP from Reference Scenario  
(Percent deviation)





With respect to the impact on the rest of the world, several offsetting influences are at work. There is a tendency for non-European currencies to appreciate. This in turn generates a decline in interest rates outside Europe, which compensates for the adverse impact on net exports to the EC. For the developing countries, there is a dampening impact on export prices (attributable to the appreciation of the U.S. dollar), which translates into slightly lower domestic inflation. The effect on output in developing countries of the implied terms of trade deterioration is offset by the effects of lower world interest rates.

Scenario 2 modifies the assumption in the reference scenario about the principal reason for the interest differentials between the nonconverging countries and Germany. It is now assumed that these differentials reflect a perceived loss of competitiveness in the past and the view that these gaps in competitiveness cannot be closed without parity changes. Hence there are strong market expectations of a final realignment before the fixing of exchange rates at the start of stage three. As a result, the process of fiscal convergence, although achieving the inflation and budget deficit criteria stipulated in the Maastricht agreement, does not lead to a narrowing of interest rate differentials. Some countries (Greece, Italy, Portugal, and Spain) might therefore not qualify for participation in stage 3.

In this scenario, the relatively small reduction of interest rates alleviates government debt-servicing costs much less than in scenario 1. The required degree of fiscal consolidation is therefore larger, and the adverse output effects of achieving the required degree of convergence of budget deficits are now more pronounced: the level of output is almost 3 percent lower relative to baseline in the case of Italy over the 1992-96 period (Table 11). This translates into an annual loss in output growth over the period of about 3/4 of 1 percentage point, although in subsequent years output growth would exceed baseline as the level of output returns to its baseline level. Again, however, the results must be qualified to the extent fiscal consolidation in any event would have been necessary. As a result of the adverse impact on output, inflation is sharply reduced. Because of the decline in nominal GDP, however, the debt-GDP ratios of countries with high debt burdens initially increase relative to the baseline; debt ratios would decline sufficiently only over the longer run as output eventually recovered. For countries that have already converged (such as France), the effects are only slightly negative because the reduction of Germany's inflation rate and budget deficit permits a reduction of interest rates. The impact on the rest of the world would be negligible because the depreciation of EMS currencies generates an easing of monetary conditions in other countries, which offsets the impact on trade flows.

The Accuracy of *World Economic Outlook* Projections  
for Industrial and Developing Countries 1/

The accuracy of the output growth (real GDP/GNP) and inflation (the GDP/GNP deflator) projections for the seven major industrial countries was examined in Annex VIII of the May, 1992 issue of the *World Economic Outlook*. This note extends that analysis to include the 14 smaller industrial countries; 2/ each of the groups of developing countries in Africa, Asia, the Middle East, and the Western Hemisphere; 3/ the average of these developing country groups; and 36 nonprogram developing countries (that is, those that were not engaged in Fund-supported stabilization and structural adjustment programs in 1988-91) for which data are available. The period covered by the analysis goes to 1991 and thus extends the sample beyond the 1971-85 period covered by Artis (1988) in his analysis of the forecasting accuracy of the *World Economic Outlook* projections. 4/

The *World Economic Outlook* projections are conditional on a number of assumptions about economic policies, exchange rates, and commodity prices. The relationship between these factors and deviations from projection outcomes are, however, beyond the scope of this study. For developing countries that are engaged in Fund-supported stabilization and structural adjustment programs, the projections assume that policies aimed at achieving the growth and inflation objectives are adopted and implemented.

The evaluation of the accuracy of the *World Economic Outlook* projections is based on the properties of the difference between the realization and the projection. 5/ A forecast is considered to be accurate if it is unbiased and efficient. A forecast is unbiased if its

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1/ Questions relating to this Annex may be addressed to Mr. Barrionuevo (ext. 34649).

2/ These countries are Australia, Austria, Belgium, Denmark, Finland, Greece, Ireland, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, and Switzerland.

3/ Eastern European countries and the states of the former U.S.S.R. are not included in the developing country group.

4/ M.J. Artis, "How Accurate is the *World Economic Outlook*? A Post Mortem on Short-Term Forecasting at the International Monetary Fund," in Staff Studies for the *World Economic Outlook* (Washington: International Monetary Fund, July 1988).

5/ The approach is developed in J.M. Barrionuevo, "A Simple Forecasting Accuracy Criterion Under Rational Expectations: Evidence from the *World Economic Outlook* and Time Series Models," IMF Working Paper 92/48 (June 1992).

average deviation from the outcome is zero. 1/ In theory, it is efficient if it reflects all the information that is available at the time the forecast is made, although practical statistical tests use only a limited amount of information. Of the two characteristics, unbiasedness is generally regarded as more important because it implies that the forecasts are, on average, equal to outturns.

In general, forecast efficiency implies that the deviation between the outcome and the projection is not related to information available at the time that the projections were made. In this annex, this condition is tested by measuring the statistical significance of the co-movement between the deviation of the outcome from the forecast and the forecast itself (called the  $\beta$ -test), and the co-movement between the deviation of the outcome from the forecast in the current period and that in the previous period (called the  $\rho$ -test). Although these tests do not exhaust all available information, if neither  $\beta$  nor  $\rho$  is statistically different from zero, then a forecast is said to be efficient. 2/ Finally, for comparison with Artis' results, the Theil inequality statistic is used to compare these projections with those of a naive forecast in the form of a random walk, in which the projection for the next period is the current period's realization. 3/ Of course, to the extent that growth and inflation tend to revert to a fixed mean, it should not be difficult to forecast with more accuracy than a random walk, which does not have this property.

The data are from the published versions of the *World Economic Outlook* and from earlier unpublished IMF documents. Two sets of projections are examined: the current-year forecasts prepared in the spring of the same year, and year-ahead forecasts made in the fall for the following year. For the current-year forecasts, the outcome is taken to be the figure reported in the *World Economic Outlook* published in the following spring; and for the year-ahead forecasts, the outcome is the estimate published two years later. The data start in 1971 for industrial countries, in 1977 for developing

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1/ A least-squares regression of the outcome minus the projection on a constant is used to test for unbiasedness; if the estimated constant is not statistically different from zero, the forecast is unbiased. K. Holden and D. A. Peel show that this is a necessary and sufficient condition for unbiasedness; see "On Testing for Unbiasedness and Efficiency of Forecasts," *The Manchester School of Economic and Social Studies*, Vol. 58 (June 1990), pp. 120-17.

2/  $\beta$  is estimated by a least-squares regression of the forecast error (that is, the difference between the outcome and the forecast) on a constant and the forecast, and  $\rho$  is estimated by a regression of the current-period forecast error on a constant and the previous-period error.

3/ The Theil inequality statistic is the ratio of the root mean squared error (RMSE) of the *World Economic Outlook* forecast to the RMSE of the random-walk forecast. If this ratio is less than unity, it indicates that the *World Economic Outlook* forecast is better, that is, it has a smaller average error than the random-walk forecast.

countries, and in 1988 for nonprogram developing countries. The smaller industrial countries and the developing countries include several countries for which projections are prepared only once a year. Therefore, for these countries the current-year and year-ahead forecasts may be very similar. Moreover, for some countries, the outcomes used in this annex, which are taken from the WEO, could be based on preliminary data.

#### 1. Industrial countries

Table 12 presents the results for each group of industrial countries. 1/ It shows that deviations between the outcomes and both the current-year and year-ahead forecasts of output growth and inflation were small and not significantly different from zero. Although both were unbiased, forecasts for the current year were, not surprisingly, more accurate than for the year ahead.

For all industrial countries, year-ahead forecasts of growth in 1971-91 overestimated actual growth by 0.4 percentage point on average, whereas the year-ahead forecasts of inflation underestimated actual inflation by 0.3 percentage point. Artis found that the average forecast errors for output and inflation for 1973-85 were 0.5 percentage point. This suggests that the bias in the *World Economic Outlook's* forecasts for industrial countries was reduced after 1985, probably because of the relative stability of output growth and inflation since 1985. In particular, there were enormous projection errors associated with the first oil price shock in 1973-74. The absolute average projection error for the group of 14 smaller industrial countries was higher than that for the major industrial countries, except for the average year-ahead growth projection, which was the same for both groups.

As well as being unbiased, the current-year and year-ahead forecasts of growth were efficient for the industrial countries. Current-year inflation forecasts were efficient (judged at a 5 percent level of statistical significance) for the seven large countries and for the small countries. 2/ Year-ahead inflation forecasts were efficient for the large countries but not for the small countries. 3/ The Theil statistics indicate that *World Economic Outlook* projections of growth and inflation for industrial countries were superior to random-walk forecasts, except for inflation projections for the smaller countries.

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1/ The outcomes for the seven major countries are taken from the May 1992 *World Economic Outlook*, Annex VIII, pp. 88-93.

2/ These forecasts fail the efficiency tests for all industrial countries as a group, with a statistic of 1.82 and a critical value of 1.80.

3/ For example, since  $\rho$  is significant in the case of the inflation forecasts of the group of industrial countries, the projection could be improved by adjusting for last period's error.

Table 12. Industrial Countries: Deviations of Outcomes  
from Projections 1/

(In percent)

	Output Growth			Inflation		
	Seven major countries	Fourteen smaller countries	All countries	Seven major countries	Fourteen smaller countries	All Countries
	<u>(Current-year forecast)</u>					
Average outcome	2.9	2.2	2.7	2.9	7.1	6.1
AFE <u>2/</u>	-0.1	-0.2	-0.1	--	0.5	0.1
RMSE <u>3/</u>	0.7	0.9	1.2	0.6	1.0	0.5
Theil <u>4/</u>	0.3	0.5	0.3	0.4	0.8	0.3
$\beta$ <u>5/</u>	--	0.1	--	--	-0.2	--
$\rho$ <u>6/</u>	0.1	0.3	0.2	0.3	-0.2	0.4*
	<u>(Year-ahead forecast)</u>					
Average outcome	2.9	2.4	2.9	6.0	7.1	6.1
AFE <u>2/</u>	-0.4	-0.4	-0.4	-0.2	0.8	0.3
RMSE <u>3/</u>	1.5	1.5	1.4	1.4	1.5	1.3
Theil <u>4/</u>	0.5	0.8	0.6	0.8	1.1	1.5
$\beta$ <u>5/</u>	--	-0.4	--	0.1	-0.3*	1.1
$\rho$ <u>6/</u>	0.1	0.2	0.1	0.3	0.3	0.4*

1/ The sample period is 1971-91 giving 21 observations, where except for the estimates of  $\rho$ , the sample size is 20.

2/ Average forecast error. The error is defined as the realization less the forecast; \* indicates that the projection error is significantly different from zero at the 5 percent level of significance.

3/ Root mean squared error.

4/ The Theil inequality statistic is defined as the ratio of the *World Economic Outlook* RMSE to the RMSE of the random-walk forecast, which is its last period's realization. A Theil inequality statistic less than unity implies that the *World Economic Outlook* projections are better than the random-walk forecasts.

5/ The symbol  $\beta$  is the estimated coefficient from a least squares regression of the forecast error on the forecast; \* indicates that the estimated coefficient is significantly different from zero at the 5 percent level of significance; that is, that the forecast is not efficient.

6/ The symbol  $\rho$  is the estimated coefficient from a least-squares estimation of the current-period forecast error on the forecast error of the previous period.

## 2. Developing countries

That the projections of output and inflation are conditional on economic policies is far more important for developing countries than for industrial countries, because many developing countries have adopted Fund-supported stabilization and structural adjustment programs. In these cases, the *World Economic Outlook* projections of growth and inflation assumed the full implementation of the policies stipulated in the programs. The deviations between the conditional projections and outcomes are therefore partly a measure of the extent to which the policies specified in the programs were not fully implemented, or partly a reflection of the fact that the assumptions about the global economic environment faced by these countries have not always been realized. Moreover, the economic situation of program countries has tended to be, on balance, worse than that of nonprogram countries, making forecasting more difficult for the former group.

Table 13 presents the results of the statistical tests for the four developing country groups as well as for 36 developing countries that were not engaged in Fund-supported programs. The tests performed for the nonprogram countries correspond more closely to those for industrial countries. The results show that in many cases there have been significant deviations between projections and outcomes for growth and inflation, both on average across all developing countries and for individual groups. In particular, actual growth fell short of the projections while inflation tended to exceed projected price increases. For the sample of nonprogram developing countries, both inflation and real output growth projections were unbiased in the 1988-91 period.

Table 14 reports the same tests for the subperiods 1977-85 and 1986-89. In the earlier period, real output growth fell short of the current-year projections by 1.1 percentage points for the average of all developing countries, whereas growth exceeded the current-year projections by 0.3 percentage point in the later subperiod for this group. For the year-ahead projections, output growth fell short of the projections in both subperiods, but the average shortfall declined from 1.4 percentage points to 0.5 percentage point. The RMSE 1/ also fell substantially between the subperiods: for the current-year forecasts, it fell from 1.5 percentage points to 0.5 percentage points; for the year-ahead forecasts, from 2.0 percentage points to 0.9 percentage point. In view of the important assumption of policy implementation, this reduction may suggest improvement in the record of meeting program objectives after 1985, perhaps because of the recent progress toward strengthened policies in many developing countries (see Chapter IV). In addition, the economic environment has been more stable in recent years than in the late 1970s and early 1980s. In

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1/ The RMSE is the square root of the average squared differences between the outcome and the projection, and therefore is not affected by cancellation of over- and underpredictions.

Table 13. Developing Countries: Deviations of Outcomes from Projections <sup>1/</sup>

(In percent)

	Output Growth						Inflation					
	Average	Africa	Asia	Middle East	Western Hemisphere	Nonprogram pooled	Average	Africa	Asia	Middle East	Western Hemisphere	Nonprogram Pooled
(Current year forecast)												
Average outcome	3.5	2.1	5.7	2.9	2.2	4.9	45.5	19.1	8.9	22.4	179.3	11.1
AFE	-0.5*	-1.0*	--	-0.3	-0.7	-0.2	11.1*	2.5*	1.7*	0.2	77.7*	--
RMSE	1.2	1.3	1.3	2.4	2.3	3.6	18.0	5.4	2.4	8.9	156.0	5.7
Theil	1.0	1.0	0.7	0.9	0.9	0.8	0.9	1.4	0.9	1.0	0.8	0.4
$\beta$	-0.3	--	-0.5	-0.3	-0.3	-0.6*	0.9*	-0.9*	0.1	-0.4*	1.7*	-0.2*
$\rho$	0.5	-0.1	--	-0.2	0.3	0.1	0.6*	-0.2	0.2	0.1	0.5*	--
(Year ahead forecast)												
Average outcome	3.7	2.3	6.1	3.1	2.3	4.7	46.9	18.8	9.2	22.6	200.2	13.7
AFE	-1.0*	-0.8*	0.2	-1.3	-1.7*	-0.6	21.7*	2.8*	2.6*	-1.1	141.8*	2.4
RMSE	1.6	1.4	1.7	2.5	2.9	4.2	30.3	5.8	3.7	16.3	237.0	7.1
Theil	1.2	1.1	0.9	1.3	1.1	0.9	1.1	1.1	1.4	1.7	1.1	0.7
$\beta$	-0.4	-0.7*	-1.5	-0.3	0.1	-0.7*	1.9	-0.9*	-0.8*	0.8*	5.9*	-0.4*
$\rho$	0.3	-0.1	0.3	0.4	0.4	--	0.5*	-0.1*	-0.1	0.3	0.5*	--

<sup>1/</sup> See notes to Table 12 for symbol definitions. The sample period is 1977-91, except for the year-ahead projections of inflation (1979-91) and for the nonprogram countries, for which pooled observations for 36 countries in 1988-91 (144 = 36x4 observations) are used. (Nonprogram countries are developing countries without arrangements with the IMF in 1988-91).

Table 14. Developing Countries: Deviations of Outcomes from Projections, by Subperiod <sup>1/</sup>

(In percent)

	Output					Inflation				
	Average	Africa	Asia	Middle East	Western Hemisphere	Average	Africa	Asia	Middle East	Western Hemisphere
Period: 1977-85 (Current-year forecast)										
Average outcome	3.5	2.3	5.4	4.2	2.5	33.6	19.7	8.2	27.5	81.5
AFE	-1.1*	-1.1*	-0.3	-0.7	-1.2*	4.1*	2.1	1.3*	-0.8	16.7*
RMSE	1.5	1.4	1.3	2.3	2.6	4.7	6.3	1.6	11.3	19.6
Theil	1.0	1.0	0.8	1.1	1.0	1.5	1.6	0.8	1.0	1.1
$\beta$	0.2	0.3	-0.9	0.1	-0.5	-0.2	-1.4*	-0.2	-0.5	-0.3*
$\rho$	0.2	-0.2	-0.2	--	-0.2	-0.2	-0.5	-0.5	0.5	0.8*
(Year-ahead forecast)										
Average outcome	3.8	2.5	6.0	4.1	2.6	34.1	19.6	8.4	29.6	89.7
AFE	-1.4*	-0.8*	-0.2	-1.7*	-1.8*	8.6*	2.5	2.0*	-3.6	40.0*
RMSE	2.0	1.5	1.7	2.9	3.3	8.4	3.3	2.4	19.5	41.4
Theil	1.2	1.0	0.9	1.8	1.1	4.5	0.6	1.3	1.8	2.6
$\beta$	0.1	-0.4	-1.4	-0.2	0.4	-1.0	-0.7*	-0.2	-1.0*	2.5*
$\rho$	0.2	--	0.4	0.6	0.5	-2.0*	-0.4	0.4	0.3	1.1
Period: 1986-91 (Current-year forecast)										
Average outcome	3.5	2.8	5.0	5.5	3.2	63.3	18.0	9.7	14.9	326.1
AFE	0.3	-0.8*	0.5	0.5	-0.1	21.5*	3.2	2.2*	1.6	169.2*
RMSE	0.5	1.0	1.2	2.5	1.7	27.7	3.8	3.3	3.6	245.6
Theil	0.7	0.8	0.9	1.2	1.2	0.9	1.8	0.7	0.6	1.3
$\beta$	-0.4	-0.1	-0.6	-1.6	1.8	0.9*	-2.0*	-0.2	0.1	--
$\rho$	-0.6	-0.4	-0.5	0.8	0.6	0.2	--	-1.4*	-0.2	-1.1*
(Year-ahead forecast)										
Average outcome	3.6	2.9	5.4	5.5	3.3	61.9	17.9	10.1	14.5	329.1
AFE	-0.5	-0.8	0.7	-0.9	-1.8	37.0*	3.2*	3.4*	1.9	260.5*
RMSE	0.9	1.3	1.3	1.9	2.4	46.8	7.6	4.7	3.3	345.3
Theil	0.9	1.0	0.9	1.7	1.2	1.1	0.7	1.3	1.0	2.3
$\beta$	-0.7	-1.0	0.7	-1.5*	2.0	2.3	-0.4	--	-1.2	-1.5*
$\rho$	0.4	--	--	1.3	1.0	0.1	-0.8	0.4	-0.5	0.8*

<sup>1/</sup> See notes to Table 12 for symbol definitions.

contrast, the average deviation between the outcome and the projection for inflation for the developing countries as a whole rose significantly between the periods. Although this result suggests a substantial departure from policy objectives, it must be interpreted with care, because the picture for inflation in 1986-91 was dominated by only a few countries.

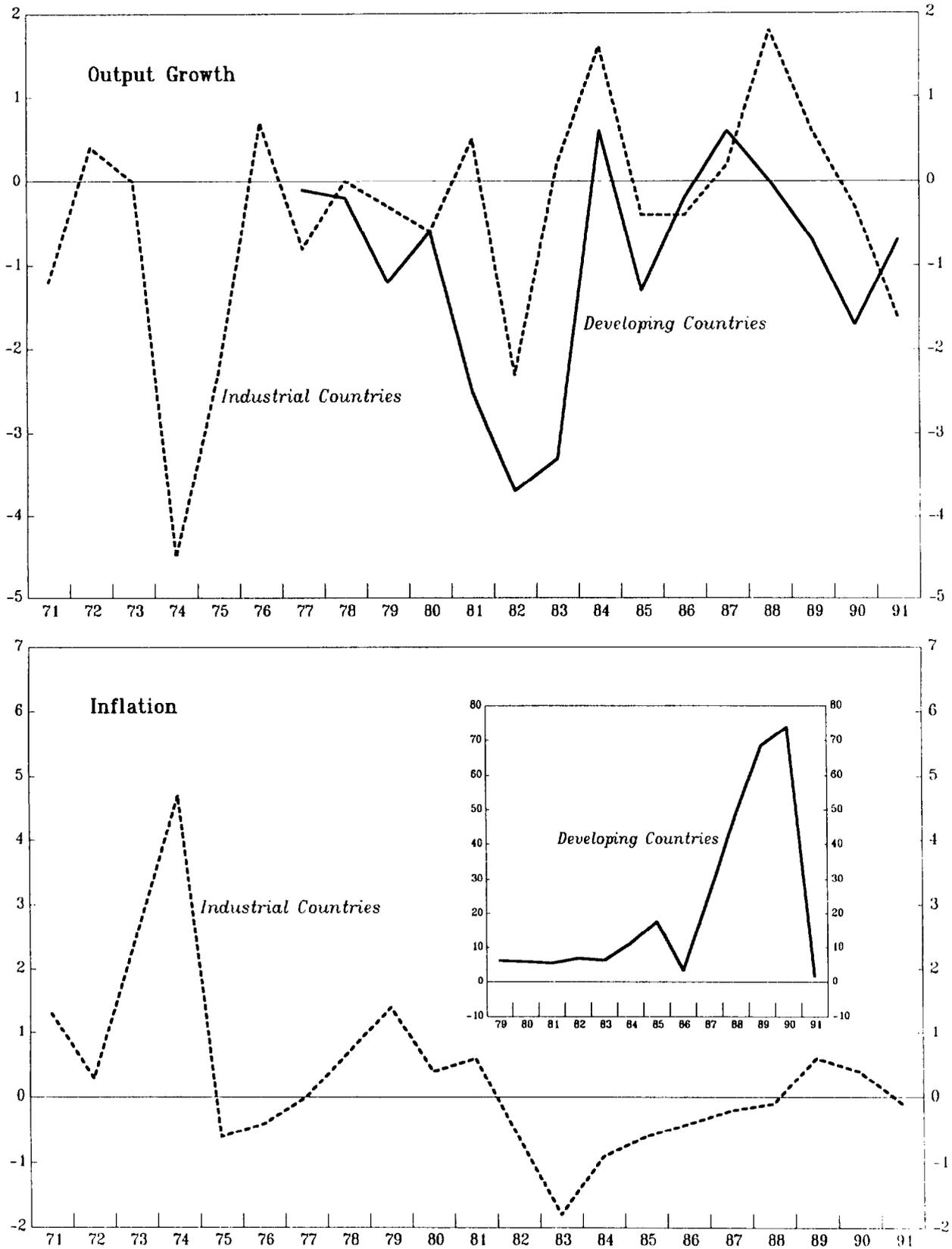
The growth projections for the full sample and for both subsamples were generally efficient for the developing countries. In contrast, neither the current-year nor year-ahead inflation projections satisfied the efficiency tests. According to the Theil statistics, random-walk forecasts were superior to the *World Economic Outlook* projections of both growth and inflation, although the statistics are somewhat lower for the 1986-91 period. However, the Theil statistics for the pooled sample of nonprogram countries are well below unity, implying that the projections for these countries were superior to random-walk forecasts. The difference in the Theil statistics between program and nonprogram countries may reflect unrealized policy objectives in the former.

Chart 11 shows the deviations between outcomes and projections for growth and inflation for the average of industrial countries and the average for developing countries. For output growth, the deviations tended to move in the same direction for both groups, although the magnitude was larger for the developing country group. Chart 1 also shows that the magnitude of the underprediction of inflation for developing countries increased significantly in the last four years of the 1980s, because of sharply increasing inflation in a few countries, notably Brazil and Argentina.

In summary, *World Economic Outlook* projections for the industrial countries have been largely unbiased and, with some exceptions, efficient. Projection accuracy improved after 1985, partly reflecting the more stable environment in the 1980s compared with the volatile 1970s. For developing countries there were significant deviations between outcomes and projections of growth before 1985, but they were small in the 1986-91 period. Although the economic environment has been more stable, the improvement in forecast accuracy suggests that policy assumptions have been more frequently met in recent years.



Chart 11. Difference Between Outcome and Forecast in the *World Economic Outlook* Projections<sup>1</sup>  
(In percent)



<sup>1</sup> Outcome minus year-ahead projection.

