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SUBJECT: Steel memo

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

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TEXT:

Do we need to do anything with the attached memo?

Nouriel

----- Forwarded by Nouriel Roubini/CEA/EOP on 12/30/98
09:51 AM -----

Malcolm R. Lee

12/30/98 07:04:42 AM

Record Type: Record

To: See the distribution list at the bottom of this message

cc: Karen Tramontano/WHO/EOP

Subject:

Sharon Yuan:

Here is the first cut of the Jan 5 steel report to Congress based on agency inputs and my initial revisions. It will need to be updated to reflect POTUS decisions, but should cover actions taken to date. Please circulate to all agency deputies for action, with comments back via e-mail and fax to me and to Gordana Earp at USTR no later than Friday noon. My e-mail is Malcolm_Lee@opd.eop.gov., and my fax is 202 456-9290. . Also fax to Lael at 456-2878

Message Sent

To:

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===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D1]MAIL44995436E.326 to ASCII,
The following is a HEX DUMP:

**REPORT TO THE CONGRESS
ON A COMPREHENSIVE PLAN FOR RESPONDING TO
THE INCREASE IN STEEL IMPORTS**

I. SUMMARY

This report responds to the request from Congress contained in the omnibus spending bill for the Administration's plan to address the rapid rise in steel imports into the United States.

The President, the Vice President, and the entire Administration are deeply concerned about the recent surge in low-priced steel imports and its impact on America's steel industry and the workers, families and communities that depend on it. There is no more important challenge than to ensure the strength of the U.S. economy and to minimize the impact of the global financial crisis on all Americans.

The situation has received sustained attention at the highest levels, including the President, Vice President, Secretary Rubin, Secretary Daley, Ambassador Barshefsky, Secretary Herman, White House Chiefs of Staff Bowles and Podesta, Council of Economic Advisor Chairperson Yellen, Office of Management and Budget Director Lew, National Security Advisor Berger and National Economic Advisor Sperling. The President, Vice President and several cabinet members have met with industry and union representatives on a number of occasions to discuss the industry's concerns and potential responses. We have held senior level inter-agency meetings almost weekly to shape an appropriate and timely response.

This Administration has responded forcefully with action on a number of fronts. We continue to monitor developments, and will take additional action as circumstances warrant. The actions outlined below are described in greater detail in the remainder of this report.

- **Restoring Global Growth:** The President is leading the world in efforts to restore global growth. Collapsing demand and declining currencies abroad have diminished U.S. exports and produced a rapid rise in certain low-priced imports including steel. Unless foreign economies recover, a strong U.S. economy will remain a magnet for excess global steel production, and our exports abroad will continue to suffer.
- ***Full Enforcement of Trade Laws:*** The Administration is fully, fairly, expeditiously and vigorously enforcing U.S. trade laws and taking action to eliminate any and all unfair practices. The Department of Commerce is currently enforcing more than 100 antidumping and countervailing duty orders on steel products from a number of countries. On November 23, Commerce issued a preliminary ruling of critical circumstances in the Japanese and Russian steel dumping investigations that will allow for the imposition of duties on imports of hot-rolled steel up to 90 days before the preliminary dumping determination. If dumping is found in February by the Department of Commerce, importers may be retroactively assessed dumping duties on imports reaching back to

mid-November. This could be having an impact right now on imports from Russia and Japan, because importers know they may face retroactive dumping duties on current imports. Further, Commerce has shifted resources to expedite the dumping cases on hot-rolled steel from Japan, Russia and Brazil.

- ***Russia:*** The dumping cases are proceeding consistent with legal requirements. The dumping laws also allow the United States Government to negotiate agreements limiting imports of products covered by pending dumping cases. In this context, the Commerce Department is exploring whether a possible suspension agreement could provide timely, effective relief from the surge of Russian steel imports consistent with statutory requirements. The Administration is committed to strong enforcement of our trade laws and the Department of Commerce will work closely with U.S. industry and union petitioners throughout this process.
- ***Pressing our Major Trading Partners:*** The President and the Administration are continuing to press our trading partners at every opportunity to end unfair trading practices and subsidization, and fairly share the burden of absorbing additional steel imports. When in Japan -- which accounts for half of the increase in steel imports -- the President warned of the danger of mounting protectionist pressures in response to unfair trade practices and underscored the need for fair, rules-based trade, full enforcement of trade commitments, greater market opening, and the need to avoid import penetrations not associated with market forces. In Korea, the President pressed President Kim to eliminate unfair trade practices and subsidization in Korea's steel sector. In December during the U.S.- EU Summit, the President pressed European Union President _____ to open its market to greater steel imports from distressed economies such as Russia.
- Japanese Government officials have since indicated that its steel producers report that shipments to the United States have dropped dramatically in the final months of 1998 (in hot rolled steel, from a September high of 317,000 metric tons to 60,000 tons in November to 5 to 7,000 tons in December) and will remain low in 1999. If accurate, this should begin to appear in our December import figures. Our steel dialogue with Korea has produced a Korean Government commitment to sell its second largest steel producer, now idled, through a transparent and open bidding process. The Korean Government has also committed to refrain from directed lending or provision of market-distorting subsidies to the entity once sold. The dialogue has expanded to include Korea's largest steel producer and a smaller producer. In November in Korea, President Kim told the President he wants to make progress on this issue. U.S. and Korean officials convene again in January.
- ***Tough Countervailing Duty Regulations:*** The Commerce Department issued tough new countervailing duty regulations on November 5 that will strengthen our ability to combat unfair subsidies. Commerce carefully considered the comments received from the steel industry and members of the Steel Caucus in preparing these regulations.

- **[WILL NEED TO INSERT ADDITIONAL ANY ADDITIONAL ACTIONS BASED ON POTUS DECISIONS]**

This Administration is committed to effectively addressing the legitimate concerns of steel workers and the steel industry. Free and fair rules-based trade is essential for both global economic recovery and U.S. prosperity.

II. ACTION PLAN

A. Enhanced Enforcement of Unfair Trade Laws (prepared by DOC)

This Administration is committed to aggressively enforcing U.S. trade laws to address any adverse impact unfairly traded steel imports may have on U.S. steel companies and American jobs. Commerce currently enforces over 100 antidumping and countervailing duty orders covering various steel products from several countries.

Expedited Investigations. At the end of September, U.S. domestic producers and unions filed petitions for antidumping and countervailing duty relief on imports of hot-rolled steel products from Japan, Russia, and Brazil. Prior to this filing, Commerce had shifted resources internally to ensure that our trade laws would be enforced as vigorously and as expeditiously as possible. Commerce initiated the cases five days ahead of the statutory deadline and has committed to expediting the preliminary decisions in those cases up to 20 days prior to the statutory deadline, while preserving the right of all parties to due process. This results in the issuance of the preliminary determination an unprecedented 25 days early.

Critical Circumstances. As the financial crisis expanded, a number of concerns were raised about the need to address, more quickly, import surges that may occur once a petition is filed or rumored to be filed. In response to these concerns, Commerce issued a policy bulletin on critical circumstances, the legal mechanism for addressing such import surges. The bulletin explained Commerce's policy in this area and made clear that, under the statute and regulations, a preliminary critical circumstances determination could be made prior to the preliminary dumping determination, as long as all of the statutory criteria were met.

On November 23, Commerce issued a preliminary finding of critical circumstances with respect to Russia and Japan. This was the first instance where Commerce applied its new policy, affecting all ongoing and future cases. This finding makes clear that, if Commerce finds dumping in its February 12 preliminary determinations, importers will potentially be liable for duties back to November 14, which is 90 days before the preliminary determination of dumping.

New Stronger Regulations. Over the past year, Commerce has been working on several sets of regulations that reflect our strong commitment to offsetting unfair trade practices. In November, Commerce released final countervailing duty regulations that will guide its analysis

and calculation of foreign subsidies. In preparing these regulations, Commerce considered carefully the comments we had received, including those of the steel industry and Members of Congress. The final regulations are designed to enhance strong enforcement of the trade laws, and send an important signal to our trading partners that we will not tolerate the subsidization of imports that harm our industries and workers. **[What about prior subsidies to privatized firms??]** For example, one area where the subsidy rules were strengthened concerned the government's provision of equity to an unhealthy company. Consistent with many of the comments received, a final rule was adopted that treats the entire amount of the equity infusion as a grant. Likewise, the rules regarding government loans to uncreditworthy companies have been strengthened to better account for the increased risk associated with lending to such companies. In addition, in response to concerns that the transnational subsidies rule, which exempts international development assistance from countervailability, would allow recipient countries to use IMF funds to subsidize their industries with complete immunity from the U.S. countervailing duty law, we have made clear that foreign governments cannot try to exempt ordinary subsidy programs by claiming a link to international funds.

Commerce also recently released regulations and a policy bulletin concerning sunset reviews. These reviews, which are required to be conducted every five years under U.S. law and the WTO, determine whether an antidumping or countervailing duty order is still needed to address dumping or unfair subsidies and injury. Commerce has set out tough, but fair, rules regarding sunset reviews to ensure that orders that are necessary to remedy unfair trade practices are not revoked. Steel industry and union representatives recently proposed a number of additional changes, which we are reviewing.

Eliminating Subsidies and Directed Lending. Many foreign governments continue to view steel production and self-sufficiency in steel as prerequisites for industrialization. Foreign steel industries, therefore, have often been supported through government subsidies to encourage expansion or to forestall restructuring and lay-offs. Global overcapacity remains serious problem in the industry. Through bilateral efforts, multilateral fora such as the OECD Steel Committee and the WTO, and through strict enforcement of our countervailing duty laws, the Administration is taking forceful action to eliminate improper government involvement in the important sectors such as steel.

When the financial crisis began to spread in 1997, a number of U.S. industries, particularly the steel and semiconductor industries, expressed concern that foreign governments would resort to subsidies in an attempt to export their way out of the crisis. Commerce's Subsidies Enforcement Office responded by expanding its activities and working closely with USTR to evaluate industry concerns about possible new subsidies abroad. As a result of these activities, the Administration has actively engaged a number of countries to address subsidy concerns. Our considerable bilateral efforts with respect to the subsidies in the Korean steel industry are described in the next section of this report.

Commerce, USTR and Treasury have taken numerous steps to address the problem of directed lending, particularly as it applies to the Korean steel and semiconductor industries. All

three agencies have been carefully monitoring the issue, and have paid close attention to industry and bank restructuring programs. The issue has been raised on numerous occasions with the Korean government and Korean industries, by the President and the Secretaries of State, Treasury, Commerce and the United States Trade Representative. Directed lending to the steel industry is also being examined by Commerce in two ongoing Korean countervailing duty investigations, along with several other alleged subsidy practices. The cases are currently scheduled to be completed in March and April 1999.

Commerce and USTR are responsible for WTO subsidy enforcement activities and have worked together to identify possible violations of the WTO or U.S. trade law and help U.S. producers combat unfair competition in U.S. and foreign markets. Commerce's Subsidies Enforcement Office has counseled a wide variety of industries concerned about foreign subsidies, including the steel industry. USTR and Commerce have worked on several prominent WTO cases involving subsidies, such as the Indonesian autos case. That case recently resulted in a favorable panel decision and the elimination of subsidies to the Indonesian auto industry that undercut the ability of U.S. auto producers to enter the Indonesian market.

In addition, the Clinton Administration is monitoring the subsidy and trade-related commitments made by IMF fund recipients as part of their IMF stabilization packages. These packages contain a number of positive conditions, including the removal of government-directed financing, export subsidies and special tax exemptions. If properly implemented, these conditions would eliminate a wide range of practices that may confer unfair subsidies, including many which Commerce has found actionable in past subsidy cases. The Administration is monitoring the market-opening commitments of the stabilization packages, as well. These commitments include tariff reductions, removal of certain import restrictions, changes in public procurement practices and liberalization of the financial services markets, all of which should improve access to these markets for U.S. exporters.

B. Bilateral Initiatives to Eliminate Unfair Trade Practices and Ensure Open Markets, Equitable Burden Sharing (USTR w/ DOC on Russia)

At the outset of the steel import crisis, the Administration engaged steel exporting and importing countries in consultations aimed at ensuring fair trade and sharing of the import burden. This is a top-level concern for our Administration. The President personally expressed his deep concern, both in public and in private meetings, including in his recent visits to Japan and South Korea and in recent meetings with European leaders. The Vice President expressed strong concern about the surge in imports from Russia during his recent meeting at the APEC meeting in Kuala Lumpur with Prime Minister Primakov and strongly urged the EU to open their markets and absorb their fair share of imports in his speech to the TransAtlantic Business Dialogue. Ambassador Barshefsky has done so as well in meetings with European and Asian officials, as has Secretary Daley. We are urging our trading partners to respect established international rules and to trade fairly, including refraining from subsidization and dumping. Dialogue is underway with three countries, Japan, Russia and Korea, which account for almost

eighty percent of our steel import growth, and we have also pressed the European Union to share the burden of increased steel exports, particularly with respect to Russia and Japan, two countries which account for the bulk of the existing excess steel supply.

[USTR, need to use uniform volume measurement - let's use metric tons or net tons throughout, whichever we use in our official statistics. Please work with Commerce]

Japan. A weak Japanese economy continues to be one of the largest impediments to economic recovery in Asia, and a significant cause of the surge in low-priced imports into the United States. Japan, which until 1998 had been the world's largest steel producer, has experienced a sharp decline in domestic and regional demand for steel as well as finished products that contain steel. A large portion of Japan and Asia's excess steel has flooded the U.S. market. Japan moved from being the third largest supplier of steel imports into the U.S. market in 1997, to being the largest source of U.S. steel imports, and was responsible for 43 percent of the increase in U.S. steel imports in the first ten months of 1998. U.S. imports of steel products from Japan in the first ten months of 1998 were 5.5 million net tons, up 3.3 million net tons out of the total import growth of 7.9 million during that period. Thus Japan has played a major role in the steel import surge which has had an adverse effect on U.S. steel producers. In addition, exports to Japan by American steel-using industries, U.S. steel producers' customers, fell off sharply, causing an additional adverse effect on U.S. steel producers by reducing demand for their product. U.S. exports to Japan through October 1998 in two key steel-using sectors, vehicles and machinery, declined \$2.2 billion over the same period in 1997, accounting for 36 percent of the \$6.1 billion decline in overall U.S. exports to Japan during the same period.

Pressing Japan to take the necessary steps to achieve economic recovery has been a key element of the Administration's economic and trade policy. Specifically, the Administration has urged Japan, in the strongest terms, to stimulate its economy, reform its banking sector, and deregulate and open its market to international competition. Swift and effective implementation of these policies in Japan would be the single most effective way to restore growth and demand in Asia, thereby reducing steel import pressures on U.S. producers and workers and stimulating exports of U.S. goods and services..

During his November visit to Japan, in addition to pressing the Japanese Government to take the steps necessary to stimulate domestic demand led growth, strengthen its financial system and open and deregulate its markets, the President expressed serious concerns about the significant increase in Japanese steel imports exports to the United States, both in his public statements and in his private meeting with Prime Minister Obuchi. Citing a 500 percent increase in U.S. imports of Japanese hot rolled sheet, the President underscored the need for fair, rules-based trade and greater market opening, as well as the need to "avoid market penetrations that have no relationship to market forces." Ambassador Barshefsky has made it clear that Japan cannot expect to export its way out of its recession; rather, it must take decisive and immediate steps to revive its economy and consequently its domestic demand for steel.

In response, the Japanese Government sought to assure the Administration that Japan's overall steel exports to the United States would decline somewhat at the end of 1998. This expectation was based on a combination of economic stimulus programs, and steps by Japanese steel producers to reduce production to account for reduced demand in Japan, Asia, and the United States. Japan's Ministry of Finance export statistics reflect exports to the United States of 458,000 metric tons for the month of November. While this is a 32.8 percent decline from Japan's average exports of 681,000 metric tons in the months of March through October 1998, it is still double the average monthly export rate in 1997.

While U.S. imports from Japan have surged in a number of steel products, 52 percent, or 1.3 million metric tons, of the import growth has been in hot rolled sheet products. A reduction in Japanese exports of this product is possible. Japanese officials estimate that Japan's hot rolled sheet exports to the United States were about 60,000 metric tons in November, as compared to 317,000 tons in October. The critical circumstances finding issued by the Department of Commerce in its dumping investigation, if confirmed by an ITC injury finding, will also ensure that any dumping margin found will be applied to all imports entered beginning ninety days before the preliminary dumping determination, expected in mid-February.

[USTR: Pls clear with Justice] The Administration remains concerned about persistent reports of collusive private activities in international steel trade that may have the effect of artificially diverting Japanese steel exports from European to U.S. markets. The Administration has pressed these concerns with the appropriate EU and Japanese officials to ensure that any such activities are dealt with vigorously and effectively. The Administration has pressed Japan to strengthen and strictly enforce laws and policies to combat anticompetitive practices. Work on this issue has proceeded actively through the "Deregulation and Competition Policy Working Group" of the "Enhanced Initiative on Deregulation and Competition Policy," which was established in June 1997 by President Clinton and Japan's then-Prime Minister Hashimoto.

Korea. The United States has pursued an intensive dialogue with Korea aimed at ensuring that the Korean steel sector operates on a market-driven basis. This dialogue has been comprehensive, sustained, and conducted at all levels of government. On November 21, President Clinton stressed to Korean President Kim Dae Jung the need for further progress in our expanded steel dialogue and emphasized that special care should be taken to avoid unfair trade practices or subsidization in sensitive sectors such as steel.

Upon receipt of a complaint from U.S. steel producers, alleging that Hanbo Iron and Steel (Hanbo), a Korean mini-mill which is now in bankruptcy, had been provided government subsidies, Ambassador Barshefsky and Secretary Daley engaged the Government of the Republic of Korea (ROKG) in substantive and detailed consultations on this issue. Through these consultations, the Administration obtained written assurances from the ROKG that it will not support or direct others to support Hanbo. Hanbo has now temporarily shut down production of hot-rolled sheet. We also have received assurances that the Hanbo creditors and the independent agent managing the sale of Hanbo will take all steps necessary to effectuate a market-driven sale.

We continue to monitor these assurances. While retaining all our options, we believe that these ROKG undertakings constitute the most timely, direct and commercially meaningful means to address our industry's concerns about Hanbo.

The Administration also expanded the steel dialogue to encompass broader concerns about the Korean steel industry -- in particular, regarding two other Korean steel producers: Pohang Iron and Steel Company (POSCO), the world's second largest steel producer, and Dongkuk, a large producer of cut plate exports to the United States. With respect to POSCO, our goal is to ensure that the company is fully, expeditiously, and permanently set on a market footing. Effective privatization of POSCO would ensure that its pricing, production and other business decisions are made at arm's length from the ROKG, thereby addressing industry concerns about POSCO's operations.

In response to the ROKG's announcement of its plans to privatize POSCO, and U.S. industry's interest in seeing the ROKG's ties with POSCO severed, USTR officials initiated detailed bilateral discussions about Korea's plans in this regard, and strongly urged the ROKG to expeditiously complete this process. On December 9, 1998, the ROKG sold 5.1 percent of its 33 percent stake in POSCO through a stock offering on the New York and London exchanges, and further steps are anticipated shortly. The Administration is also seeking to ensure that other Korean steel producers, including Dongkuk, a large exporter of cut plate to the United States, are not benefitting from ROKG support. Additionally, the Administration has emphasized that Korean steel exports to the United States from companies such as Dongkuk, which are supplied with inputs from POSCO, must be traded fairly and must not be afforded an unfair advantage over U.S. companies through market-distorting subsidies. Over the coming months, the Administration will continue the dialogue with the ROKG with a view to addressing concerns U.S. steel producers and workers have raised with possible unfair trade practices. The next round of bilateral discussion is scheduled for January.

Separately, on November 17, 1998, the Commerce Department made a preliminary finding in a CVD investigation on POSCO's stainless coil that the company's practice of charging different prices for the coil based upon the purchaser's anticipated export performance meets the definition of an export subsidy under U.S. law and, therefore, is countervailable. The final ruling on this issue currently is scheduled for early March 1999.

At 2.9 million net tons through October 1998, U.S. imports from Korea grew by 1.5 million net tons over the same period in 1997, accounting for 19 percent of the U.S. steel import growth in that period. U.S. steel imports from Korea during that period doubled, and imports in a number of individual product categories increased even more sharply. While trade remedy tools are available under U.S. law to address injurious import surges, the Administration efforts to reduce Korean government involvement in the steel sector are designed to reduce trade distortions in the longer-term.

Russia. The dumping case is proceeding consistent with legal requirements. The dumping laws also allow the United States Government to negotiate agreements limiting imports of products covered by pending dumping cases. In this context, Commerce is exploring whether a possible suspension agreement could provide timely, effective relief from the surge of Russian steel imports consistent with statutory requirements. Commerce is committed to the strong enforcement of the U.S. trade laws and is working closely with U.S. industry and unions throughout this process.

At the same time, we are continuing efforts to stabilize the Russian economy, promote market based reforms, and restore growth, all of which should over the longer term reduce excess capacity in sectors such as steel and stimulate domestic demand. **[TREASURY: NEED A FEW LINES HERE]**

EU. U.S. steel producers have expressed the concern that the European Union (EU) quotas on steel imports from several former Soviet Republics, and Russia in particular, may be causing a diversion of Russian steel exports into the United States. They also expressed the concern that the EU is not bearing an equitable burden of the Asian steel export surge and, in particular, that the EU's imports from Japan are only a fraction of ours. U.S. industry representatives have alleged that a primary reason for the low rate of Japanese exports to the EU may be the existence of anticompetitive understandings between European and Japanese producers. **[USTR: JUSTICE (Klein) NEEDS TO CLEAR THIS]**

The Administration has taken these allegations very seriously. We have undertaken a detailed comparison of U.S. and EU steel trade data, and U.S. government officials have discussed this issue at various levels with officials of the European Commission, the EU Presidency and with member states. Similar to the United States, the EU experienced a substantial increase of steel imports pursuant to the Asian crisis, as well as a drop in steel exports. Through August of 1998 (the most recent import data available in the EU), U.S. and EU imports grew by an equivalent amount, about 4.7 million metric tons each. The EU has traditionally been a net steel exporter, and its imports grew from a lower base, and thus the growth has been higher in percentage terms (53 percent compared to 24 percent in the United States). At 24 million metric tons through August 1998, U.S. steel imports were about double the EU imports of 13 million tons.

However, due to import quotas and licensing requirements on imports from Russia, EU imports from that country through August 1998 remained flat from the year before, at 1.1 million metric tons. This compares to U.S. imports from Russia of 2.9 million metric tons in the same period. EU imports from Japan were .35 million metric tons, compared to U.S. imports of 3.5 million. Due to substantially reduced domestic demand, Russia and Japan have substantial quantities of excess steel and have accounted for a substantial share of increased imports in the United States and other non-EU markets. Thus, we believe that these countries' exports to the EU would also have grown substantially were it not for import restraints. We have therefore urged the European Commission to review its import licensing and quota

arrangements with Russia and other former Soviet republics, with a view to accommodating additional tonnage. We understand that the government of Russia is seeking quota increases. In addition, we have pressed the EU to examine the reasons for the low levels of imports from Japan.

The Administration pressed the European Union to bear its share of absorbing the excess supply of steel in the world market on various occasions. President Clinton raised the issue during the U.S.-EU Summit in Washington on December 18. In her recent visit to Brussels, Germany, France and Britain, Ambassador Barshefsky underscored that the EU's steel imports from Russia are less than half the volume of U.S. imports from Russia, and its steel imports from Japan are only a tenth of Japan's shipments to the United States, and asked that barriers to imports be reviewed.

As noted above, the Administration remains concerned about possible collusive private activities in international steel trade that may have the effect of artificially diverting Japanese steel exports from European to U.S. markets. We have pressed these concerns with the appropriate EU officials to ensure that any such activities are dealt with vigorously and effectively.

C. Import Monitoring

Enhanced Import Monitoring. In anticipation of potential trade problems arising out of the global financial crisis, early this year, Commerce put in place an extensive import monitoring program that closely tracks imports and prices in key import-sensitive sectors, such as steel, semiconductors, autos, paper, textiles and chemicals. This program was designed to provide an early warning system that the Administration could use to formulate a swift response to potential import surges. With respect to steel, the monitoring efforts have been enhanced by obtaining preliminary Census data on steel imports 20 days prior to the official release date. The data that has been collected has been extremely useful in helping the Administration evaluate trends in import volumes and prices for key industries such as steel.

With respect to steel, the import monitoring program has provided the Administration with a quick and common source of steel import data. This information is discussed regularly in interagency meetings and has been used in discussions with our trading partners. During the President's recent trip to Asia, the data was used by Secretary Daley and the President to press Prime Minister Obuchi of Japan and President Kim Dae-Jung of Korea to do their part to address any and all unfair trade practices. It was also used in discussions with the EU about taking their share of the burden from the financial crisis during December's U.S.-EU Summit.

Import Licensing. The industry has been interested in the establishment of an import licensing system for steel as a means of obtaining public information on steel imports more quickly. Such a system would allow them access to early steel import data that they are currently prohibited from obtaining due to restrictions on the early release of Census data. The

steel industry argues that such programs, if properly applied, are permissible under the WTO, and that Canada, Mexico and the EU have steel import licensing regimes.

The Administration is examining the merits and feasibility of implementing an import licensing system on steel. In addition, any such import licensing system would have to be structured in a manner consistent with the relevant WTO Agreements. *[This section may need to be revised based on decisions by Principals and POTUS.]*

- D. Restoring Global Demand and Ensuring Market-Based Reform: Economic Stabilization Measures (Treasury w/ DOC and USTR to provide Eliminating subsidies (moved) and Russia(eliminated as drafted))

[Treasury: This section is absolutely critical, but reads as an abstraction. Please shorten dramatically and tailor to the readers of this report, revising in context of preceding sections of this report].

The Asian Financial Crisis and its Impact. After years of strong economic growth in Asia, the financial crisis which developed in Asia during 1997 has directly impacted Korea, Indonesia, the Philippines, Malaysia and Thailand, and indirectly affected the other economies in the region. More recently, difficulties in Japan and Russia have compounded the global impact of the Asian crisis, affecting financial markets, capital flows, and international trade.

The Asian crisis was precipitated by a variety of factors, some common to all the nations affected. The depth and severity of the crisis was due in part to weak financial systems in the crisis countries, weaknesses that were exacerbated by close links between governments, banks, and corporations that led to fundamentally unsound investments. Financial regulation and supervision were inadequate, and financial systems lacked transparency and did not have appropriate mechanisms to analyze and manage risk. Some of the Asian economies also suffered from an unsustainable combination of large current account deficits, fixed exchange rates, and inconsistent monetary policies. Significant amounts of capital flowed into unproductive areas of these economies during the 1990s from foreign investors who failed to adequately assess the risks involved.

Falling export growth and the failure of financial institutions in Thailand sparked the crisis, eventually forcing the government to abandon its currency peg in mid-1997. The devaluation of the Thai currency put pressure on other currencies in the region as the depth of the region's problems were gradually revealed. As the crisis began to unfold, banks and foreign investors withdrew capital, local companies sought to hedge hard currency exposures; exporters ceased converting their earnings into domestic currency, and citizens shifted their savings to hard currencies. Thailand, Indonesia, Korea, Malaysia and the Philippines all experienced sharp declines in currency values. Stock and land prices fell steeply, Asian banks and companies faced severe financial constraints, and affected economies suffered from recessions and sharp reversals of current account positions.

While growth slowed in Taiwan, and a mild recession is occurring in the Philippines and Singapore, severe recessions have developed in Indonesia, Malaysia, Korea, Thailand, and Hong Kong. A recession in Japan, which reduces the demand for exports from Southeast Asia, has slowed recovery in the region. Japanese imports from the region could fall by as much as \$10 billion in 1998, diverting these normal Asian exports to other countries. Traditional export sales to Asian markets have also been affected by the crisis, and exporters are competing for new destinations for these goods, with consequent effects on global prices.

The strength of the U.S. economy, combined with weakness abroad, has sustained U.S. import growth while decreasing the demand for U.S. exports. In the affected Asian economies, our exports have fallen by 35-50% since 1997, while U.S. imports have increased only moderately.

The U.S. steel industry has experienced the direct effect of lower priced imports. In addition, our economy has been hit by the indirect effect of price pressures from an oversupply of steel exacerbated by falling demand in Asia and Russia. Without the international efforts to stabilize the currencies of countries affected by the crisis, it is likely that currencies would have fallen further, and the effects on our trade flows would have been even larger than we have currently seen.

[Treasury: following paragraph added to try to bring more focus to this section]
{Nevertheless, the impact on the U.S. steel industry has been significant. Imports of all steel mill products for the first ten months of this year are at record levels, up roughly 28 percent over the same period last year. For the first ten months of 1998, imports of steel mill products from Russia increased 47 percent over the same period last year, while imports of all steel mill products from Japan increased 162 percent. Import penetration for all steel products (for which we do not yet have November projections) has risen to 29.5 percent for the year through October as compared to 24.2 percent for the same period last year. With respect to hot-rolled sheet, the product comprising the bulk of steel trade, total imports for the first ten months of this year are up 65 percent over the same period last year, with import penetration rising to 36.2 percent for the year through October as compared to 24.4 percent for the same period last year. Imports of hot-rolled sheet from Russia are up 71 percent over the first 10 months, imports from Japan are up 399 percent, while imports from Korea fell roughly 1 percent over that same period. Capacity utilization for hot rolled sheet and strip has fallen from 93.2 percent in the first quarter of 1998 to 78 percent in the fourth quarter through December 5. Total steel employment has fallen to 226,300, a loss of 10,000 jobs over the last year.

Stabilizing the Global Financial and Trading System. The Administration has worked within the international community to develop a coordinated response to the Asian financial crisis, focusing on the following areas:

(1) Strong reform programs within the affected countries. The approach of the international community to the Asian financial crisis emphasized programs designed in

conjunction with the IMF, World Bank, and Asian Development Bank that require nations to take concrete steps to reform their economies. New programs were initiated for Korea, Thailand and Indonesia, and the existing program for the Philippines was strengthened. The goal of these reforms was to restore financial stability, promote stronger and more stable exchange rates, attract new capital, address underlying structural weakness, and restore economic growth. The IMF programs were designed to address the specific issues facing each nation, and were based on strengthening financial systems, opening markets to both capital and trade, strengthening the social safety net, and following appropriate monetary and fiscal policies. In Korea and Indonesia, the programs have also included strong structural reforms designed to increase competition, enhance transparency and disclosure, and improve governance in the public and private sectors. In addition, each country has worked towards putting in place a framework for the restructuring of large debt loads and improving oversight and regulation of the banking system. **Russia?**

Specific reforms in Indonesia and Korea highlight the kinds of changes underway. In the case of Indonesia, government-run projects, intended as industrial policy and aimed at excluding imports, have ended or will end soon, including the National Car Program and the National Aerospace Project. Despite the sharp economic downturn in Indonesia, the Indonesian government has undertaken structural reforms to reduce tariffs on agricultural commodities and industrial goods, eliminate export taxes, and disband marketing monopolies.

The Korean government commitment to increased openness to imports and foreign investment has led to substantial changes in import restrictions. Equity, bond, and money markets have been substantially liberalized. The government has also enacted legislation to abolish restrictions on foreign ownership of land and real estate properties. Continuing reforms in corporate governance, accounting, and the financial sector should lead to greater transparency and openness in corporate decision making and lending practices. The Korean government has also agreed to end its involvement in directing lending decisions by Korean commercial banks.

(2) International financial assistance. These countries have been supported by \$64 billion in temporary financial assistance from the International Monetary Fund and other international financial institutions to bolster reserves, to provide breathing room for the reforms to take hold, to help restore confidence, and to prevent a deeper, more prolonged crisis. There are careful constraints on how these resources are used. **[Anything relevant to the steel industry on these constraints???**

(3) Bilateral trade finance. As the financial crisis hit Asia, traditional sources of trade finance dried up. The lack of trade finance threatened U.S. exporters with sales in Asia. It also threatened the successful reform of Asian countries and their return to growth and stability. The United States Export-Import Bank responded by remaining open for short-, medium- and long-term business in Asian markets and by establishing special short-term trade finance programs in Korea, Thailand, and Indonesia of \$2 billion, \$1 billion and \$1 billion, respectively.

U.S. Ex-Im Bank has also increased its medium-term trade finance program for Korea to \$3 billion, and announced medium-term programs for Indonesia and Thailand of \$1 billion each.

In addition to the activities of Ex-Im Bank, the United States mobilized a multilateral effort to restore trade financing to Asia, in which G7 and OECD export credit agencies pledged to remain open for business in Asia.

(4) Encouraging growth in Japan. The United States has been urging Japan to provide adequate and sustained fiscal stimulus to restore domestic demand-led growth. We have stressed the need for Japan to continue to take action to strengthen its banking system and to use public funds effectively, with appropriate conditions, including stronger disclosure and steps to clean up the banks' balance sheets and permanently dispose of bad assets. We have advocated that Japan continue to deregulate and take market-opening measures and that progress would help to make Japan's economy more efficient and competitive.

Japan faces its most prolonged post-war recession, severe banking system strains, and deflationary pressures, the result of contractionary domestic policies which were magnified when the Asian crisis sharply reduced demand for Japan's exports. Addressing deficit reduction in anticipation of higher future social security and health care costs related to Japan's aging population, the Government of Japan began a substantial fiscal contraction in 1997. The policy dried up domestic demand, particularly private consumption. Banking system concerns, initially prompted by some major financial institution failures, weighed further on the economy.

The Government of Japan has reversed its fiscal stance and its spending, but net stimulus in packages announced to date is not likely to bring the economy to positive growth in CY1999. The Bank of Japan is actively pursuing an easy money policy in order to address weak domestic demand, the drag of bad assets in banks' loan portfolios, and credit crunch concerns. Japan's recent actions in the financial sector B providing public funds for bank restructuring and nationalizing weak banks, among other measures B demonstrate that it is beginning to come to grips with the size and gravity of its banking system problems. However, lack of reform conditionality dilutes the effectiveness of Japan's actions in achieving needed financial sector restructuring.

The weakness in Japan's domestic demand and financial sector is slowing Asian recovery. Japanese imports from Asia have fallen considerably since last year, Japanese banks have reduced lending and Japanese firms have shrunk direct investment in the region. Conversely, Japan's recovery is impeded by the substantial drop in Japanese exports to Asia and the Asian financial crisis has exacerbated Japan's domestic banking problems.

(5) Support for open markets. The United States has been a strong advocate of open markets and continued international efforts to liberalize trade. We have encouraged Europe, Japan and other countries to do their fair share in permitting access to their markets for crisis countries. Central to our policy of ensuring that other countries uphold their international commitments is the vigorous enforcement of our trade laws. When industries have identified complaints of barriers to market access or injury caused through WTO-illegal dumping or subsidization, the Administration is willing and able to act.

Since September 1998, the United States has worked with other G-7 industrial nations to put in place additional measures designed to enhance the global community's ability to respond to future financial crises:

- Recognizing that inflation is low or falling in most parts of the world, the U.S. has been working with our G-7 partners to focus on the need to promote sustainable global growth. The recent decision by the Central Banks in the U.S., Japan, Canada, the UK, Italy and several other European countries will help maintain strong growth in our economies without jeopardizing our continuing commitment to low inflation.
- The U.S. has focused on reinforcing the capacity of the international community to provide financing to countries pursuing sound policies which are affected by contagion. Final agreement on the IMF Quota increase and the New Arrangements to Borrow will provide an additional \$90 billion of resources to the IMF. With U.S. encouragement, the G-7 industrial countries have agreed to support a new IMF mechanism of contingent finance to countries pursuing strong policies, to be complemented as appropriate by bilateral contingent financing. Recent policy reform commitments by the Government of Brazil will help ensure confidence in the fundamental strength of the Brazilian economy and help to stem contagion to Latin America.
- The Administration has encouraged measures to accelerate corporate debt restructuring in countries where there is a systematic problem. We have also been working closely with Japan, the World Bank, and the Asian Development Bank (ADB) on a multilateral initiative to revitalize private sector growth in Asia. The World Bank and the ADB have responded positively to our challenge to increase the assistance they provide to protect the most vulnerable in society from bearing the most severe pain of adjustment. We hope that a new World Bank emergency facility will provide vital support for the most vulnerable groups and support for financial sector restructuring.
- We are working to find better preventive measures to reduce the frequency and severity of global financial challenges and to strengthen the international financial architecture. Our goal is a strong market-based financial architecture which induces sound decision-making by investors, encourages capital to be used productively, and rewards governments that pursue sound policies. To this end, the G-22 countries are focusing on increased openness in the international financial system; strengthened national financial systems, particularly in emerging market economies; promotion in industrial nations of more soundly based capital flows; and developing new ways to respond to crises, including greater participation by the private sector.

These reforms are aimed at increasing transparency and accountability in domestic banking systems and international financial institutions such as the IMF. New measures must effectively encourage providers of portfolio capital and banks to analyze and weigh risks and rewards in a more disciplined fashion in both good times and bad. Toward this

end, the industrialized countries must provide better regulation and supervision – including more effective focus on risk management systems in financial institutions. Finally, in the future, new financing mechanisms to combat contagion must include the private sector. Private sector burden sharing is critical, not only because there will not be sufficient official money for all circumstances, but also because it is absolutely essential in inducing market discipline and reducing moral hazard.

These steps should significantly strengthen the international financial system, help to reduce the risk that this crisis could intensify, and promote the prospect of the earliest possible return to growth in emerging markets.

F. Domestic Initiatives

Tax. (Treasury please prepare pending POTUS decision)

Environment. (EPA, CEQ)

Assistance. Adjustment Assistance for Steelworkers and Communities

Assistance for Workers: The Department of Labor has two programs to assist dislocated workers, including steelworkers harmed by increased foreign imports. *Title III of the Job Training Partnership Act (JTPA)* provides funds to states and local grantees to support:

- On-site assistance when major layoffs are announced (“rapid response”);
- Readjustment services such as skill assessment and job search assistance;
- Retraining in demand occupations; and
- Support services such as child care and income support that allow workers to participate in training.

Workers whose jobs are lost to an important degree as a result of increased imports are eligible for the *Trade Adjustment Assistance (TAA) program*. TAA provides an array of benefits and services, including up to 104 weeks of approved training; job search and relocation allowances; and “trade readjustment allowances” (income support) while in training following exhaustion of Unemployment Insurance. (Workers who are subject to recall by their former employers may qualify for trade readjustment allowances, even without entering training, after their UI has been exhausted.)

Since October 1, 1997, the Department of Labor has received petitions seeking TAA certification from workers in 33 steel and steel products plants. DOL has certified 20 of the 33 petitions, covering approximately 3300 workers. DOL is still reviewing the remaining 13 petitions (all of which were received in the last three months), which cover approximately 2600 workers.

Assistance for Communities: The Department of Commerce's Economic Development Administration (EDA) is the major source of assistance for communities hurt by steel imports. Under its Economic Adjustment Program, EDA can provide: 1) strategy or technical assistance grants, to help a community develop an economic adjustment strategy; 2) Revolving Loan Funds (RLFs), to help support small business start-up or expansion activities; and 3) grants for physical infrastructure improvements, including development of a business incubator or industrial park. EDA can respond to an application for a strategy grant in 2-4 weeks; an RLF takes somewhat longer. And through its 12 regional Trade Adjustment Assistance Centers, EDA can provide technical and consultant assistance to small firms affected by foreign competition (e.g., supplier firms to a large steel plant).

In its FY99 budget, the Administration requested \$50 million for a new EDA Office of Community and Economic Adjustment, specifically to assist communities harmed by foreign competition. Although Congress did not approve the new office, it did provide the additional \$50 million for EDA's Economic Adjustment Program, and those funds are now available for, among others, communities harmed by increased steel imports.

III. NEXT STEPS

To be determined based on POTUS decisions

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:30-DEC-1998 09:40:20.00

SUBJECT: FYI: POTUS steel memo

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Nouriel Roubini (CN=Nouriel Roubini/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

From WH morning mtg.: POTUS will probably get to the steel memo while on his Hilton Head trip, rather than before leaving.

JF

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:30-DEC-1998 17:54:46.00

SUBJECT: Detroit speech backgrd: Info on autos

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: BLANK_R (BLANK_R @ A1 @ CD @ VAXGTWY [UNKNOWN]) (CEA)

READ:UNKNOWN

Steven N. Braun (CN=Steven N. Braun/OU=CEA/O=EOP [CEA])

READ:UNKNOWN

TEXT:

We sent the following background memo to NEC. So far the speech just consists of a page of scribbles by Waldman.

JF

----- Forwarded by Jeffrey A. Frankel/CEA/EOP on 12/30/98
11:13 AM -----

Jeffrey A. Frankel

12/30/98 11:12:29 AM

Record Type: Record

To: Gene B. Sperling/OPD/EOP, Michael Waldman/WHO/EOP

cc: Jonathan Orszag/OPD/EOP

Subject: Detroit speech backgrd: Info on autos

I attach a two-page memo on the status of the automobile industry in 1998. This is intended as background for the President's speech to the Detroit Economic Club. If we can be of any further assistance, please let us know.

JF

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D15]MAIL41680346P.326 to ASCII,
The following is a HEX DUMP:

Background on the State of the Motor Vehicle Industry: 1998

Sales: Sales of light motor vehicles in 1998 will be around 15.44 million units, one of the highest years ever. (Final data for the year will be reported by the automakers on Wednesday afternoon, January 6.) Sales were erratic over the course of the year, surging in the second and fourth quarters in response to generous incentives for consumers.

Auto market shares: The Big Three's share in the automobile market has been falling for the past decade and fell 3 percentage points further in 1998 to 58 percent. The loss of market share has not been to foreign-produced automobiles (which have also lost share over the past 10 years, but have been stable recently), but rather to transplants (foreign nameplates assembled in North America). Transplants comprised about 25 percent of new automobile sales in 1998--up from 18 percent in 1991. Of course, transplants employ American workers.

Substitution to light trucks. Light trucks (pickups, minivans, and sport-utility vehicles) have been gaining as a share at the expense of automobiles, rising to 48 percent of light vehicle sales in 1998. As this is a market where the Big-3 dominates (with a stable market share of about 81 percent), their increased sales of light trucks have offset most of the Big 3's loss of automobile sales. The consumer's substitution from cars to light trucks may reflect the influence of CAFE standards which are more restrictive for cars than for trucks.

Imports: The import share of total light vehicle sales has edged up only slightly in the past 2 years to about 13.6 percent in 1998.

Employment: Employment in motor vehicles and parts showed no net change over the course of 1998 (although it dropped sharply in July due to the ripple effects of a strike at some GM locals). Employment in this industry has shown almost no net change since its peak in 1978 (although employment sagged a bit in the 1980s and recovered about 150,000 in the 1990s).

Merger activity: Earlier this year, Daimler-Benz (Germany) merged with Chrysler to form Daimler-Chrysler. There have been rumors of merger talks between the other U.S. and European automakers.

Strikes and Collective Bargaining. The last nationwide 3-year contract was settled in the fall of 1996 and will expire in the fall of 2000. Nevertheless, strikes over local issues have shut down almost all production at GM plants twice over the past 3 years, in March 1996 and June-July 1998. With the "just-in-time" deliveries of auto parts, a strike at one plant can shut down the entire company in a matter of two weeks or so. Under the national agreement, locals are legally allowed to strike only over issues related to safety, subcontracting, and staffing. The main issues in the strikes have been GM's efforts to cut costs by outsourcing as well as GM's investment decisions. GM historically has supplied more of its own parts than have the other automakers. This fact, together with the high UAW wage at GM relative to the independent

suppliers, means that GM has the highest costs among the automakers. GM's efforts to cut costs by outsourcing are likely to continue to be a source of friction.

Inventories: At the end of November, inventories of cars and trucks were close to the desired 60-day supply.

Looking ahead: In the near term, the industry appears optimistic, as revealed by its posted schedules for assemblies in the first quarter--which are set at roughly the same high level as in the fourth quarter of 1998. Over 1999 as a whole, commercial forecasters are projecting a slight decline in motor vehicle sales from this past year's robust pace.

[Automated Records Management System Hex-Dump Conversion]

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:30-DEC-1998 17:55:37.00

SUBJECT: Steel Report to Congress

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

We sent the following comments to NEC.

----- Forwarded by Jeffrey A. Frankel/CEA/EOP on 12/30/98

03:21 PM -----

Jeffrey A. Frankel

12/30/98 03:19:53 PM

Record Type: Record

To: Lael Brainard/OPD/EOP, Malcolm R. Lee/OPD/EOP

cc: Sharon H. Yuan/OPD/EOP, Meg.Lundsager @ Treas.sprint.com @ inet,
PASCUAL_C @ A1 @ CD @ VAXGTWY

Subject: Steel Report to Congress

Please find attached some comments from CEA on the Steel Report to Congress. Feel free to contact either Nouriel Roubini or me if there are questions.

1. The data on import growth from Russia, Japan and Korea do not reveal the fact that import penetration shares for these countries are still relatively small. For example, the Russian import penetration share has increased from about 2% to 3% of the overall US market.
2. The fall in steel import prices represents a global phenomenon due to the Asian and global crisis. Prices of all commodities have fallen, in most cases more than those for steel. So in this sense there is nothing particular about steel prices; they have fallen just because the recession has led to a general fall in commodity prices. The report has repeated references to unfair and illegal trade practices but we did not notice any evidence supporting the argument that dumping has occurred. A reference should be added to the fact the currency depreciations might explain most, if not all, of the decline in import prices.
3. If we were writing this memo, our preferred tone would be: the crisis has led to a slump in the global steel market and we are bearing part of the consequences of this; we should work to restore growth in Asia and the world economy. Instead the tone is: we are flooded with cheap dumped steel because of unfair competition. The Treasury analysis of the crisis and its implication for the steel sector should come first, not towards the end.

4. There are references in three places to the alleged anti-competitive practices of EU and Japan to restrict EU imports of Japanese steel (see pages 7, 9 and 10). It seems to us that 3 repeated references to as-yet unsubstantiated allegations might be too much. The subject should be discussed once, carefully.

5. Some reference to the benefits for users of low steel import prices should be made. There is a broad coalition of steel-users against steel protection; one should refer to the views of such coalition. See the excerpts (reported below) of the December 11 Inside U.S. Trade article for details.

6. The section on import licensing should be dropped or significantly cut if the POTUS decides against this idea.

IMPORTERS URGE CLINTON TO REACT CAUTIOUSLY TO STEEL INDUSTRY DEMANDS

Date: December 11, 1998 - Inside US Trade -

Six trade associations and a number of U.S. companies and consumer groups this week called on President Clinton to carefully weigh the interests of American

manufacturers, distributors, and consumers when responding to demands from steel producers and the steelworkers union to restrict foreign imports.

Restricting steel

imports could hurt jobs in the U.S. steel-consuming industries, increase inflationary pressures, and jeopardize the global economic recovery, they said.

"The interest of steel producers must be balanced with the interests of steel consumers and the U.S. economy as a whole," they said in a Dec. 10 letter to President

Clinton, reprinted below. "As you determine what is fair policy for steel producers, we urge you to weigh carefully the impact of your actions on other segments of the U.S. economy."

The letter pointed out that U.S. steel producers cannot supply all of the U.S. demand, and that the economy depends on steel imports to make up the difference. Failure

to provide an adequate steel supply could lead to job losses in the U.S. steel-consuming industries, which employ more than 40 times more people than U.S. steel mills, the letter to Clinton said.

....

The letter was signed by Caterpillar, Inc., and three other U.S. companies along with the American Institute for International Steel, the Assn. of International Automobile

Manufacturers, International Assn. of Drilling Contractors, the Precision Metalforming Assn. and the Steel Service Center Institute. Noticeably absent is General

Motors, the largest steel user in the U.S., who has previously spoken out against this year's efforts by U.S. steel producers to restrict imports outside the regular trade laws.

The letter comes as the Administration wrestles with its response to industry and congressional demands for action against imports by January 5. It is unclear what if any additional actions the Administration will take, according to informed private-sector sources.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Douglas W. Elmendorf (CN=Douglas W. Elmendorf/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:31-DEC-1998 08:34:21.00

SUBJECT: Re: next chapter for you to edit

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: James M. Treadway (CN=James M. Treadway/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Douglas_W._Elmendorf@oa.eop.gov (Douglas_W._Elmendorf@oa.eop.gov [UNKNOWN])

READ:UNKNOWN

TEXT:

Mike:

I'm in the process of revising chapter 2 in response to interagency comments, so only I have the latest version. Let me know when you want to start editing it.

Doug

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Alan S. Polasky (CN=Alan S. Polasky/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:31-DEC-1998 09:51:11.00

SUBJECT: chap 5 erp

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Janet: Attached is the environmental and elec util deregulation sections. Steve

===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D92]MAIL45491446H.326 to ASCII,
The following is a HEX DUMP:

ENVIRONMENTAL REGULATION AND INNOVATION

Environmental regulation addresses the problem of environmental damage that is an unintended consequence of economic activity. Because generators of pollution do not fully account for the environmental damage imposed on others, they do not have the proper incentive to reduce emissions. Unregulated markets therefore typically generate too much pollution. Well designed environmental regulations can reduce pollution and increase the net benefits of economic activity, i.e., the value of economic goods net of environmental damage.

Environmental policy may have a significant impact on the pace and direction of innovation, which over the longer-term may be of greater importance than its impact on immediate environmental outcomes. In what follows, the interaction of environmental regulation and innovation is examined. The incentive to generate new technologies under alternative forms of environmental regulation is discussed. This is followed by a discussion of the diffusion of existing technology among potential adopters and the role for policy to modify diffusion rates. Some of the major points of this discussion are illustrated with an application to policy regarding global climate change. Finally, evidence is reviewed on the long-run impact of environmental regulation on productivity.

Innovation Incentives under Alternative Forms of Regulation

There are two primary ways to implement environmental regulation: providing economic incentives to reduce emissions, or command and control regulation. Administration policy has moved toward increased use of incentive-based approaches in environmental regulation. The preference for an incentive-based approach is often justified on static cost-effectiveness grounds-- given fixed technology, an environmental goal can be obtained at lowest cost under an

incentive-based approach. A case for incentive-based approaches can also be made on dynamic grounds -- sources may have greater incentives to find new low cost methods of reducing pollution with incentive-based approaches than with command and control regulation.

Examples of incentive-based approaches include tradeable permit systems, emissions taxes, subsidies to reduce pollution and liability rules. With tradeable permits, total emissions are capped by the number of permits issued, but individual sources can choose their own emission levels by buying or selling permits. In 1998, EPA introduced regulations to reduce nitrogen oxides (NO_x) emissions across 22 states plus the District of Columbia. The regulations allow for emissions trading among major industrial and electric utility sources of NO_x emissions. Under the program, sources needing additional permits to cover their emissions can buy permits from sources that reduce emissions below their initial allocation.

With taxes (subsidies), a source pays a fee (receives a subsidy) for activities that cause environmental damage (are environmentally beneficial). If an emission tax equals the damages caused by pollution, a source will have incentives to reduce emissions to the efficient level. Despite the theoretical appeal of emissions taxes, they are rarely used to regulate pollution in the United States. Subsidies, on the other hand, have been used occasionally to encourage the use of more environmentally benign technologies. For example, under the Energy Policy Act of 1992, electricity produced from wind and biomass fuels receives a 1.5 cent per kWh credit.

Liability rules make sources financially responsible for the environmental damage they cause, which gives sources the incentive to reduce damages caused by their activities. For example, the Oil Pollution Act of 1990 makes firms liable for cleanup costs, natural resource damages, and third party damages caused by oil spills into surface waters. Similarly, the Clean

Water Act makes responsible parties liable for the costs of cleaning up hazardous substance spills.

Examples of command and control regulation include technology and performance standards. Technology standards specify the pollution control that sources must use. Performance standards, on the other hand, specify a maximum allowable rate of emissions, usually in terms of emissions per unit of output, but give sources the choice of how to meet the standard. Many environmental regulations combine elements of both performance and technology standards. For example, the 1972 Clean Water Act Amendments required industrial dischargers to meet an effluent performance standard but the standard was set using the “best practicable control technology currently available.” Conversely, technology standards sometimes allow a source to use different technologies if it can demonstrate the technology will achieve the same amount of pollution reduction.

Given existing technology, incentive-based approaches achieve a specified environmental objective at lower cost than command and control regulation. For example, with tradeable permits, those sources that can reduce emissions most cheaply will do so. When the cost of reducing a unit of emissions is less than the market permit price, a source will reduce pollution and sell extra permits. When the cost of reducing a unit of emissions is above the market permit price, a source will pollute and buy additional permits. The end result of allowing trading is that emissions are reduced in the most cost-effective manner. On the other hand, command and control regulation generally will not be cost-effective. Under this type of regulation, emissions reductions do not necessarily occur where it is cheapest to abate. Technology standards may also lock-in a pollution control technology that is unnecessarily costly in the face of changing conditions.

Evaluating the cost-effectiveness of incentive-based and command and control regulation over the longer-term is more complex, however, because pollution control costs are affected by innovation and the two systems may differ in their incentive to innovate. Innovation may be a particularly important factor when environmental regulation is relatively new, where there are unexplored avenues of research and significant learning-by-doing effects.

Box: Recent Trends in Air Quality

Environmental regulations have generated significant benefits in the form of reduced emissions of various pollutants in the U.S. over the past several decades. Emissions of five of six major air pollutants have fallen substantially since the Clean Air Act was passed in 1970, the exception is nitrogen oxides (see chart 5-1). The EPA regulation banning lead additives in gasoline has been largely responsible for the spectacular fall in lead emissions since the 1970s. Lead emissions in 1997 were less than two percent of 1970 emissions.

The improved record on emissions occurred during a period of considerable economic growth. From 1970 to 1997, real GDP expanded by 111 percent, hence emissions per unit of GDP have fallen dramatically since 1970. In certain sectors of the economy, the reduction in pollution per unit of output has been striking. For motor vehicles, emissions per mile of volatile organic compounds has fallen by 81% and for carbon monoxide by 73% since 1970. These impressive reductions in emissions per unit of output could not have taken place without substantial innovation in new processes and products as well as the widespread adoption of these new technologies.

Innovation incentives under incentive-based and command and control regulation

An important criticism of command and control regulation is that there may not be enough incentive for

sources to search for more cost-effective ways to reduce emissions. A technology standard, provides an incentive to develop cheaper new technologies only if it can meet mandated targets and win regulatory approval. With performance standards, there is an incentive to find lower cost ways of reducing emissions, at least to the level of the standard. Beyond the standard, however, there is no incentive for a firm to search for new methods to further reduce emissions. In addition, if the regulatory response to an innovation is to set a stricter standard because the costs of attaining the stricter standard are made "reasonable," sources may be discouraged from searching for innovations.

One way to increase the incentive to innovate under command and control regulation is to commit to the implementation of a strict standard in the future -- a technology-forcing standard. The value of an innovation that lowers pollution control costs increases with the stringency of the standard. However, requiring sources to meet a stringent standard immediately with existing technology may impose large costs. Announcing stringent emissions targets well in advance gives sources the incentive to innovate as well as the time to adopt and implement new technology, which may make the cost of compliance significantly less expensive. [Example - auto emissions regulations and the catalytic converter]

There is a downside to a technology-forcing approach. Because R&D activity is risky, compliance costs may not fall as much as anticipated. If an ambitious environmental quality goal is set and significant innovations fail to occur, the costs of meeting the goal may be quite high. Relaxing the goal at a later date in the face of high costs, which in some sense rewards failure, has its own drawbacks.

Unlike command and control regulation, incentive-based approaches reward sources financially for developing methods that reduce emissions, regardless of the level of current emissions. For example, under tradeable permits, reducing emissions allows the source to increase net sales of permits to other sources. Similarly, under emissions taxes, subsidies to reduce pollution or liability rules, a source reduces its costs (increases its subsidy) for every unit of pollution reduced. Because incentive-based approaches receive a benefit for reducing emissions at all levels and not just to a given standard, there

are greater incentives to innovate than under command and control.

It is important to note that environmental policy may also influence innovation indirectly through changes in relative prices. In the theory of induced technological change, the direction and pace of technological change responds to changes in relative prices as R&D efforts are channeled toward finding production processes that economize on the use of scarce or expensive factors of production. Induced technological change was originally used to explain the introduction of labor-saving technological change in the presence of high wages. Recently, attention has focused on the implications of induced technological change for climate change policy, which is discussed below.

Alternative policies to reduce SO₂ emissions

Regulation of SO₂ emissions from coal-fired electric generating units over the past twenty years illustrates the importance of environmental regulatory structure for cost savings and innovation. The 1977 Clean Air Act Amendments required all coal-fired electric generating units built after 1971 to remove 90 percent of SO₂ from stack emissions, effectively requiring scrubbers. Title IV of the 1990 Clean Air Act Amendments established a tradeable permit program for sulfur dioxide (SO₂) emissions. In Phase I of the program, which began in 1995, permits were allocated to 110 coal-fired electric generating plants. In Phase II, which begins in 2000, the program will be extended to cover virtually all fossil-fuel electric generating plants and will reduce SO₂ emissions to 50 percent of the 1980 emission level.

Under the tradeable permits program, sources that can reduce emissions cheaply, by switching to low sulfur coal for example, can sell permits to sources for which it is more expensive to reduce emissions. Estimates of cost savings just from allowing trading range from 25 to 42 percent.

Changing regulation from command and control to tradeable permits may also spur innovation that results in

additional cost savings. Estimates of the costs of reducing SO₂ emissions in 2010 have fallen substantially over time. In 1990, EPA forecasted that total annual compliance costs for SO₂ emissions reductions in 2010 would be \$4.6 billion. A 1998 study estimated total annual compliance costs at \$870 million in 2010. Original compliance cost estimates will be overstated when they do not adequately incorporate technological advances.

In the SO₂ case, there are other factors besides technological change that help explain the dramatic decline in expected compliance costs. Policy changes that effectively loosened the limit on total emissions after the initial estimates were made may explain part of the difference in cost estimates. Perhaps the single most important factor, however, was the decline in railroad freight rates as a result of railroad deregulation. Coal from the Powder River Basin in Wyoming has the lowest production cost and lowest sulfur content of any coal in the United States. Lower railroad rates reduced the cost of transporting low-sulfur coal from the Powder River Basin in Wyoming to Midwestern utilities. Coal-fired electric generating units already dependent on coal transported from far away gained direct cost savings. Other coal-fired electric generating units found they could reduce emissions at lower cost by switching to low sulfur coal rather than investing in scrubbers.

The experience with the SO₂ program shows several advantages of using incentive-based approaches for environmental regulation. First, even with a given technology, allowing trading lowered compliance costs. Second, with tradeable permits, there may have been added incentives to innovate. Third, tradeable permits allowed sources the flexibility to adapt to changing circumstances rather than being locked into a prescribed method. The Administration has recently adopted rules to allow trading for NO_x emissions and has been a strong proponent for establishing an international tradeable permit system for greenhouse gas emissions.

BOX: Estimates of Ex Ante and Ex Post Environmental Compliance Costs

In part because of the recent experience with regulation of SO₂ emissions, there is concern that initial estimates of compliance costs made prior to implementation systematically overstate actual costs. Recent analysis has looked at the limited number of studies where both pre-implementation and post-implementation cost estimates exist, covering the period from 1972 through the early 1990s. There are cases of both overestimating and underestimating compliance costs. Prior to 1981, compliance costs for nearly all regulations were overestimated. Since 1981, estimates have gotten more accurate and the balance has been more equal. Only one more case has been overestimated than underestimated and there have been more cases with fairly accurate estimates (within 10 percent of ex-ante estimated costs).

There are many challenges to estimating the costs of compliance accurately. Analysts ex ante inevitably base their forecasts on policies as they are being debated, not on policies as they are actually implemented. Since policies are often changed or relaxed in implementation, comparing initial cost estimates to actual costs amounts to comparing two different policies. Ex-ante cost estimates are typically based on the assumption of 100 percent compliance with regulations. Since firms with the highest compliance costs tend to be those who do not comply, cost data that include only complying firms will tend to be lower than estimates based on perfect compliance. On the other hand, to the extent that cost estimates do not adequately incorporate future technological advances, the costs of compliance will be overstated.

Providing for the efficient amount of R&D

It is widely recognized that the volume of R&D activity undertaken in a market economy may be below the level that is in society's best interest. This result may occur because of either generic difficulties with the private provision of R&D or

specific difficulties in the area of environmental policy.

A standard problem with the private provision of R&D is the appropriability problem -- an innovator cannot appropriate the full benefits of the innovation. Innovators may have difficulty appropriating the benefits of innovation where patent protection is incomplete so rival firms can quickly imitate an innovation, or where basic research leads to advances in knowledge that are difficult to patent. There are often important knowledge spillovers from one firm to another. There is strong empirical evidence that the social rate of return from R&D greatly exceeds the private rate of return. Therefore, a strong case for public support for R&D can be made.

There are two additional concerns about private provision of R&D that are specific to environmental policy. First, environmental regulations themselves may impact the appropriability problem. As noted above, under command and control regulation, sources do not receive credit for the value of environmental improvement. As a result, even without the standard appropriability problem there may be too little incentive for firms to innovate. Second, if environmental regulations are either too lax or too stringent, source will not in general have the right incentive to innovate. For example, when pollution is unregulated, there may be no incentive to innovate to reduce emissions or abatement costs.

Incentive-based approaches may generate efficient innovation incentives. A source will have the proper incentive to innovate when the benefits to a source from reducing its emissions include the value of the reduction in damages from reduced pollution as well as the change in its own compliance costs. Sources will have the proper incentive to innovate when incentive-based approaches "get the prices right" in the sense that the market permit price or emissions tax equals the damages from a unit of pollution. In this case, environmental regulation raises no special concerns over and above the standard problems inherent with private provision of R&D.

Federal environmental research funding is concentrated in two areas -- identifying environmental threats, and basic research into solutions to those threats. Basic research into alternative energy sources, pollution abatement technologies,

and remediation technologies can provide the basis for the development of cheaper means to control the environmental impact of economic activity. In 1996, direct Federal investment accounted for nearly 50 percent of the total U.S. R&D expenditure in energy, remediation, and site assessment -- \$4 billion. Such investment is focused on areas of inquiry that are high-risk and offer long-term returns that the private sector has little incentive to fund. The majority of the government's environmental R&D investment is carried out through its system of research laboratories and competitive grants to universities and researchers.

While it is generally the case that private sector incentives to innovate are insufficient, it is important to note that more R&D activity is not always better. Like other investments, R&D activity is justified when the expected benefits of innovation exceed the costs. Of course, it is difficult at the outset to predict the success of an R&D program because the returns are inherently uncertain. As Albert Einstein said, if we knew what we were doing, it wouldn't be research.

BOX: Public-Private Research Partnerships -- PNGV

The Federal government can play an important role promoting R&D when the private sector has limited interest in pursuing an important social objective. For example, the automobile industry's interest in developing significantly more fuel-efficient vehicles has been dampened because low gasoline prices have made consumers less concerned about fuel-efficiency. However, because vehicle emissions are a major source of greenhouse gas emissions and other pollutants, there is societal interest in developing more fuel-efficient vehicles.

In response, the Partnership for a New Generation of Vehicles (PNGV) was established in 1993 with the goal of dramatically increasing the fuel-efficiency of cars and light-duty trucks while maintaining current performance and price. The focus to date has been on developing technologies for a mid-sized sedan that would achieve 80 miles per gallon. The

research needed to reach that goal ranges from basic study of lightweight materials and alternative power sources to applied engineering of new manufacturing processes. To entice firms to join the research endeavor, the government funds basic research, co-funds more applied research and provides access to the extensive federal laboratory system and its experts.

Environmental Policy and Diffusion of Technology

While innovation is a necessary precondition for improved technology, performance gains will not be realized unless new technology is adopted. Regulatory, informational, or other hurdles may block or delay the adoption of new technologies that are more environmentally friendly. There may be a role for policy to encourage diffusion of new technology if consumers or firms do not adopt new technologies as fully or as rapidly as is socially optimal.

There is a widely observed pattern in the diffusion of new technology among the population of potential adopters of the technology. Cumulative adoption of new technology often follows a s-shaped curve. Initially there are few adoptions.

The pace of adoptions increases, slowly at first and then more rapidly. Adoptions reach a peak and then fall as the market approaches saturation. The most direct explanation of this pattern has to do with the spread of information among potential adopters. Initially, the new technology is unknown by virtually all potential adopters. A few pioneers become aware of the new technology and make the decision to adopt. Word of the new technology spreads to those in contact with the pioneers so that adoptions begin to pick up momentum. Finally, as the bulk of the population of potential adopters has learned about new technology, the rate of new adoption slows.

This pattern of diffusion, while providing important clues about adoption decisions, does not answer the policy question of whether the rate of adoption is efficient or not. Failure to adopt technology may be appropriate, reflecting the fact that the costs of adoption exceed the benefits. However, there may be market failures that prevent adoption even when

the benefits of adoption exceed the costs. For policy purposes, it is important to distinguish between these two distinct reasons not to adopt. Only when there are market failures is there a constructive role for policy in promoting the adoption of new technology.

Market failures in adoption may occur because prices fail to reflect the full costs of alternatives. For example, because energy prices may not reflect the full environmental impact from energy use, consumers may not purchase energy-efficient products. The solution to this problem is to “get the prices right” so that consumers face the true costs of their decisions. A different problem is caused by the lack of complete information about new technology. Incomplete information by itself, however, does not necessarily constitute a market failure. In making a private decision about what products to buy, consumers may need to acquire information. Both the costs of acquiring information and the benefits of making a more informed decision accrue to the consumer. In this case, incomplete information does not constitute a market failure. On the other hand, in adopting a new technology, one person may spread information about the technology to others. The benefit of spreading information is typically ignored in the adoption decision. If this problem is pervasive, the solution may entail government provision of information, or requirements on the private sector to provide information. The Energy Policy and Conservation Act of 1975 requires many household appliances to carry energy labels with the product’s energy efficiency rating and an estimate of annual energy costs. The EPA and the Department of Energy also operate the Energy Star program in which energy efficient products display the *Energy Star* label.

Residential Energy Conservation: The Energy Paradox

Studies have found that many consumers are unwilling to invest in energy-efficient products such as compact fluorescent light bulbs, improved insulation materials, and energy-efficient appliances even though the studies suggest that such purchases would save them money. The failure of consumers to make investments that save energy and yield apparent

cost savings for the consumer is referred to as “the energy paradox.”

Consumer investment in energy-efficiency, whether that involves installing better insulation or buying more energy-efficient appliances, typically involves an initial cost followed by future benefits from lower energy bills. Studies have calculated the rate of return for a variety of potential energy efficiency investments. In many cases, these rates of return are higher than typical financing costs. Thus, consumers could expect net economic savings.

There are several possible explanations of the energy paradox. One possible explanation is that consumers face the wrong incentives to invest in energy-efficiency. For example, renters may not make energy-efficient investments if their utility costs are included in the rent and they do not directly reap the benefits from conservation. In such cases, there may be a constructive role for policy to correct the distortion in incentives. Another explanation is that consumers lack information about energy-efficient alternatives. For instance, there is some evidence that providing free information increases adoption rates for energy-efficient lighting. A third explanation of the paradox is that consumers are myopic. There is evidence that people are more attentive to the initial cash expense than to future savings from lower energy bills. Policies that lower the initial cost of purchase may be more effective in encouraging adoption than policies that reduce future energy costs even though the policies are of equal value.

Some analysts think that findings pointing to an energy paradox are artifacts of flawed data or logic. It is argued that engineering data used to calculate estimated energy-efficiency gains are too optimistic; that actual gains for a typical consumer are far less. Consumers may not install insulation or other energy-saving investments correctly, or there may be special features that prevent the investment from performing to rated capacity. It is also argued that the costs of investing in energy-efficiency are underestimated. The time and resources spent learning about energy-efficient investments are not usually factored into the analysis. For some consumers, these costs may be larger than the energy-efficiency savings. Finally, with significant uncertainty about the price of a new technology, consumers may be rational to delay investing even though current

adoption appears to save money. By waiting, a consumer may get a better price and save even more money in the future.

Because adoption decisions may take place at any time, analyses that ignore the effect of uncertainty may overstate the value of current adoption.

There is not clear evidence at present to settle the debate over the energy paradox. However, recent low energy prices combined with implementation of energy efficiency standards and various informational programs seem to have reduced the opportunities for investments that save both energy and money.

Innovation and Diffusion: An Application to Climate Change Policy

Climate change, because of its long-run nature, is an area where it is important to account for potential changes in technology. The Administration's efforts to address climate change incorporate many of the principles discussed above regarding incentives to promote innovation and diffusion of new technology. These efforts are reflected both in achievements in international negotiations and in domestic actions.

BOX: Burning down the house

Emissions of greenhouse gases, primarily from the burning of fossil fuels and deforestation, have led to an increase in the atmospheric concentration of these gases that is 30 percent higher than it was prior to the industrial revolution. Following a "business as usual" path on emissions would lead to a doubling of the pre-industrial revolution atmospheric concentration of these gases midway through the next century. According to climate models, this could lead to global warming of between 1.8 and 6.3 degrees Fahrenheit by 2100. Potential impacts include a rise in sea level, greater frequency of severe weather events, shifts in agricultural growing conditions from changing weather patterns, changes in the availability

of freshwater supplies, threats to human health from increased range and incidence of disease, and damage to ecosystems and biodiversity.

To address the risks of climate change, there has been a series of international negotiations including those in Rio de Janeiro in 1992, Kyoto in 1997, and most recently Buenos Aires in 1998. Building on the 1992 United Nations Framework Convention on Climate Change, the Kyoto Agreement would place binding limits on emissions of greenhouse gases over the 2008 to 2012 period in industrial countries. The Agreement contains several provisions that promote cost-effective reductions of these gases, including the flexibility to trade emissions reductions across gases, international emissions trading, and opportunities to invest in clean-energy projects in developing countries that generate emissions credits for use in industrialized countries.

The Kyoto Agreement embodies a preference for incentive-based environmental regulation by allowing for international emissions trading. Incentive-based approaches provide firms with strong incentives to find low-cost methods of reducing greenhouse gas emissions. Searching for low-cost abatement opportunities increases diffusion of existing technologies as well as provides private sector incentives for R&D for the next generation of technologies. In addition, announcing emissions targets well in advance has similar properties to a technology-forcing standard. This approach both gives firms incentives to innovate and allows firms time to adjust, to replace plant and equipment and incorporate new technology, thereby further lowering the cost of emissions reduction.

In conjunction with the international trading system proposed under the Kyoto Agreement, the Administration supports developing a domestic greenhouse emissions trading program for the 2008 to 2012 commitment period. A domestic trading program will allow sources of greenhouse gas emissions to participate in a market that results in least cost

abatement. Because 85 percent of greenhouse gas emissions domestically comes from the burning of fossil-fuels, the domestic trading program will principally involve the energy sector. Reductions in emissions will require changes in patterns of energy-use.

Box: Energy Consumption: Effect of Prices, Efficiency Gains and GDP Growth

Energy efficiency in the United States is now much greater than it was at the time of the first oil shock 25 years ago. Nevertheless, the United States consumes more energy than it did in 1973. The ratio of energy use to GDP (BTU/\$), which is a measure of energy intensity of output, fell rapidly in the 1970s and early 1980s, though it has remained relatively flat in the 1990s (see chart 5-2). Despite the efficiency gains, total energy use rose by 27 percent between 1973 and 1997 (see chart 5-3), stimulated by population growth and rising per capita GDP. Virtually the entire increase came after 1986, a period of relatively low energy prices. Before 1986, relatively high energy prices had kept energy use flat.

The most dramatic increase in energy use has been in the motor vehicle transportation sector, where annual energy consumption rose 54 percent between 1970 and 1995. The average fuel-efficiency of new passenger cars more than doubled between 1974 and 1996, from 14.2 to 28.7 miles per gallon. Despite this impressive gain in fuel-efficiency for passenger cars, overall fleet fuel-efficiency has not increased as much because of the shift toward light-duty trucks and sport-utility vehicles. In addition, efficiency gains were partially offset by an increase in miles traveled per vehicle and a large increase in total vehicles. The net effect of all of these changes has been a small decline in fuel use per vehicle but a large increase in energy consumption due to

the increase in the number of vehicles (see chart 5-4).

In the residential sector, by contrast, energy use has declined as efficiency gains have more than outpaced increases in the number of households, in average house size, and in the average number of appliances per household. For example, the efficiency of the average new refrigerator improved 192 percent from 1972 to 1996. Per household energy use declined rapidly in the late 1970s and early 1980s but has been stable since.

Overall changes in energy use depend upon efficiency gains on the one hand, increases in population and income on the other, with shifts in consumer behavior often the determining factor. Low energy prices shift demand toward energy-intensive goods and services and result in higher energy use. High energy prices in the 1970s and early 1980s spurred efficiency gains and shifted demand away from energy-intensive goods.

There is evidence that innovations in energy technology, which will be necessary to reach climate change policy goals, are responsive to changes in energy prices. There is a positive relationship between the number of patents in energy fields and current and prior year energy prices. Of course, other factors such as the level of federal funding for energy-related R&D may partially explain this relationship. Other evidence lies in the statistical relationship between energy prices and the ratio of energy use to GDP (see chart 5-2). Evidence indicates that when energy prices are high, the energy to GDP ratio falls. Part of this relationship is accounted for by substitution of other inputs such as labor or capital for energy during periods of high prices and partly this reflects consumers choosing to do without. The fact that the energy to GDP ratio remains lower in the 1990s after energy prices had once again fallen indicates long-lasting changes were made in response to earlier high prices. This is a good signal that innovations have occurred. [ADD: tie to Administration's Economic Analysis]

In addition to directly affecting energy prices, it may be desirable to stimulate innovation and diffusion directly through R&D incentives. The President's Fiscal Year 2000 budget includes continued funding for the Climate Change Technology Initiative (CCTI), a program designed to spur the development and adoption of new energy-saving and carbon-saving technologies through tax incentives and R&D investments. Many of the components of the CCTI reflect recommendations made in a 1997 report by the President's Committee of Advisors on Science and Technology. The Committee found that "the inadequacy of current energy R&D is especially acute in relation to the challenge of responding prudently and cost-effectively to the risk of global climatic change from society's greenhouse gas emissions." By providing public support for energy R&D through the CCTI, the level of innovation will likely increase and offset the appropriability problem associated with this kind of R&D.

The proposed FY2000 CCTI package contains \$X billion over the 1999-2003 period in tax cuts for energy-efficient purchases and renewable energy, including tax credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles, a 15 percent credit (up to \$2,000) for purchases of rooftop solar equipment, a 20 percent credit (subject to a cap) for purchasing energy-efficient building equipment, a credit up to \$2,000 for purchasing energy-efficient new homes, an extension of the wind and biomass tax credit, and a 10 percent investment credit for the purchase of combined heat and power systems. The package also contains \$X billion over this five year period in additional research and development investments -- covering the four major carbon-emitting sectors of the economy (buildings, industry, transportation, and electricity), plus carbon removal and sequestration, Federal facilities, and cross-cutting analyses and research. The FY2000 proposal builds on the FY1999 budget which

included more than \$1 billion in CCTI R&D funding. The FY1999 budget represents a 25% increase over the FY1998 climate change R&D appropriations. (CONFIRM TAX INCENTIVE PROPOSAL FOR FY2000)

Complementing fiscal policy, the federal government can undertake other actions that promote the diffusion of climate-friendly technology. In October, 1997, the President called for a series of steps to reduce energy use in Federal buildings, transportation fleets, and other equipment purchases, and to promote the use of renewable energy sources. As the nation's largest single energy user, the federal government spends nearly \$8 billion each year for power to operate facilities, vehicles and industrial equipment, and over 90% of this energy derives from fossil fuels. The federal government plans to expand its procurement of renewable and less carbon-intensive fuels. These efforts will accelerate the diffusion of new energy efficient and carbon-lean technologies. Further, the federal government's experience with these technologies will demonstrate their applicability and feasibility for other users thereby facilitating diffusion.

BOX: The Rate of Energy Efficiency Improvement

The extent of technological innovation and diffusion significantly affects the rate of an economy's energy efficiency improvement. There are two schools of thought regarding the deployment of technology: the engineering perspective, reflected in "bottom up" models based on physical relationships and known technologies, and the economic perspective, reflected in "top down" models based on theoretical and statistical relationships that link policy variables to private-sector behavior. The bottom up modelers sometimes claim that the top down modelers are excessively pessimistic regarding the scope for technological solutions, and the latter sometimes claim that the bottom up modelers are excessively optimistic about

technology ("there is no free lunch").

These two perspectives differ in their approach to assessing technology development and diffusion, and the subsequent effect on the rate of energy efficiency improvement (EEI) across the economy. The EEI can be thought of as the sum of three factors: market-induced energy efficiency improvement, policy-induced energy efficiency improvement, and autonomous energy efficiency improvement (AEEI). Market-induced improvement reflects the effect of changes in energy prices on consumption decisions. For example, the increase in gasoline prices following the OPEC oil shocks stimulated the development and deployment of more fuel-efficient automobiles.

Policy-induced improvement reflects the effects of policies on energy consumption. Policies that affect the price of energy, such as removing energy subsidies, or implementing a tradable permit system that imputes a price on carbon dioxide, would have an effect comparable to the market-induced component. In addition, non-price policies, such as the provision of information, may increase energy efficiency improvement by promoting the adoption of more energy-efficient technologies. Changes in policy have been important in the past and will continue to be important in the future, including policies that affect the price of energy, deregulation, R&D incentives, public information campaigns and moral suasion from public leaders.

The autonomous component of energy efficiency improvement (AEEI) is that part that would take place even in the absence of policy and market price changes. The gradual structural shift in the United States economy away from basic manufacturing (and agriculture) toward services, which are less energy-intensive, appears to dominate this component.

In practice, it can be difficult to discern each of these three components in an empirical model. Statistical analysis shows that the substantial improvement in energy efficiency in the late 1970s can be largely attributed to the increase in energy prices resulting from the 1973 and 1979 oil price shocks. Once one controls for the effect of price, the remaining energy efficiency improvement is about one percent per year. This residual reflects both the effect of non-price policies and the autonomous rate of improvement. This estimate is subject to a large margin of error --the true parameter could be either

higher or lower. But a best guess is that policy initiatives are needed if total energy efficiency is to increase at a rate faster than this.

Some analysts claim that bottom up modelers are technology optimists because of the improvement in energy efficiency they believe occurs *in the absence of price changes*. They are optimistic about the non-price policy subset of energy efficiency improvement, not the total efficiency improvement that would result with a change in prices. The best statistical estimates illustrate that this particular kind of optimism is misplaced.

The top down economic models are potentially *more* optimistic about the effects of a given price change on energy efficiency improvement. These models can predict from historical data changes in behavior in response to prices without needing to know, in an engineering sense, all specific technologies necessary to achieve an emissions goal. Major structural changes will typically entail the invention of new technologies that in advance are unknown, not just to the typical businessman or household, but also to the engineers building the bottom up model. Only historical statistical experience is capable of providing rough guidance on the extent to which price changes are likely to bring forth new technologies.

The key point is that technology is not in itself a policy. The bottom up models are useful for sketching out some likely technologies to use to reduce consumption of carbon-intensive energy. But any assertions about the costs of reducing emissions of greenhouse gases must be based on estimated relationships between policy levers, innovation, and the behavior of the economy.

The Long-Run Costs of Environmental Regulation

While the development of new technology and widespread adoption and diffusion of available technology can make environmental protection less expensive, some analysts have argued that further environmental protection can be obtained at

little or no economic cost. The energy paradox described above is perhaps one such example. If stricter environmental regulation is costless, then implementing such regulations is unambiguously good because environmental benefits are generated without economic cost. Though it is a difficult proposition to test, the weight of the evidence suggests there are long-run economic costs from imposing stricter environmental regulations.

Are there long-run costs from environmental regulations?

There are several possible ways in which environmental regulations might be a blessing rather than a curse for regulated firms. First, environmental regulations may force firms to reconsider their methods of production, which could lead them to discover new methods that simultaneously lower emissions and cost. By focusing on eliminating emissions, it is argued, firms can save these resources and consequently lower the costs of production. Second, firms subject to strict environmental regulation may gain a comparative advantage vis-a-vis competitors. Firms subject to strict early controls may gain a first-mover advantage over rivals who may also eventually be subject to strict environmental regulations. Third, regulation may cause additional R&D activity. Because there may be significant spillover effects from R&D, all firms may benefit if each has an active R&D program even though individually each firm might not choose to do so without the spur from regulation.

There are many skeptics of the proposition that environmental benefits can be obtained at no cost. Claims of the availability of a free lunch arouse suspicion at least among economists. Skeptics question why firms would not undertake profitable investment without being forced to do so by regulators. Profit-maximizing firms gain by cutting costs and seizing strategic advantages. The profit motive itself should ensure there are no large unrealized cost savings or untapped first-mover advantages. This critique, however, does not address the benefit of additional R&D in the presence of spillover effects. Additionally, difficulties in internal organization may prevent a firm from operating in a manner fully consistent with

profit maximization. However, it is not clear that policies can be designed to overcome these internal organizational problems.

Evidence of the long-run effect of environmental regulation on growth

Neither proponents nor skeptics of the idea that environmental regulations impose no long-run costs are likely to be persuaded by the other side's appeals to abstract theories. Though it is difficult to test this proposition directly with existing data, there is evidence on the long-run productivity consequences of environmental regulation. The bulk of this evidence indicates that increasing the stringency of environmental regulations comes at some economic cost.

A number of studies have analyzed the proportion of the productivity slowdown in the 1970s attributable to increased environmental regulation within specific industrial sectors. These studies generally found a small negative effect of environmental regulation on productivity. Most of these studies found that the percentage of the overall productivity slowdown due to environmental regulation was between eight and 16 percent. However, one recent study of productivity among oil refineries in the Los Angeles area, which are subject to strict air quality regulations, found increased productivity relative to other refineries.

Other studies have analyzed on the economy-wide effect of environmental regulations on productivity. Using data from the Census Bureau's Pollution Abatement Cost and Expenditures (PACE) Survey, studies have found a negative relationship between environmental compliance expenditures and measured productivity. One study found that a \$1 increase in environmental compliance expenditure was correlated with a decrease in measured productivity of approximately \$1.50 to \$2.00. Another study based on a multi-sector model of the U.S. economy, estimated that environmental regulations lowered GNP growth by 0.2% per year over the period from 1974 to 1985. The cumulative effect of environmental regulations was a decline of 1.7% in GNP from what it would have been without these environmental regulations.

There is reason to be cautious about interpreting the results of these studies. The results on the relationship between environmental regulation and productivity may overstate productivity losses because the benefits of environmental improvement are not included. There may be direct and indirect effects of improved environmental quality on productivity. For example, improved environmental quality may contribute to a healthier labor force that is more productive. On the other hand, these studies may understate the costs if they fail to incorporate R&D expenditures or the capital costs of investment in new plant and equipment.

BOX: Is there an environmental Kuznets curve?

Not only may environmental regulations affect productivity, but there may be an effect in the opposite direction from increasing productivity to demands for greater environmental protection. Analyzing data across countries, Simon Kuznets found that income inequality rose with per capita income for low levels of income but fell with increases in per capita income for high levels of income, describing an inverted-U relationship. Several analyses of patterns of emissions of air and water pollutants across countries have shown a similar pattern. Although the early stages of industrialization bring increases in pollution, beyond a certain point further increases in income lead to reduced emissions, perhaps because people become willing to spend some of their higher real incomes on a cleaner environment. If the inverted-U relationship is in fact correct, countries that reach a certain level of development should experience declining pollution levels with economic growth. In other words, growth is not necessarily the enemy of the environment.

Just where the turning point in the relationship between development and environmental quality occurs is important for predicting whether total global emissions are expected to increase or decrease in the near future. If peak pollution levels occur at relatively low per capita income levels, emissions should begin to fall because many populous middle-income

countries (e.g., Mexico) should begin to experience improving environmental quality. However, substantially higher peaks mean that pollution will likely get worse before it gets better. One study found that sulfur dioxide and particulate matter levels peak at per capita income levels below \$8000 [1985\$ - update to more recent figure]. A second study using slightly different data and methods found that per capita emissions of sulfur dioxide, particulate matter, nitrogen oxides and carbon monoxide peaked at substantially higher per capita income levels.

Unlike air and water pollutants that have primarily local effects, greenhouse gas emissions seem to increase with income at all income levels. Because greenhouse gas emissions contribute to changes in the global atmosphere but do not contribute to local pollution, there is little pressure to reduce emissions at the national level. Without international agreements to limit greenhouse gas emissions, the path to a more prosperous world may have ever-increasing emissions.

REGULATION & INNOVATION --

THE EXAMPLE OF ELECTRICITY RESTRUCTURING

This chapter has discussed the interplay between regulation and innovation, illustrating how innovations often necessitate regulatory changes, and, in turn, how regulatory changes can affect the pace and direction of innovation. These themes are illustrated in this section with a discussion of electricity restructuring, an example where technological and organizational innovations have changed the desired form of regulation.

Although other industries have been opened to competition over the past decades (e.g. banking, intrastate trucking, telecommunications), the electricity market, with sales of \$212 billion in 1996, is the largest to be targeted for deregulation. While competition has been introduced at the wholesale (generation of electricity) level, retail electricity markets are still, for

the most part, regulated monopolies. The Administration's Comprehensive Electricity Competition Plan proposes to remove many of the remaining barriers to competition and encourage states to implement retail competition. The goal is to provide consumers access to the wholesale power market while maintaining regulated transmission and distribution systems, which probably remain natural monopolies. This is analogous to consumers' being able to choose their long distance telephone service provider. The plan has five main objectives: (1) encourage States to implement retail competition; (2) protect consumers by facilitating competitive markets; (3) assure access to and the reliability of the transmission system; (4) promote and preserve public benefits; and (5) amend existing Federal statutes to clarify Federal and State authority.

This is an excellent example of how an enlightened regulatory approach by government can remove barriers to private innovation, resulting in both economic and environmental benefits. Economic efficiency can correlate with engineering efficiency -- reducing fuel consumption cuts costs to firms while also cutting pollution into the atmosphere. It illustrates how innovation affects the desired form of regulation and how regulatory changes may affect the pace and direction of innovation.

Innovation Caused a Re-examination of Regulation

The electricity industry has been regulated since the early 1900s, when states began to grant electricity companies exclusive service areas. Utilities were overseen by Public Utility Commissions (PUCs) and guaranteed a "reasonable" rate of return on their investments provided they set reasonable rates and met various social objectives such as universal access.

The justification for regulation was that it was less costly to have one electric utility provide service than to have competing utilities. Firms faced enormous start-up costs in installing generating units, transmission and distribution lines, and individual connections. On the generation side, coal-fired and nuclear plants needed to be very large, over 300 megawatts (MW) capacity, to exploit economies of scale. The capital demands for such a large plant needed to be spread over a large consumer base for the utility to recoup its investment. Duplication of transmission and distribution networks by competing firms caused unnecessary expense. To encourage utilities to incur these large investments and avoid wasteful duplication, states restricted competition by granting utilities monopoly status.

Technological and organizational innovations in electricity generation have removed its natural monopoly characteristics and reduced the need to restrain competition in the generation of electricity. Deregulation in the natural gas industry and the increased availability of gas caused prices to fall. This spurred innovations on the electricity generation side and made combined-cycle gas turbine plants, which can be 100 MW or smaller, competitive with much larger coal plants. In 1994, these technologies contributed to a 35 percent fall in the average size of new fossil-fuel fired generating plants relative to the average size of the existing generators. These changes mean that large users can threaten to generate their own electricity if they are not offered lower rates by utilities. Technologies on the horizon promise further reductions in the efficient size of electricity generation, to the point where even residential users may some day be able to generate their own power.

Understanding how to operate generating plants and the transmission grid independently of each other has improved. To maintain the integrity of the electricity grid, the electricity

demand must always equal the amount being supplied. With fluctuating quantities of energy demanded, generators must be closely coordinated. Until recently, this was taken to mean that generation, transmission, and distribution services needed to be jointly owned. Recently, however, technological and institutional innovations such as computerized controls, Independent System Operators (ISOs), and electricity pools, offer ways to coordinate unaffiliated generators while providing fair, open access to transmission lines while maintaining their integrity.

BOX: Balancing Loads vs. Distribution losses & Heat Production

The trend towards smaller, cleaner, and quieter generating plants along with the physics of electricity transmission and generation have led many to claim that the days of centralized power are numbered. Generating electricity from a fuel source is never perfectly efficient -- some of the energy in the fuel source is lost in the transformation process. This energy typically takes the form of heat which can be captured and used in industrial processes or as space heating if the generator is physically close enough to consumers in need of heat. By doing so, the plant produces two valuable products -- electricity and heat -- for the price of one, a process called cogeneration.

Secondly, even after it is generated, most electricity goes through many steps before reaching the end user. Electricity can be transmitted over high voltage transmission wires for long distances, after which it must be transformed into lower voltage to be distributed, and finally transformed again before it is delivered to consumers. On average, some 10 percent of generated electricity is lost through this chain. On-site electricity generation avoids the majority of these losses, thus increasing efficiency and lowering costs.

In the past, economies of scale in electricity generation, and the nuisance of locating loud and polluting plants nearby, outweighed the incentive for small scale local generation. Those trends are changing as very small scale plants (natural gas fired systems may some day be offered as small as 5 kw, enough to power a single family home) are becoming competitive with large scale generation, and plants are becoming more quiet and less polluting. Extremely clean and nearly silent fuel cells, in which hydrogen is passed through a series of catalysts, producing electricity and water, could be the next generation of electricity production.

These changes do not necessarily imply that we will soon have no need for centralized power. One reason for having an electricity grid is that it pools plants with different production characteristics with consumers with different load profiles. For example, the commercial sector demands electricity during the day while residential demand is concentrated during the mornings and evenings. If each of these groups generated their own electricity, they would each need to have the facilities to meet their electricity requirements. By pooling the groups, the same consumers can be supplied by less generating capacity. Depending on the size of distribution losses and the value of excess heat, it would be wasteful to have two separate plants, one at the office and another one at home when one plant could service both loads.

While electricity is governed by a mix of state and federal regulation, a series of Federal actions since 1978 began to introduce competition at the wholesale (generation of electricity) level. The Public Utilities Regulatory Policy Act of 1978 (PURPA) first opened the door by requiring public utilities to purchase power from expensive renewable and cogeneration sources -- "qualified power." While this saddled some utilities with high-cost, long-term contracts, it

also demonstrated that non-utility owned generators could be integrated into the electricity system and helped spur the development of smaller scale generation technologies. The Energy Policy Act of 1992 went further by creating a new class of independent electricity generating companies who could sell power directly to utilities. In April 1996, the Federal Energy Regulatory Commission (FERC) issued Order 888 requiring public utilities to provide access to their transmission lines at reasonable, non-discriminatory rates.

At the state level, to further these policies and reap the benefits of competition, many utilities are collaborating to create regional or state-wide ISOs for transmission grids which can independently set fair transmission pricing and can contract for network services (back-up power, etc.). There are currently four ISOs in operation and seven others in the planning stages. The jury is still out on whether ISOs or a combination of industry controls and state regulatory action is the most effective way to implement wholesale and retail deregulation. The Administration plan gives states the flexibility to determine how they will implement competition, encouraging a variety of approaches.

States throughout the country are going further to provide consumer choice -- retail competition in electricity markets. Thirteen **[as of Dec.1, update]** States have passed legislation to establish retail competition and a further six States have passed regulatory orders to introduce competition. Many states and utilities across the country have implemented pilot programs and statewide retail competition is currently offered in California, Massachusetts, Montana, and Rhode Island.

Even though states are moving forward, several federal regulations still hamper full competition. For example, the Public Utilities Holding Company Act (PUHCA) of 1935 makes it hard for utilities to cross state lines to compete in each other's markets. The Public Utility Regulatory Policy Act (PURPA) requires public utilities to purchase expensive "qualified power," but does not impose such costs on new competitors. The Administration's electricity

competition plan would remove these and other barriers to competition.

Benefits of Deregulation

The traditional form of regulating monopolies through rate setting did not provide strong incentives for utilities to improve their efficiency or offer new services. By allowing companies to compete to provide energy to consumers, competition forces companies to search for more efficient means of producing and delivering electricity, and to search for new means of providing the energy services desired by customers. In a \$212 billion industry, even small efficiency gains from competition can have large benefits.

Above and beyond direct efficiency gains from producing and delivering electricity, retail competition can encourage firms to offer new products and find innovative ways to reduce overall energy costs. The development of time-of-day metering may allow consumers to shift their purchases away from peak periods and thereby reduce capacity requirements. As discussed previously in this chapter, there appear to be barriers in the markets for energy efficiency. Utility commissions have stepped in to force public utilities to invest in energy efficiency, requiring so-called Demand Side Management programs. In the move towards a competitive industry, utilities are now rethinking such investments. There is no way for a utility to force consumers to keep buying their power once the utility has made an efficiency investment (e.g. bought insulation for the consumer's house). New structures will develop to allow firms to pay for and install energy efficient equipment in return for a share of the subsequent savings. Restructuring, by making it easier to bundle efficiency services with the provision of electricity could provide incentives for increased growth of Energy Service Companies (ESCO's). The

potential role for energy service companies is illustrated by the experience in California under deregulation, where most supply contracts for commercial and industrial customers include an energy management component.

Competition may also permit customers to express, through their purchases, their preferences for environmentally sound electricity. “Green” power marketers have sprung up in many of the states now offering retail competition and in those with pilot programs. For a premium, these marketers sell electricity that is generated with a greater portion of renewable sources than the current mix. If a sufficient number of consumers are willing to pay enough extra for such green power, this will provide a profit motive to encourage the future development of such resources.

The Challenges of a Competitive Market: Environmental and Social Objectives

Regulatory changes bring with them a host of challenges as old ways of meeting various objectives must be re-thought. In the past, Public Utility Commissions (PUCs) had direct oversight over utilities. In some states, PUC’s sought to include environmental considerations in their approval criteria for new generating assets. This encouraged the construction of less polluting generating plants than would have been the case if utilities were allowed to ignore this issue. With competition, however, PUCs lose their ability to influence the composition of electricity supply. If a utility is required to buy more expensive clean energy, its rates would have to reflect the higher costs. With competition, consumers would be able to buy power from other providers who had lower costs because they were not subject to the same provisions.

In a competitive market, unless environmental externalities are internalized through other

means (such as existing environmental regulations), the government must step in to pursue them in new ways. For example, PURPA required utilities to buy power from “qualified” clean generators such as renewable and cogeneration sources. To support the same goals, the Administration proposal includes establishing a market for alternative power. In this case, tradable renewable portfolio standards would be used to promote more environmentally friendly power production. This approach would require each generator to cover a fraction of their total generation from renewable sources. If a seller did not generate enough renewable power by itself, it could purchase credits from companies that exceeded their generation requirement. The Administration’s Competition Plan also includes provisions to establish a “public benefits fund” for supporting affordable electricity service to low-income customers, investing in energy efficiency measures, and other social goals. The fund would be supported by a surcharge on all electricity transmitted over the national grid.

The benefits of deregulation rely on the forces of competition to keep prices reasonable for consumers. Benefits, therefore, depend on the extent of competition in markets. The Administration’s Plan would grant authority to the FERC, the Justice Department, and the Federal Trade Commission to block anti-competitive mergers and to promote competition through divestitures and other means.

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Chapter 2

Macroeconomic Policy and Performance

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1998 in Review

The U.S. economy performed very well in many respects in 1998. Real output increased [3.5] percent over the four quarters of the year, once again exceeding the predictions of most forecasters. Nonagricultural jobs increased about [2.5] million, and the unemployment rate dropped to its lowest average level since 1969 (chart 2-1). The Consumer Price Index experienced its second smallest rise since [1964] (chart 2-2), and other measures of inflation were even more muted.

Yet, the turmoil in foreign economies since the summer of 1997 did not leave the U.S. economy unscathed. Net exports declined sharply during 1998, owing to slow or negative economic growth by a number of our trading partners and a substantial rise in the exchange value of the dollar since early 1997. Moreover, during the late summer and fall, domestic financial conditions--which had been very conducive to economic growth during the preceding several years--became much less favorable. Investors' sudden flight from risk reduced some businesses' access to capital and raised the cost of borrowing for others.

Despite these dampening forces, the economic expansion maintained considerable momentum. A significant factor underlying the strong economic performance was a continued record of responsible fiscal policy, with the Federal government recording its first unified budget

surplus since 1969. The surplus contributed to the low level of interest rates this year, increased the capital available for private investment, and provided a more stable backdrop for private decisions. Monetary policy also provided an important boost to the economy. The Federal Reserve held overnight interest rates steady for much of the year, but it reduced rates three times in quick succession when the financial environment deteriorated in the fall. Following the Federal Reserve's actions, the financial stresses in the United States abated considerably, with risk premiums declining again and debt issuance picking up.

Policy Backdrop

Both fiscal policy and monetary policy made vital contributions to the excellent performance of the U.S. economy during 1998.

Fiscal Policy

The passage of the Omnibus Budget Reconciliation Act of 1993 (OBRA93) marked the beginning of a significant shift toward fiscal restraint by the Federal government. The Balanced Budget Agreement negotiated in 1997 put in place the additional policies needed to bring the unified budget into sustained balance. In fiscal year 1998 (which ran from October 1997 to September 1998), the Federal government capped six years of dramatic budget improvement by recording the first unified budget surplus since 1969 and the largest unified surplus as a share of GDP since 1956. The goal of eliminating the budget deficit by 2002 was accomplished four years ahead of schedule. Net interest payments--the fiscal burden imposed by the large deficits

of the past--remain substantial, at 15 percent of total expenditures and 3 percent of GDP in fiscal year 1998. Excluding these payments, the "primary" budget balance, which shows the difference between tax revenue and expenditures for current needs, reached a surplus of more than \$300 billion.

Although the attainment of a surplus in the unified budget marks a major fiscal milestone, the case for continued fiscal responsibility is strong. Demographic trends point to an aging of the U.S. population that will significantly increase expenditures on Social Security and Medicare.

The emergence of a budget surplus offers the opportunity to prepare for this challenge. Indeed, the unified surplus includes the excess of receipts over benefit payments in the Social Security system, which amounted to \$99 billion in fiscal year 1998. The Administration has insisted that none of the unified surplus be directed to regular appropriations or tax reductions until the future solvency of Social Security is assured. The President has repeatedly reaffirmed this commitment to "save Social Security first," and he intends to lead a bipartisan reform of the Social Security system this year.

Monetary Policy

In conducting monetary policy during 1998, the main focus of the Federal Reserve's concerns shifted from a potential reversal of the favorable trend of inflation to a potential weakening of economic activity. When the year began, the target federal funds rate stood at 5.5 percent, where it had been for the preceding nine months. However, the surge in economic growth during the first several months of the year elevated the concern of the Federal Open

Market Committee (FOMC) that intensifying utilization of resources might lead to a build-up of inflationary pressures. The FOMC did not adjust the federal funds rate in response, but it noted in March that a tightening of monetary policy was more likely than an easing in the months ahead.

Despite the slowing of economic growth in the second quarter, the FOMC believed that the balance of risks still pointed to the possibility of rising inflation over time, so it maintained a bias toward future tightening of monetary policy. Indeed, labor costs accelerated during 1998 in a very tight labor market. However, the rapid deterioration in financial conditions in the late summer and fall persuaded the Federal Reserve that much less restrictive monetary policy was appropriate. The FOMC dropped its bias toward tightening at its August meeting, cut the federal funds rate by 25 basis points at its September meeting, did so again in mid-October in an unusual between-meeting move, and lowered the funds rate yet again at its November meeting. In both October and November, the Federal Reserve Board also cut the discount rate--the rate it charges banks to borrow from the Fed--by 25 basis points, in order to maintain its traditional position below the funds rate. The easing of monetary policy was not a reaction to observed weakness of economic activity but rather a pre-emptive or forward-looking action intended to sustain the expansion. The cumulative 75 basis point reduction in the target federal funds rate brought that rate to 4.75 percent, its lowest value in 4 years.

Turmoil in Financial Markets

1998 was a tumultuous year in U.S. financial markets. The first half of the year

witnessed an extension of the very favorable conditions that had prevailed over the previous several years. Yields on intermediate-term and long-term Treasury securities moved in a fairly narrow band that was centered a little below the levels that prevailed during the latter part of 1997. Most households and firms enjoyed ample access to credit on good terms. Meanwhile, equity prices rose sharply, with most major indexes hitting record highs in July that were 17-28 percent above their values at the beginning of the year.

In contrast, financial conditions during the second half of the year were less favorable for economic activity. Russia devalued the ruble and effectively defaulted on its domestic debt in mid-August, marking a new round of the financial crisis in emerging markets that had begun in Southeast Asia a year earlier. As international financial turmoil worsened, the shift of desired portfolios away from emerging market economies that had been apparent over the previous year intensified, and investors also began to shy away from all but the safest and most liquid assets in the markets of the industrialized countries. (Chapter 6 discusses developments in international financial markets at length.) Among U.S. assets, the shift of investor preferences away from private securities and toward government securities caused the spread between private yields and Treasury yields to spike upward. At the same time, corporate debt issuance slowed sharply, banks tightened terms and standards on business loans, and stock prices fell substantially.

Financial conditions improved markedly after mid-October, partly in response to the interest rate reductions implemented by the Federal Reserve. Risk spreads narrowed, debt issuance accelerated, and stock markets rebounded to new highs. Nevertheless, some American businesses apparently faced more limited access to credit and a higher cost of borrowing at the

end of 1998 than at the beginning of the year.

Components of Spending

Real Gross Domestic Product (GDP) increased [3.5] percent between the fourth quarter of 1997 and the fourth quarter of 1998 (table 2-1). The quarterly pattern of output growth was quite erratic: After surging at a 5.5 percent annual rate in the first quarter, real output increased at a 1.8 percent rate in the second quarter, then accelerated to a 3.8 percent rate in the third quarter, and finally moved down to a [2.8] percent rate in the fourth quarter. This irregular pattern was strongly influenced by sharp swings in inventory investment. Real final sales growth decelerated a fair bit between the first and second halves of the year, with first-half growth of roughly 4-1/2 percent at an annual rate (well above its 3-1/2 percent pace during 1997) and second-half growth of about [3-1/2] percent. Within final sales, net exports created substantial drag during the first half of the year but less drag during the second half. Meanwhile, private domestic spending--consumption, housing, and business fixed investment--slowed markedly during the second half.

Household Spending

Real personal consumption expenditures (PCE) surged during the first half of 1998, increasing at roughly a 6 percent annual rate. PCE growth downshifted during the second half of the year, but its [4-1/2] percent pace still exceeded its growth rate for the four quarters of 1997.

Demand for homes was also very strong. Although real residential investment represents

less than 5 percent of GDP, its growth during 1998 accounted for over 10 percent of total GDP growth. Single-family housing starts hovered at the top of their historical range, while new and existing home sales reached record levels. The percentage of Americans who own their own homes reached an all-time high of 66.8 percent in the third quarter of last year (the latest available data).

Robust growth of household spending during 1998 occurred against a backdrop of extremely favorable fundamentals for the household sector. First, real disposable income maintained its solid uptrend, rising about $[2\frac{1}{2}]$ percent (based on the PCE chain-weighted price index) over the year as a whole. Second, household wealth soared to an extraordinary level--almost six times income--as a result of the dramatic recent runup in stock prices (chart 2-3). This expansion in household resources permitted spending to grow significantly faster than disposable income. Indeed, the personal saving rate--measured as the percentage of disposable income represented by the difference between disposable income and consumer outlays--fell sharply again during 1998. After averaging roughly 5 percent between 1992 and 1994, this rate dropped to about 3 percent in 1996, about 2 percent in 1997, and about $\frac{1}{2}$ percent last year. (Last summer's revision of the measured saving rate is discussed later in this chapter.)

Household spending was also spurred by low interest rates and a ready availability of credit. In particular, housing affordability soared, as thirty-year fixed rate mortgages averaged about $[3/4]$ percentage point below their 1997 values. Both mortgage and consumer credit expanded rapidly during the first three quarters of 1998 (the most recently available data), causing total household debt to increase [faster] than disposable income for the second year in a

row. Nevertheless, delinquency rates on consumer loans remained close to their 1997 values, and delinquency rates on mortgages stayed quite low. Personal bankruptcy filings reached a new record high in the third quarter of 1998, but the rate of increase over the preceding year was well below the pace recorded between 1995 and mid-1997.

Last year's *Economic Report of the President* included an extended discussion of the long-term uptrend in the bankruptcy rate. During 1998 the Congress considered various proposals to reform the bankruptcy law, and both the House and Senate passed reform bills; however, these two groups were unable to agree on a compromise bill before the end of the legislative session. The Administration supports reform of the bankruptcy law that would require both debtors and creditors to act more responsibly: Debtors who have the ability to repay a portion of their debts should do so, but creditors should treat debtors fairly in keeping with the creditors' superior information and bargaining power.

Consumer sentiment was buoyant during 1998, probably reflecting both the favorable fundamentals mentioned above and expectations for continued economic growth. The consumer sentiment index of the Survey Research Center at the University of Michigan posted its highest reading in more than thirty years in early 1998. Attitudes deteriorated somewhat in the fall, but the Michigan index finished the year near the top of its historical range. The Conference Board's consumer confidence index painted a similar picture.

Business Investment

Real business fixed investment grew extremely rapidly during the first half of 1998,

increasing over 15 percent at an annual rate. Sharp gains in purchases of producers' durable equipment (PDE) accounted for more than all of the advance in business fixed investment over the year. Real PDE increased over [15] percent during 1998, exceeding its robust 11 percent average annual growth rate over the preceding three years. Among its components, spending on office and computing equipment surged more than [50] percent in real terms over the four quarters of 1998, while communications equipment and aircraft also increased at [double-digit] rates. (A later section of this chapter examines the causes and consequences of the recent boom in equipment investment, with a particular focus on the role of computers.) PDE growth was much more sedate during the second half of 1998 than during the first half. Slower anticipated growth in sales, weaker profits, and poorer conditions for external finance may all have contributed to the deceleration.

Business investment in structures was rather weak during 1998, falling [a bit] in real terms. Office construction was boosted by low and declining vacancy rates, but other commercial construction was sluggish, and industrial construction was held down by ample factory capacity. Spending in this category may also have been dampened by a considerable tightening in available financing during the third quarter, although conditions in the commercial mortgage-backed securities market improved noticeably by the end of the year.

Investment in business inventories was positive in each quarter of 1998, but the pace of accumulation varied dramatically. Inventories increased \$91 billion in real terms in the first quarter of the year, and the step-up in inventory investment relative to the fourth quarter of 1997 contributed over 1 percentage point to the increase in GDP. However, several quarters of strong

inventory growth apparently persuaded businesses to reduce their rate of stockpiling in the second quarter; in addition, a strike at General Motors led to a decline in motor vehicle inventories. All told, the substantially lower rate of inventory accumulation in the second quarter subtracted over 2-1/2 percentage points from GDP growth. Inventory accumulation ran at a [moderate pace] during the second half of the year. Inventory-sales ratios increased over the course of 1998 in several industries that were especially affected by developments in international trade, but aggregate inventory-sales ratios were little changed, on balance, during the year.

Government

Federal government consumption expenditures and gross investment [contracted] in real terms during 1998 [for the second year in a row]. This category, which is part of GDP, differs from unified budget outlays in a number of ways. Among the most important differences are that the GDP category includes the depreciation of government capital, does not include transfer payments, interest, or grants to State and local governments, and does not include some negative outlays that are instead classified as receipts. Defense purchases represent about two-thirds of Federal consumption expenditures and gross investment. during 1998, a [4-1/2] percent decrease in defense spending more than offset a [4-1/2] percent increase in the smaller category of non-defense spending.

Consumption expenditures and gross investment by state and local governments moved up about [2-1/2] percent during 1998, roughly matching the pace of the previous several years.

Strong growth of household income has boosted income tax collections considerably, and most state governments appear to be in good financial condition.

International Sector

In 1998 the Federal Reserve Board replaced its traditional index of the foreign exchange value of the dollar with several new indexes. New indexes have been developed for three currency groups: so-called “major currencies” that are traded heavily outside of their home markets, currencies of other important U.S. trading partners, and the union of these groups (labeled the “broad index”). For each group of currencies, the Federal Reserve calculates both nominal and price-adjusted indexes. Because the indexes are designed primarily to measure international competitiveness, the weights of the various currencies are based on market shares of U.S. goods in foreign markets and foreign goods in U.S. and third-country markets, and these weights vary over time. Still, the new nominal major currency index tracks the Federal Reserve’s previous index fairly closely over the past 20 years.

The foreign exchange value of the dollar continued its advance during 1997 into the third quarter of 1998, but then fell back. Both the real broad index and real major currency index peaked in August and then declined sharply, ending the year at roughly the same levels they began it. The real index relative to other important trading partners was also little changed, on net. The nominal broad index and nominal major currency index behaved similarly to the corresponding real indexes, but the nominal index relative to other important trading partners increased.

Real net exports dropped roughly [\$150] billion over the four quarters of 1998, holding down the growth rate of GDP (all else equal) by about [2.0] percentage points. The negative contribution of this category peaked in the first half of the year and was considerably smaller in the second half. The current account balance deteriorated during 1998 as well, owing to both the drop in net exports and an increase in net payments of factor income to foreigners.

Real exports declined about [3] percent during 1998, following a 10 percent runup during 1997. This deterioration was attributable to weaker economic activity in a number of foreign countries, especially in Asia, as well as the higher value of the dollar (which itself was related to the contrast between foreign economic developments and U.S. economic strength). Exports fell in [each of the first three quarters] of the year, but then [picked up a little] in the fourth quarter as activity in some crisis-impacted countries stabilized. Real imports posted an [11] percent advance during 1998, a smaller increase than during 1997. Imports were apparently dampened by [slightly slower] GDP growth during 1998, although the rising dollar and price-cutting by foreign producers led to declining import prices.

The Labor Market and Inflation

American labor markets enjoyed another excellent year in 1998, with both employment and real wages rising at impressive rates. Meanwhile, consumer prices increased at the slowest pace since the 1960s, with the exception (by some measures) of 1986.

Employment

Nonfarm payroll employment expanded by about [2.5] million during 1998. The number of manufacturing jobs [slipped a bit], following tiny upticks during 1996 and 1997. However, jobs in the services industry--which accounts for about 30 percent of nonfarm employment--posted another impressive gain. Nonfarm payrolls included nearly 127 million workers by the end of last year, an increase of [17.5] million jobs since January 1993. (Over this period, the increase in jobs reported by firms included in the payroll survey significantly exceeds the increase in jobs reported by households. Part of this difference can be traced to differences in methodology, but the explanation for the remaining discrepancy is unclear.) Over 90 percent of those additional jobs are in the private sector.

The unemployment rate averaged [4.5] percent in 1998, down from 4.9 percent in 1997. After falling for six straight years, the unemployment rate now stands more than [2-1/2] percentage points below its January 1993 value. Indeed, the 4.3 percent rate in April and May of last year was the lowest recorded since February 1970. Another measure of available workers is the sum of those who are looking for work (which is the definition of unemployment in the government survey) and those who would accept a job but have not been looking (so-called "marginally attached workers"). In 1998, this group accounted for only [5.5] percent of the civilian labor force plus marginally attached workers, down from 5.9 percent in 1997 and 7.4 percent in 1994.

The labor force participation rate--the percentage of the population over age 16 that was either employed or looking for work--leveled off in 1998 at 67.1 percent, after trending up between 1995 and 1997. The uptrend resulted from a marked increase in labor force

participation by adult women and a respite from the previous slide in participation among adult men. In 1998 the labor force participation rate for women was just below 60 percent, and the rate for men was almost 75 percent. The employment-population ratio--the proportion of the population age 16 and older with jobs--averaged a record 64.1 percent last year.

Productivity and Compensation

Labor productivity in the nonfarm business sector increased about [2.0] percent during 1998, slightly above the 1.7 percent gain of 1997. Measured productivity rose substantially faster over the past 3 years than between the business cycle peaks of 1973 and 1990, but much of the surge may be attributable to methodological changes and cyclical dynamics. (The forecast section of this chapter discusses recent productivity developments at greater length.)

Compensation rose significantly during 1998. The employment cost index (ECI) for private industry workers moved up [3.6] percent, continuing its acceleration of the previous several years. Wages and salaries increased [4.1] percent, while benefits climbed [2.5] percent. Employer payments for health insurance increased at a faster rate than during 1997 but not as fast as benefits overall, even though some insurers are now raising premiums briskly in order to cover new benefits and repair damaged profit margins. The biggest acceleration in compensation last year was in the finance, insurance, and real estate industry, where the roughly [10] percent advance was well above the 7 percent rise during 1997. The pickup in this area likely reflects bonuses or commissions associated with higher volumes of stock trading, mortgage refinancing, and other financial-sector activity.

Other measures of compensation also showed substantial gains during 1998. For example, average hourly earnings increased [3.7] percent over the year. In contrast to the ECI, this series excludes benefits and covers only production or nonsupervisory workers, among other differences.

Because consumer prices increased so little during 1998, these nominal compensation gains translated into substantial advances in real compensation. The increase in the ECI less the increase in the consumer price index (CPI) was [2.1] percent during 1998, well above the solid 1.6 percent gain during 1997. The real increase in average hourly earnings was [2.5] percent, the fastest real wage growth in more than two decades.

Prices

Inflation fell again in 1998 from its already subdued 1997 pace. The CPI increased only [1.5] percent last year, considerably below the 1.9 percent rise during 1997 and 3.2 percent rise during 1996. The chain-weighted price indexes for GDP and PCE both edged up less than [1] percent during 1998, well below their increases during the previous several years. The CPI rose at its slowest rate since 1986 and its second slowest rate since [1963]; the GDP index rose at its slowest rate since 1961.

Much of the 1998 decline in inflation can be attributed to a significant slide in crude oil prices. Weak demand for oil in Asia and plentiful worldwide supply helped to push down CPI energy prices more than [9] percent for the year as a whole. The “core” CPI--which excludes the more volatile food and energy components--increased [2.3] percent during 1998, just a bit above

the previous year's mark of 2.2 percent. Without the January 1998 technical adjustments in the way the CPI is calculated, the core CPI probably would have increased about 2.5 percent last year, about one-quarter percentage point faster than during 1997. On the other hand, core prices as measured by the chain-weighted price index for PCE excluding food and energy decelerated during 1998, increasing only [1.3] percent compared with a 1.5 percent rise during 1997. The CPI and PCE price index differ in both coverage and methodology, and the wedge between their growth rates has been unusually large and variable of late. But the key point is that--by either measure--core inflation has dropped, on net, over the past several years. Indeed, core inflation has been lower during the past few years than at any time since the mid-1960s.

Several factors helped to hold down core inflation in 1998 despite the strong growth of aggregate demand and very tight labor markets. Part of the reason that wage increases have not put more pressure on prices has been rapid productivity growth. In addition, corporate profits are roughly their largest share of national income during the past 20 years, and some wage increases have been offset by reduced profit growth of late. Another important contribution to low inflation has been declining prices of non-oil imports, as excess capacity in Asia has encouraged foreign producers to reduce their prices, and the runup in the dollar has accentuated the effect. Beyond their direct impact on the prices paid for imports, these overseas developments have discouraged domestic producers from raising their prices as much as they might have otherwise. Inflation was probably also restrained by the substantial increase in industrial capacity in the United States during this expansion. Although the unemployment rate was at a 29-year low in 1998, the capacity utilization rate was about equal to its long-term

average.

Low inflation readings in 1998 were reinforced by the continued slide in expected inflation. Actual inflation depends on expected inflation because workers' and firms' desired wages and prices depend on the expected prices of other goods. According to the Michigan survey of households, the median annual inflation expectation over the next 5 to 10 years was about [2.8] percent in the fourth quarter of 1998, slightly below the 3.1 percent reading in late 1997 and well below the 3.6 percent reading of six years ago. Long-term inflation expectations of professional forecasters are even lower, according to the Philadelphia Federal Reserve survey, but have fallen by a similar amount in recent years.

Financial Markets

Financial markets play a central role in modern capitalist economies, directing savings to individuals, firms, or governments who want to consume or invest them. Movements in the prices of financial assets affect household and business spending by redistributing wealth and changing the cost of borrowing.

Through much of the current economic expansion in the United States, falling interest rates and rising equity prices provided important support to real economic activity. Indeed, the disruptions to foreign financial markets and institutions that began in 1997 initially improved domestic financial conditions, as shifting portfolio preferences helped to further reduce U.S. interest rates and boost U.S. equity prices. The resulting strength in consumption and

investment offset at least some of the dampening effect of the drop in net exports. However, the worsening of international conditions in the summer of 1998 changed the domestic situation dramatically. An intensification of the “flight to quality” restricted businesses’ access to credit and raised the average cost of their borrowing. By the end of the year, a significant easing of monetary policy and somewhat greater confidence in the international economic outlook had produced a substantial improvement in financial conditions.

The Effect of Risk on Interest Rates and Equity Prices

Many of the financial-market developments of the past several years have been linked to changing perceptions of risk. Therefore, to understand these developments, one must begin with the basic relationships between risk, interest rates, and equity prices. The ownership of financial assets involves risk, and because people generally want to minimize the uncertainty they face, they will hold riskier assets only if these assets pay higher expected returns. As a result, changes in perceived risk require adjustments in expected returns.

Consider debt securities, such as bonds. All bonds have “market risk,” which refers to the effect of changes in current yields on bond prices: Because bond holders receive fixed payments, increases in prevailing interest rates reduce the value of outstanding bonds, and decreases in rates raise bond values. Most bonds also have “credit risk,” which refers to the possibility that the bond issuer will default on coupon payments or payment of the bond’s face value. Commercial paper also has credit risk but--because of its short maturity--not much market risk. Bank loans are similar to bonds, and lenders face both market risk and credit risk.

U.S. Treasury securities have essentially no credit risk, because people believe that the

Federal government will always meet its legal obligations. (The only recent threat to this belief was the resistance of Congress to raising the Government's statutory debt limit in 1995, as part of a political dispute over broader budget policy that lasted into 1996. The debt ceiling was eventually increased in time to prevent a Government default.) All private debt securities have credit risk, and the yields on those securities exceed the so-called "risk-free" yield on Treasury debt. Rating agencies assess the likelihood of default by private borrowers. Higher-rated debt is deemed "investment-grade," while lower-rated debt is called "speculative," "high-yield," or "junk." Changes in perceived riskiness affect the spreads between private yields and the risk-free Treasury yield.

Equities clearly involve risk as well. A simple model of equity pricing sets the price of a share of stock equal to the present discounted value of future dividends associated with that share. One risk facing an equity owner is changes in a company's dividends, which are often related to sustained changes in its earnings. Naturally, decreases in expected earnings growth reduce the price of a share relative to current earnings--the familiar price-earnings ratio. Another risk for an equity owner is changes in the discount rate that are applied to earnings. One can view the discount rate as the sum of the risk-free interest rate and a risk premium; increases in either component reduce the price of a share, and thus the price-earnings ratio.

The average return to owning equity has exceeded the average return to owning bonds over most long historical periods in the United States: Between 1946 and 1995, for example, the extra return from holding the S&P 500 instead of Treasury bills averaged almost 7 percent per year. Because equity returns are more variable than bond returns, it is not surprising that

equity returns are generally higher than bond returns. But the magnitude of the difference in returns--known as the "equity premium"--has been larger than can be explained by stocks' greater riskiness and economists' traditional assumptions about investor behavior. The correct explanation for its size remains something of a mystery.

Changing Risk Perceptions and Financial-Market Developments

The behavior of debt and equity markets during much of this economic expansion suggests a substantial stepdown in the perceived risk in U.S. financial assets. Although this trend abated in the summer of 1997, when financial crises enveloped several East Asian countries, it did not reverse in significant measure until the late summer and fall of 1998, when risk premiums increased at an alarmingly rapid rate. By the end of last year, risk premiums were declining again but remained much higher than when the year began.

Setting the Stage: Reduction in Perceived Risk Prior to 1997

In early 1997, both debt and equity markets reflected a significant relaxation in investors' concern about the riskiness of financial assets over the previous several years. Comparing instruments of similar maturity, the spread between the average yield on Baa-rated corporate bonds (the median corporate bond rating in terms of outstanding volume) and the yield on thirty-year Treasury bonds was little changed between the first half of 1993 and the first half of 1997. However, the yield spread between high-yield bonds and ten-year Treasury notes fell by about 1-3/4 percentage points between those two periods, and spreads between bank loan rates

and the federal funds rate dropped as well. Equities also seem to have benefitted from lower risk premiums, with a tremendous bull market increasing price-earnings ratios appreciably between late 1994 and early 1997. However, isolating the effect of risk on equity prices during this period is difficult because of a surge in stock analysts' forecasts of earnings growth.

The observed reduction in risk premiums could have been caused by either an increased willingness to bear risk or a reduction in the amount of perceived risk. Because preferences toward risk probably adjust slowly, the latter explanation is much more likely. But why did risk perceptions change in this way? One possibility was growing speculation that the U.S. economy had entered a "new era," in which faster trend growth of real output, lower inflation, and smaller or less frequent business cycles would be commonplace. Another possibility was a strengthening belief that countries around the world would continue to move toward capitalism. Such a move might raise the expected return to investments in developing countries while reducing the risk of government interference or expropriation; indeed, Table 6-1 and Figure 6-1 document a substantial increase in the flow of funds to developing countries before 1997. The spread of capitalism might also reduce the riskiness of certain investments in the United States, by improving access to overseas markets or limiting the dangers of international conflict.

A Flight to Quality

In the summer of 1997, perceptions of risk began to change. As emerging market economies in East Asia faltered, investors' desired portfolios shifted toward U.S. assets. The quantities of domestic and foreign assets adjusted slowly, because many commitments are

long-term and, in any case, capital flows must be balanced by trade in goods and services and investment income in any given year. However, asset *prices* adjusted quickly, with yields and exchange rates moving to mitigate potential capital flows. Increased demand for U.S. assets--combined with an improving Federal budget outlook and downward revisions to expected inflation--pushed down U.S. interest rates between mid-1997 and mid-1998. Among domestic assets, investors became a little more cautious, but the widening of risk spreads was generally quite limited.

Equity prices were little changed, on balance, during the second half of 1997, but surged again during 1998. The S&P 500 composite index jumped 22 percent between the beginning of 1998 and mid-July, and the NASDAQ composite rose 28 percent. Many stock valuation measures moved further beyond their historical ranges; for example, the ratio of price to lagging four-quarter earnings for the S&P 500 reached almost 29 at the end of the second quarter, the highest mark in at least 40 years and almost double its average value since 1956. Low safe interest rates did not fully explain this phenomenon, as the gap between the earnings-price ratio and the real yield on ten-year Treasury notes--measured by the difference between the ten-year nominal rate and inflation long-term expectations in the Philadelphia Federal Reserve's survey of professional forecasters--was among the smallest in many years.

The extraordinary valuation of equities may have been partly attributable to stock analysts' expectations of very fast earnings growth. However, some market observers worried that these expectations were unrealistic: National income had been rising more rapidly than many economists believed was sustainable, and corporate profits already represented a larger

share of national income than usual. Indeed, accelerating compensation of workers left profits in the third quarter of 1998 (the latest available data) slightly below their year-earlier level.

The flight to quality intensified dramatically during the late summer and fall of last year. The effective default on Russian government debt in August made clear that the dangers of financial turmoil--and the limited ability of international efforts to control that turmoil--were not confined to East Asia. In particular, it heightened fears of possible large-scale capital outflows from Latin America. The resulting uncertainty about future economic and financial conditions around the world caused a sudden, stunning shift in desired portfolios toward safer assets.

Stresses in U.S. Financial Markets

Between the end of July and mid-October, Treasury yields dropped sharply and risk premiums on private debt spiked upward (charts 2-4 and 2-5). The yield spread between Baa-rated bonds and thirty-year Treasury bonds rose almost 80 basis points, roughly matching its peak during the 1990-91 recession. The spread on high-yield bonds relative to ten-year Treasury notes nearly doubled, moving from 3.7 percent on July 31 to 6.6 percent on October 14. Wider risk spreads were apparent in the market for short-term debt as well, with the difference between the average AA-rated commercial paper yield and the 30-day Treasury yield rising from 53 to 118 basis points. The increase in investment-grade bond spreads was more a reflection of falling Treasury yields than rising investment-grade yields (in fact, they were little changed on net), but lower-rated businesses faced substantially higher costs of borrowing.

Part of the widening of spreads reflected greater concerns about credit quality in an

economy that appeared to face an increasing risk of a sharp slowdown. Another part of the widening can probably be attributed to the lesser liquidity of private issues at a time when heightened uncertainty created larger liquidity premiums; we return to this issue shortly. In addition, less risk averse investors (such as hedge funds, which are discussed later in this chapter) faced more cautious lenders and counterparties during this period, which reduced their ability to purchase riskier or less liquid securities.

Market conditions also worsened along several other dimensions. New debt issuance dropped precipitously, with public offerings of nonfinancial corporate bonds falling from \$17 billion in July to under \$9 billion in October [check this]. In the high-yield sector, issuance virtually ceased in September. Dealers were reluctant to manage new offerings, probably owing to the heightened volatility in yields and greater difficulty in placing new securities--especially with substantial outflows from mutual funds investing in high-yield bonds. Some firms substituted bank loans for market financing, and business lending by banks boomed. However, banks were not immune to rising uncertainty about future economic conditions, and they tightened their loan standards and terms.

A further worrisome development was the increasing illiquidity of debt markets, especially after mid-September. Bid-ask spreads widened substantially, and dealers were less willing to enter into large transactions at posted rates. The price of liquidity climbed, too. So-called "on-the-run" Treasury securities are the most recently issued securities at each maturity, and they are traded much more actively than "off-the-run" securities. Because of this greater liquidity, on-the-run issues usually offer yields that are a few basis points below

off-the-run yields of similar maturity, but this gap widened considerably for thirty-year bonds in late September. In addition, the yield spread between Treasury's nominal debt and Treasury's considerably less liquid inflation-indexed debt fell much more sharply during this period than survey measures of inflation.

Equity prices slumped as well. Between July 17 and August 31, both the S&P 500 and NASDAQ composite indexes lost more than 20 percent of their value, falling a little below their levels at the beginning of the year. The Russell 2000 index of small-capitalization stocks had lagged behind other major indexes since the spring, and by the end of August it stood nearly 23 percent below its value at the beginning of the year.

These gyrations in financial markets took a toll on financial institutions. Share prices of money-center banks and investment banks fell much more sharply than the broad equity indexes, in the face of rising concern about exposure to emerging markets, the quality of loan portfolios, and possible losses from securities trading activities. Nevertheless, the underlying strength of the commercial banking system--generally high profits, low delinquency rates and charge-off rates, and ample capital--may have helped to contain the financial-market deterioration. Non-bank lenders that specialize in risky borrowers were badly squeezed, however, and some declared bankruptcy. Moreover, several hedge funds (a type of investment fund discussed in the next section) lost large sums of money, and one large fund narrowly averted default.

All of these developments raised fears of a credit crunch that could have significantly limited firms' access to external financing and thereby slowed capital investment and GDP growth. (Household borrowing did not appear to be hampered by market conditions, as

mortgage rates declined and banks reported no change in terms or standards on consumer loans.)

The Federal Open Market Committee (FOMC) cut the federal funds rate by one-quarter percentage point at the end of September, but market participants' desire for safety and liquidity showed no sign of diminishing. In response, the FOMC cut the funds rate by one-quarter point again in mid-October, explaining that "growing caution by lenders and unsettled conditions in financial markets more generally are likely to be restraining aggregate demand in the future."

The October drop in the funds rate was the first policy change between regularly scheduled FOMC meetings since 1994, suggesting to market participants that the Federal Reserve had taken an aggressive easing posture.

Calm Restored

After the second easing of monetary policy, the stresses in financial markets began to abate. Risk and liquidity premiums fell back a little, and debt issuance picked up in both the investment-grade and high-yield sectors. The FOMC made a third one-quarter point cut in the funds rate at its November meeting, saying that despite an improving situation in financial markets, "unusual strains" were still present.

Financial-market conditions stabilized further during the remainder of the year, although risk spreads remained wider than when the year began. Because of the substantial drop in Treasury yields during the year, it is unclear whether the average business borrowing rate rose or fell on balance. The yield on Baa-rated corporate debt was [little changed] in 1998, but the yield on high-yield debt increased about [1] percentage point. Banks reported a further tightening of

loan terms and standards in November, but average interest rates on their commercial and industrial loans were lower in late 1998 than in late 1997.

Equity markets moved sideways, on balance, between the end of August and early October, but then climbed rapidly to new highs (chart 2-6). Between October 8 and year-end, the S&P 500 gained [19] percent, and the NASDAQ [39] percent. For the year as a whole, the S&P 500 and NASDAQ were up about [15 to 25] percent, but the Russell 2000 lost [more than 10] percent. The Wilshire 5000--the broadest index of U.S. equity prices--finished 1998 roughly [12] percent above its value at the end of 1997, achieving its [nth] consecutive year of double-digit increase.

The striking changes in financial-market conditions over the past year and a half had--and will continue to have--important effects on real economic activity in the United States. Before discussing these effects, however, we examine in greater detail one type of financial institution that was hit especially hard by the turmoil of last year.

Hedge Funds

In late September, a group of large financial institutions urgently invested \$3.5 billion in the hedge fund Long-Term Capital Management (LTCM) in order to prevent its collapse. Representatives of these firms--already LTCM's principal creditors--had been brought together by the New York Federal Reserve Bank, which feared that a sudden failure of the fund could significantly disrupt financial markets. The New York Federal Reserve did not set the terms of the rescue or invest public money. Nevertheless, the episode prompted serious questions about

the economic effects of hedge funds and appropriate public policy toward them.

What are Hedge Funds?

The label “hedge fund” is usually applied to investment funds that are unregulated because they restrict participation to a relatively small number of wealthy investors. No precise figures are available, but the amount invested in hedge funds as of mid-1998 appears to have been around \$300 billion. Hedge funds follow a variety of investment strategies, but they often make combinations of transactions designed to focus their risk exposure on specific outcomes. (Derivatives can be an efficient way to structure these transactions, but are not the only way.) For example, if a fund expects the yield spread between mortgage-backed securities and U.S. Treasuries to decline, it can buy mortgage-backed securities and sell Treasuries “short” (which means selling securities that the fund has borrowed but does not own). Common movements in the yields will be a wash for the fund, but a narrowing of the yield spread will make a profit by increasing the value of the mortgage-backed securities relative to the Treasuries. Of course, the focusing of risk does not eliminate risk, as an unexpected widening of the spread will create a loss for the fund.

Long-Term Capital Management had a variety of investments all over the world focused primarily on the expectation that various financial-market spreads and volatilities would converge to their historical norms. Instead, the flight to quality increased volatility and sharply widened risk spreads in many markets simultaneously, causing many of LTCM’s bets to lose money. Compounding these bad outcomes was the huge amount of borrowing that LTCM had

used to finance its transactions: By leveraging its equity capital so heavily, the fund raised its return when its investment decisions were correct, but reduced its margin for error. Before its final crisis, LTCM had only \$4 billion or so of equity capital, but over \$100 billion of assets and more than \$1 trillion in notional principal of futures contracts and derivatives.

If LTCM had defaulted, its creditors and counterparties would have tried to sell the collateral pledged to them in order to cover their losses. The counterparties would also have tried to re-hedge newly exposed positions, which would have put additional strains on markets at a time when risk and liquidity premiums were already rising sharply. Because many of LTCM's investment positions were quite specialized, or were large relative to their specific markets, rapid liquidation of these positions [or re-hedging?] would probably have caused big swings in market prices. The New York Federal Reserve Bank was especially concerned *not* about the direct losses that would have been incurred by creditors and counterparties, but about the potential impact of large price movements on other investments by these firms and on the investments of many individuals and institutions not associated with LTCM.

By investing several billion dollars of new capital in LTCM, its principal creditors and counterparties prevented the firm's immediate default. These firms probably saved money as a result, because unwinding LTCM's portfolio gradually was expected to be much less disruptive to markets and prices than a sudden liquidation.

Hedge Fund Regulation

Currently, hedge funds face little regulatory scrutiny compared to many other financial

institutions: No government agency is charged with direct hedge fund supervision. However, hedge funds' creditors and counterparties provide some degree of "market regulation" by evaluating the funds' collateral, investment positions, and equity capital before doing business with them. The care exercised by these creditors and counterparties is, in turn, monitored to some extent by the government regulators of those institutions, including the Federal Reserve and Office of the Comptroller of the Currency (for banks), the Securities and Exchange Commission (for broker-dealers), and the Commodities Futures Trading Commission (for futures traders).

Of course, lending institutions' techniques for managing their credit risk are not perfect, and market regulation cannot prevent all hedge-fund problems. Moreover, some other financial firms that are largely unregulated--such as certain broker-dealer affiliates--also engage in leveraged trading strategies. Is additional government regulation of hedge funds and similar institutions warranted?

One justification for regulating financial institutions is to protect those firms' customers and investors. Another justification is to reduce systemic risk--the chance of a general breakdown in the functioning of financial markets. This risk arises largely from the asymmetric information that is intrinsic to capital markets. Because market participants cannot accurately judge the financial health of institutions, bad news about one firm can have a contagion effect on others, reducing their access to capital as well. This externality may have been exacerbated by financial innovation, which has linked the fortunes of financial institutions in more complex and subtle ways. But even if market participants had complete information and fully understood the

risks that their investments entailed, they might take more risk than is socially desirable. No firm has an incentive to limit its risk-taking in order to reduce the danger of contagion for other firms. In addition, some firms take more risk because of deposit insurance, and others because they believe that the government views them as “too big to fail.” Finally, risk-taking is encouraged by the limited liability provided through the bankruptcy law and through managers’ ability to protect their personal wealth if their firms fail.

In spite of these arguments, caution is required before deciding that further government regulation of hedge funds would be desirable. To start, the LTCM situation was truly unusual in terms of both the financial-market environment and the firm itself. Few institutions are as large and leveraged as LTCM was, and its failure would have presented especially large risks during a worldwide flight to quality and liquidity as extreme as the one experienced last fall. One can argue that the risk-management practices of both hedge funds and the firms with which they deal should give more weight to unusual events, and the experience of 1998 may have chastened financial institutions in this regard. In any event, the possible collapse of LTCM last September may have posed greater risks to the functioning of financial markets than the collapse of almost any other hedge fund at almost any other time.

A second point is that eliminating hedge funds or placing severe restrictions on their activities would have real economic costs. Hedge funds play a useful economic role by bearing risk that would otherwise be borne by more risk-averse businesses and individuals. Hedge funds also reduce inefficiencies in asset pricing because they exploit discrepancies in prices relative to economic fundamentals or historical norms. As a result, these discrepancies narrow, increasing

liquidity by ensuring that other market participants can buy and sell securities at consistent prices.

Finally, government regulation of hedge funds might not be very effective. Simply requiring greater public disclosure of hedge-fund investments might accomplish little, since lenders can already demand such information before granting loans. At the same time, determining appropriate capital requirements or investment restrictions for funds that invest in a wide variety of ever-evolving financial instruments would be extremely difficult. In addition, hedge funds whose activities were limited by U.S. regulation could easily relocate overseas, which would hinder the government's ability to monitor their activities without reducing their potential impact on our financial markets.

Financial-Market Influences on Spending

The financial-market developments described in this section have had a significant impact on household and business spending. We now discuss the key channels of influence.

Wealth and Consumption

An increase in an individual's net worth raises the amount that can be consumed in each period of life. Statistical evidence suggests that consumer spending has tended to rise or fall roughly 3 cents for every dollar increase or decrease in stock market wealth (although the evidence does not identify the size of the effect very precisely). This "wealth effect" has usually occurred gradually, but much of the adjustment has been completed within a year. The effect

might be more noticeable today than in the past because of wider ownership of stocks--the Survey of Consumer Finances shows that 41 percent of U.S. families owned stocks directly or indirectly in 1995, compared with 32 percent in 1989--but there is little direct evidence on this point.

The dramatic increase in stock prices over the past few years has provided a significant impetus to consumer spending. Applying the historical relationships cited above to the change in total household wealth (including other assets and liabilities as well as stocks), one could conclude that rising wealth boosted consumption growth by about 3/4 percentage point during 1998 after similar increases during the preceding few years. Robust spending has, in turn, led to a dramatic decline in households' saving out of income, with the personal saving rate falling to an historically low [0.0] percent in the fourth quarter of last year.

The sharp decline in household saving in recent years became more apparent after the annual revision of the National Income and Product Accounts in July 1998. Prior to the revision, capital gains distributions by mutual funds had been included in personal income (like interest payments), which bolstered measured personal saving. But these distributions do not represent current production, and the revised data correctly exclude them from income. The revision lowered the measured personal saving rate, with the downward adjustment larger for more recent years because of more substantial capital gains distributions by mutual funds. The revision had no effect on private saving--because --which had held up better of late ...

Interest Rates and Consumption

Changes in interest rates affect household spending through various channels. Consider a decline in rates. This decline tends to boost the value of stocks and bonds, which has a wealth effect on consumption as discussed above. In addition, lower rates encourage spending on houses, autos, and other durable goods often bought on credit, while reducing the return to saving more generally. Moreover, a rate decline augments homeowners' cash flow by reducing payments on adjustable-rate mortgages and spurring mortgage refinancing. At the same time, lower interest rates work to reduce spending in several ways: Household cash flow is diminished by a drop in interest income, and people who are saving to reach a target level of wealth need to save more to reach that target. On balance, lower rates probably stimulate household spending, and higher rates probably dampen spending, but the magnitude of these effects is unclear.

Nominal interest rates on Treasury securities reached unusually low levels last year. For example, the average ten-year yield was the lowest since [19xx], and at the peak of the financial-market stress in early October, the ten-year yield touched its lowest value since [19xx]. Real Treasury yields (as measured by the difference between nominal yields and survey measures of inflation expectations) were also low, although less exceptionally so. Interest rates facing household borrowers did not fall as sharply as Treasury rates last year; indeed, interest rates on consumer loans from commercial banks, including credit cards, were [quite similar] in 1998 to their values in 1997. But rates on fixed-rate mortgages averaged about [$\frac{1}{2}$] percentage point lower in 1998 than in 1997.

Financial Conditions and Business Investment

For several years through mid-1998, businesses enjoyed ready access to external funding on favorable terms. This circumstance was one of the factors encouraging the brisk pace of capital investment, as we discuss in the following section. Last year's sudden flight to quality changed this situation abruptly--raising borrowing costs for some businesses and limiting the ability to borrow for others. However, one should not overstate the impact of these developments on economic activity. As noted earlier, investment-grade borrowers faced essentially the same cost of long-term debt capital at the end of 1998 as at the beginning, although riskier borrowers faced a higher cost. Financial markets and institutions continued to funnel substantial funds to businesses. Moreover, the burden of servicing existing debt is not overwhelming for most businesses: The aggregate debt-service burden for nonfinancial corporations--measured as the ratio of net interest payments to cash flow--fell roughly in half between 1990 and 1996 and then slipped a little further in the following two years.

The Investment Boom

Business investment in plant and equipment has grown very rapidly during the 1990s. Chart 2-7 shows that real business fixed investment has contributed about one-quarter of total real GDP growth during this expansion, compared with an average of about 15 percent during previous expansions since the Second World War. Outlays for producers' durable equipment have been especially strong, increasing at an annual rate of more than 9 percent in real terms and contributing more than twice as large a share of total GDP growth as during previous expansions.

In contrast, real investment in nonresidential structures has barely changed, on net, contributing almost nothing to output growth during this period.

Causes of the Investment Boom

The pace of investment depends on decisions made by millions of individual firms, each reacting to a variety of forces. Still, one can identify at least four general factors that have contributed to the recent surge in investment.

Rapid Output Growth

One key factor is the rapid growth of output during the past several years. In a simple model, a firm's desired capital stock depends on its expected sales, in addition to the cost of capital and other factors. An increase in expected sales induces an increase in desired capital, which requires investment. The level of investment depends on the *change* in sales; because sales represent the rate at which firms are distributing their output, the change in sales is the "acceleration" of this process, and this sort of model is called an "accelerator model."

A pure accelerator model expresses aggregate investment as a function of several lags of total output growth. The lags capture both a gradual adjustment of sales expectations and a gradual adjustment of the capital stock to its desired level. The capital stock adjusts gradually for two reasons: first, because investment projects take time to complete; and second, because firms may choose to install new capital slowly in order to reduce the cost of the installation. Accelerator models can explain a substantial share of the variation in equipment investment over

the past several decades, and a smaller share of the variation in building of nonresidential structures. Of course, the observed correlation between output growth and investment reflects not only the influence of the former on the latter but also the reverse causality of strong investment boosting output. Nevertheless, strong demand outside of the investment sector in recent years has clearly helped to boost investment demand through this accelerator effect.

Robust Profits

A second factor underlying strong investment has been robust corporate profits. Although profit growth has waned during the past year, economic profits (book profits after inventory valuation and capital consumption adjustments) represented almost 12 percent of national income in the first three quarters of 1998, well above the 1980s peak of about 9 percent.

The increasing share of national income received in profits over the past five years is mirrored by a declining share received in net interest payments (chart 2-8); the sum of these components now represents roughly the same portion of national income as during the 1980s. Thus, much of the runup in profits has been simply a shift in capital income from debt-holders to equity-holders.

After-tax profits--which are the funds available for payments to stockholders and for investment--have also represented an unusually large share of national income in recent years.

Profits can affect investment in two ways. First, high returns to existing capital may help to persuade firms that the return to new capital investment is high as well. Second, high profits allow firms to purchase capital using internal funds, which generally have lower cost than external funds. This difference in cost arises because lenders know less about a firm's

investment projects and financial condition than the firm does. The informational disadvantage creates so-called “agency problems,” which include both moral hazard (firms alter their behavior in ways that raise lenders’ risk without the lenders’ knowledge or acquiescence) and adverse selection (firms that seek external funds will be those with riskier projects). Thus, the asymmetric information between firms and potential lenders raises the cost--and sometimes restricts the quantity--of funds raised in financial markets.

Plentiful External Capital

A third reason for the impressive recent pace of investment has been the ready availability of external funding. In particular, the dramatic reduction in Federal government borrowing has left more resources available for private use. The total supply of loanable funds in the economy is national saving, which equals saving by the Federal government plus saving by households, businesses (in the form of undistributed after-tax profits), and state and local governments. Since 1992, net non-federal saving has declined a bit as a share of GDP, but the surge in Federal receipts relative to expenditures has more than offset that dip (chart 2-9). Over this period, net national saving has more than doubled as a share of GDP, rising from 3 percent to 6-1/2 percent--the highest mark since 1984.

An alternative approach to evaluating the availability of external funding is to focus on the price or cost of those funds--the interest rate--rather than focusing on the quantity. Both price and quantity depend on business investment decisions: A high level of desired investment creates a strong demand for loanable funds, pushing up their cost and perhaps increasing the

quantity of funds saved. Therefore, if desired saving and investment for any given interest rate both increase, the equilibrium interest rate can either rise or fall. This ambiguity makes movements in the cost of borrowed funds an unreliable indicator of shifts in the supply of funds. As already noted, however, the increase in the supply of loanable funds during the past several years came entirely from a reduction in government dis-saving, which is largely independent of investment demand. (It is not entirely independent because part of the improvement in government finances is attributable to the strong economy, which is due in part to strong investment.)

In addition to national saving, another source of funds for investment is capital inflows from abroad. In the national income accounts, domestic investment equals national saving less “net foreign investment,” which is the amount that domestic residents are lending abroad less the amount that foreigners are lending to us. (This equality also includes a statistical discrepancy.) Net foreign investment has been significantly negative on average during this decade, as it was in the 1980s, providing additional resources for domestic investment. As with private domestic saving, however, the net capital inflow depends partly on the demand for investment funds, so it cannot be considered an exogenous cause of strong investment.

Falling Computer Prices

A fourth factor spurring investment during the past several years has been a remarkable drop in the price of computers. (Prices have also fallen for some other capital goods, although less dramatically.) Continued technological advances pushed down the chain-weighted price

index for business computers and peripheral equipment by about [30] percent in 1998, following declines of around 25 percent in both 1996 and 1997. The combination of falling prices, new products, more innovative applications of technology, and concerns about the Year 2000 problem (discussed later in this chapter) has sharply boosted outlays in this area. Between the end of 1995 and the end of 1998, nominal computer spending increased [30] percent, and real computer spending [tripled]. Nominal computer spending is now roughly twice as large as at the end of the 1980s, and real computer spending is nearly [twelve] times as large. This exceptional advance in real computer spending has fueled a significant part of the total growth in real equipment investment.

Implications of the Investment Boom

The 1990s investment boom has generated a significant increase in the Nation's business capital stock. The larger capital stock has benefitted the economy in two important ways--it has helped to restrain inflation by increasing industrial capacity, and it has helped to raise productivity.

Capacity Utilization and Inflation

When the aggregate demand for resources exceeds the available supply, inflation often results. The simplest measure of the utilization of labor resources is the unemployment rate. Inflation generally rises when labor markets are very tight because the competition for workers among firms puts upward pressure on wages; if these wage increases are not matched by

increases in productivity, firms face higher unit costs of production and raise their prices. The unemployment rate has substantial predictive power for inflation, although of course the relationship is far from perfect.

The simplest measure of the utilization of capital resources is the capacity utilization rate. Inflation generally rises when capacity utilization is high because the strong demand for firms' products enables them to raise their prices. The capacity utilization rate reported by the Federal Reserve is the ratio of the actual level of output to a sustainable maximum level of output (or capacity), based on a realistic work schedule and normal downtime. The Federal Reserve produces these numbers--based largely on Census data--for the industrial sector of the economy, including manufacturing, mining, and gas and electric utilities. There is a fairly large positive correlation between this measure of capacity utilization and the acceleration of the core CPI. Simple time series models often include capacity utilization as a predictor of inflation, and several papers have found that the "non-accelerating inflation rate of capacity utilization" (analogous to the non-accelerating rate of unemployment) is close to the mean value of that series.

In light of the historical relationship between the unemployment rate and inflation, many economists have been surprised that the very low unemployment rate of the past several years has not led to an uptick in inflation. Indeed, core inflation has actually dropped, on net, over the past several years. Various factors that may have contributed to this pleasant outcome are discussed in the forecast section of this chapter, but part of the solution to the puzzle may lie in the rapid pace of investment and resulting moderate rate of capacity utilization. Strong

investment has meant that in each of the past four years, annual capacity growth of total industry has exceeded every previous annual growth rate since the beginning of the series in 1967. The overall capacity utilization rate averaged 82.1 percent over the 1967-98 period, and it has stayed close to that level since 1996 despite substantial output growth and rising utilization of labor resources.

Productivity

The accumulation of capital can boost productivity in two ways. First, an increased quantity or quality of capital per worker--called "capital deepening"--raises labor productivity. Second, new capital can embody technological advances or innovative ways of organizing work that raise the productivity of both labor and capital, known as "multifactor productivity." Increases in labor productivity through either capital deepening or multifactor productivity growth boost potential output.

The Bureau of Labor Statistics publishes a decomposition of changes in potential output into changes in the quantity of labor and labor productivity, which is in turn divided into changes in labor quality, the quantity and quality of capital, multifactor productivity, and some technical factors. Between 1989 and 1996 (the most recently available data), capital deepening contributed about .5 percentage point per year to labor productivity growth. Improvements in multifactor productivity contributed .2 percentage point, some of which may be related to capital investment although such an effect is difficult to quantify. Improving labor quality added another .4 percentage point, for a total average increase in labor productivity of 1.1 percentage

points per year.

Some observers are surprised that the rapid pace of computer investment, in particular, has not had a more apparent effect on productivity growth. As noted earlier, measured labor productivity accelerated in the past 3 years, but much of this pickup may be attributable to methodological changes and cyclical dynamics. Why has the "revolution" in information technology not had a larger effect on overall productivity?

Part of the answer is that computers and peripheral equipment still represent less than 5 percent of the total stock of equipment and less than 2 percent of the total stock of business fixed capital. Because computers have virtually the highest depreciation rate of any type of equipment, net investment in computers is much smaller than gross investment. In addition, the small base of computer capital means that many years of brisk net investment would be needed before computers could represent an appreciable share of the capital stock.

Even so, computers could have a large effect on productivity if the rate of return to computer capital were especially high. In conventional growth accounting, such as the calculations made by the Bureau of Labor Statistics, unusually high rates of return to one kind of capital would appear as fast growth of multifactor productivity. However, multifactor productivity does not appear to have increased especially rapidly in the 1990s. Measurement error could play a role here, as a substantial part of the output of computers is intangible and may not be captured in the national income accounts. Yet, mismeasurement of output has been a perennial problem for national income accounting, and whether this problem is worse in the computer age is not clear.

More fundamentally, the full benefits of the dramatic advance of computer technology may still lie ahead of us. Economic historian Paul David has compared the computer revolution to the transition to electric power in the late 19th century and early 20th century. The productivity gains from the electrification of manufacturing reached their peak several decades after the opening of the first central power station. Box 2-1 examines David's hypothesis and considers whether productivity in the information age is likely to follow a similar path to productivity in the electricity age.

Box 2-1.--Paul David's Hypothesis About Computers and Productivity

Economic historian Paul David has compared the computer revolution to the transition to electric power in the late 19th and early 20th century. Drawing on the parallels and contrasts between the two episodes, he argues that an extended process of diffusion may currently be underway, potentially yielding vast productivity gains once "take-off" occurs. (Others have pointed to the original industrial revolution following the development of the steam engine, or other twentieth-century innovations such as the automobile, as providing relevant parallels.)

Manufacturing total factor productivity growth slowed considerably between 1890 and 1913, dropping 3 percentage points from its post-Civil War high. It picked up smartly between 1919 and 1929, with half of the 5 percent acceleration attributable to growth in electric motor capacity. David's work focuses on why the invention of the electric dynamo, which occurred

before the turn of the century, seemingly did not fuel large gains in productivity until many years later.

David attributes this slow diffusion of electric power to the need to build new factories and redesign manufacturing processes in order to take maximum advantage of the new technology. Considerable impediments deterred both producers and purchasers from making a rapid transition to electricity. Atomistic suppliers faced considerable peak-load problems that could be ameliorated only through expanding their service areas. But, this required centralization of regulatory authority in states rather than in localities and the development of the holding company corporate structure. Demanders of power, chiefly manufacturers, found switching to electricity unprofitable compared with the alternative of keeping the existing and still functional plants; only when these older plants depreciated significantly did it make sense to switch. In addition, manufacturers faced loose labor market conditions at the turn of the century that obviated any substitution of expensive capital for cheap labor. Only when European emigration was curtailed during the World War I did real wages rise enough to motivate expansion of the capital stock.

More generally, the transition was slowed by the considerable time required to build up the expertise to exploit the new technology and allow for rapid diffusion. The very structure of factories could be made cheaper and more efficient with electricity; simpler single-story buildings could be used, and the flexibility of wiring and the modularity of the system meant that portions of plants could be shut down one at a time. Yet, with high rates of turnover and low

industry concentration, the requisite pool of talent—experienced electrical engineers and factory architects—was slow to develop, rendering many of these advances unattainable in the short run.

Whether productivity in the information age will follow the path of productivity in the electricity age remains to be seen. The computer revolution is in many ways similar to the transition to electric power. Integrating computers fully into the work environment is not straightforward, and we are clearly still learning how to use computers to organize work more effectively. At the same time, there are reasons not to apply the historical analogy too tightly. On the one hand, computers have already spread through the economy much faster than electric power did, owing at least in part to their plunging prices. On the other hand, the diffusion of the technology may be hampered by problems unique to computers like rapid obsolescence and difficulties obtaining external financing for less tangible complementary investments like retraining and software creation. In addition, the very capital stock that is being augmented by the computer revolution--firms' information structures--by nature must be adapted rather than scrapped outright. David himself warns that we should not take his historical analogy too literally.

Macroeconomic Implications of the Y2K Problem

By now, almost everyone has heard about the so-called Year 2000 problem -- called Y2K for short (or, more colorfully, the “millennium bug” or “millennium bomb”). Many of the programs that our computers run on, and many of the microprocessors embedded in other

electronic products, are in danger of failing to recognize the two-digit date "00" as the year 2000, mistaking it for 1900, possibly resulting in incorrect output or in total system failure. There is a tendency, when one hears about it at first, to think that it can't be that serious, or that it can't be of interest to anyone but technologists. The problem *is* potentially extremely serious, as a consequence of the central role that computer technology has taken in our lives. Problems in one sector may have widespread consequences in others.

There are many conceivable "worst-case" scenarios. Most have to do with disruptions to some critical infrastructure that links the rest of the economy together--such as transportation, power distribution, telecommunications, or finance--disruptions that thereby have effects more-than-proportionate to the size of the sector directly hit. There are those who warn that in January 2000 the planes may stop flying, telephone-switching may be disrupted, financial transactions may be impaired, the power grid may fail, and so on. Some have also been concerned that Social Security recipients might not receive their checks and even that hospital life-support systems might shut down.

The worst-case scenarios have stimulated huge efforts to address Y2K, especially in large corporations and financial markets, and in the U.S. government. (See Box 2-2 [which appears at the end of this section]. A box in Chapter 5 describes the Administration's initiative to encourage sharing among companies of information on Y2K transition.) Also, because the American economy is large, diverse, and resilient, people will find ways around those disruptions

that, despite our best efforts, will inevitably occur. But it is essential to guard against complacency. Some have not yet gotten the message, particularly some smaller companies.

Some foreign countries have only recently gotten the message as well. Thus concern has shifted recently to the international dimension. Y2K problems can be transmitted not just from one company to another, but from one country to another. Australia and Canada are classed with the United States as being relatively far along in efforts to deal with the problem. But some European countries have been diverted by the large task of first converting their information systems to be able to deal with the new European currency, the euro, which came into existence January 1999. Also in Asia, preparations are not as far along as they should be. The reassuring notion that developing countries are not yet as dependent on computers as are industrialized countries is outweighed by the fact that their equipment is more likely to be older and thus not Y2K-compliant.

Those companies or countries that only began work in 1998 are in a race against time. For any that have not yet begun to deal with the problem, it is probably already too late to fix it by the end of the year. In such cases, business continuity planning is particularly necessary.

A few Wall Street forecasters have assigned high odds that the Y2K problem will lead to a serious global recession. Such forecasts seem excessively dire. Even if disruptions turn out to be on the serious side, most likely they will show up primarily as inconveniences and losses in some individual sectors. It is less likely that they would show up as the sort of economy-wide macroeconomic disturbance that can lead to a recession. In other words, the problem will probably not show up noticeably in aggregate economic statistics such as GDP and employment.

However, it would be unwise to say it can't happen -- computer technology is so pervasive in our lives that it is difficult to predict all the possible sources of danger.

Some effects on the demand-side of the economy can reasonably be predicted.

- The need to address the Y2K problem is having a positive effect on demand for computer hardware and software. Based on 10-K reports filed by Fortune 500 firms, the Federal Reserve Board has estimated \$50 billion in total Y2K spending. Indeed this probably helps explain why real investment in computers and peripheral equipment in late 1998 was running more than 60 percent above the level a year earlier. Sometime later this year spending is likely to fall off, as some firms freeze their systems so as not be caught in mid-stream when January 2000 arrives. Subsequently, there may be a second cycle of pent-up computer spending, especially if new Y2K-related problems are revealed.
- There is also a positive effect on the demand for the services of computer programmers. This effect could reverse after 2000 if all goes well. But it may well continue after that date if things go badly, and specific remaining glitches are discovered and need to be fixed, or if there is a backlog of upgrade tasks that had been postponed due to the diversion of programming resources, as is likely. Economists at the Federal Reserve Board have pointed out that the increased demand for computer goods and services may not be showing up positively in GDP, to the extent that it takes the form of firms' reallocation of their own computer support services to work on the problem. To the contrary, they point to

a negative effect on productivity resulting from the diversion of resources from what would otherwise be useful investment, and suggest an estimated U.S. productivity loss of 0.1-0.2 per cent per year in 1998 and 1999.

- Uncertainty over the performance of information and delivery systems might lead firms to stockpile inventories leading up to January 2000. Uncertainty has a positive effect on the demand for inventories, at every stage of production, from raw materials such as oil and other mineral and agricultural products, to retailers' inventories of consumer goods. The Y2K inventory effect should provide a clear boost to GDP in 1999, offset by a corresponding negative effect in 2000. But it is important to note that this possibility implies no particular distortion or other cause for policy response. Given the intrinsic uncertainty created by Y2K, it is rational and sensible, even optimal, for companies to take the precaution of adding a bit to inventories ahead of time. There is no reason to think that the tendency for the private sector to stockpile will be either greater than the appropriate precautionary response or less than it.
- Disturbances in the financial area are also possible. The demand for cash balances, like the demand for inventories, is affected by uncertainty. Risk-averse people may wish to withdraw more than the usual amount of money from the automatic teller machine on the way to their New Year's Eve parties this year. As any macroeconomic textbook shows, an increase in the demand for cash without an increase in the supply of cash can have a contractionary effect on the

economy. Unlike the other factors, however, this one is easily accommodated.

The Federal Reserve has already made arrangements to ensure that banks have the currency they need to satisfy a surge in demand. Thus the demand for money is one part of the macroeconomic equation that need not be a source of concern.

Effects on the supply side -- notably in the sectors mentioned above, such as transportation, power distribution, telecommunications, or finance -- are the source of the more alarming scenarios but are much harder to predict. It is here that the greater risks lie. There is no way to evaluate, for example, whether Y2K glitches in the financial sector will give enough substance to irrational end-of-millennium unease that the result will be self-confirming volatility in securities markets. Banks have reported that Y2K compliance is already an important factor in their decisions to extend credit in certain foreign countries, particularly in Asia and Eastern Europe. A tightening of bank lending in these regions could accentuate the capital scarcity arising from the recent flight to quality.

There is no way of knowing the odds that the problem will lead to a recession in the year 2000. This is not the sort of problem that lends itself to any sort of formal modeling. Macroeconomic models are not built to address scenarios such as a Y2K failure. Also, if one could predict where all the problems were likely to occur, it would be easier to fix them. ("The unpredictable problems are the hardest to predict.") Those who issue pessimistic forecasts of the effects admit freely that they are purely subjective judgments.

One can look at possible historical precedents to see if anything is to be learned about macroeconomic spillover effects: past disruptions of the transportation or power systems due to

strikes, weather events, or technological failures. Almost none of these episodes lasted long enough or affected enough of the economy to show up in macroeconomic terms, i.e., in output and employment. Americans are very adaptable. Often the sectors that are not directly affected find ways to work around the sectors that are, e.g., by substituting one method of package delivery for another. Also, output that is lost in January is often made up in February.

Table 2-2, for example, reports major disasters between 1971 and 1995, most of them weather-related, together with estimates of monetary damages. The adverse impacts on buildings and property, even leaving aside the tremendous human toll, were often large (almost one percent of GDP each, in the cases of Hurricane Andrew in 1992 and the Northridge earthquake in 1994). In economic terms, these damages represent a loss in future consumption -- resources are diverted to replace or repair the capital stock that has been lost or damaged. Yet in most cases, the disruption was not sufficiently great to show up in the year's statistics on output, income, or employment. The same is true of strikes, even those that affect the communications or transportation infrastructure. The UPS strike of 1997, for example, in the end had little discernible impact on GDP, in part because firms and individuals found other ways to deliver their packages. Thus the cost of these disasters was primarily human, not monetary.

To be sure, it could be dangerous to generalize from these precedents. A disruption that affected the entire country, or that lasted more than a few weeks, would offer less scope for substitution. But even when a failure of major power cables in Auckland cut power to the central business district of New Zealand's largest city for four months last year (February 19 to

April 15, 1998), severely disrupting business, the government-estimated effect on the year's GDP growth was small in the end.

To summarize, even if disruptions turn out to be on the serious side, most likely they will show up primarily as inconveniences and losses in some individual sectors, and not in noticeable macroeconomic terms. A survey of 33 professional forecasters showed an average expectation that the Y2K conversion problem would add 0.1 percent to economic growth in 1999 and subtract 0.3 percent in 2000. Given typical yearly fluctuations in GDP, it would be hard to identify effects of this magnitude ex post. The huge efforts underway, both in the government and in the corporate sector, should make it less likely that there will be a truly serious disruption, let alone a recession. Nevertheless, we must avoid complacency. We should continue and redouble our preventive efforts, so that we won't need to put the adaptability of the economy to the test.

Box 2-2.--Preparing Federal Computer Systems for the Year 2000

The Federal Government operates some of the largest, most complex computer systems in the world, which provide services to millions of Americans. At SSA alone, xx systems are responsible for processing xx benefits each year to xx beneficiaries. The Government also does information processing with the States, which administer key Federal programs such as Food Stamps, Medicaid, and unemployment insurance.

Preparing Federal systems for the Year 2000 is an enormous challenge, and agencies have mounted aggressive efforts to ensure that their critical services will not be disrupted by the transition to the new millennium. The Social Security Administration (SSA) was the first agency to begin work on the Year 2000 (Y2K) problem, back in 1989. In 1995, an interagency committee chaired by SSA was formed to coordinate all agency Y2K efforts. The Chief Information Officers (CIO) Council was, in 1996, assigned the responsibility of building on and overseeing the committee's work.

The Office of Management and Budget (OMB) has produced quarterly reports since early 1997 on agency progress to assess, remediate, test, and implement critical systems. OMB has established a goal of having all critical systems compliant by March 31, 1999. As of November 15, 1998, 61 percent were compliant, up from 27 percent a year earlier. A small percentage of critical systems are not expected to meet the March goal, and agencies will produce specific benchmarks for how they will complete work on these systems before January 1, 2000.

Federal payment systems are of particular concern to the public and the economy. Social security and veterans benefits systems are compliant, and the Internal Revenue Service appears well on its way to being able to collect and process tax returns and issue refunds in a timely manner. For Medicare, which continues to face major system challenges, the Health Care Financing Administration is developing contingency plans to ensure that health care funding is not disrupted. State run systems for administering Federal benefit programs are generally in good shape, with a few struggling States receiving increased attention from Federal agencies.

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OMB also works with the agencies to ensure that they have adequate financial resources for addressing the problem. In the fall of 1998, Congress provided a \$3.35 billion emergency fund to ensure that last minute Y2K funding needs are met and that no system will fail for lack of financial resources.

In February 1998, the President's Council on Year 2000 Conversion was created to coordinate Federal Government's overall Y2K efforts. The Council works with OMB to ensure that agencies are making the most effective use of their financial and personnel resources to prepare their systems for the Year 2000. The Council is also concerned with reaching out beyond the Federal Government to promote action on the problem and to offer support to Y2K efforts in the private sector, and among State, local, and Tribal governments, and international entities.

Forecast and Outlook

The Administration Forecast

The Administration projects GDP growth over the long term at about 2.4 percent or possibly 2.5 percent per year--figures that are consistent with the experience so far during this business cycle as well as with reasonable growth rates of its supply-side components. A scatter diagram illustrating the empirical regularity known as Okun's Law (Chart 2-___), plots the

four-quarter change in unemployment against the four-quarter growth rate for real output. According to Okun's Law, the unemployment falls when output grows faster than its potential rate, and rises when output growth falls short of its potential rate. The rate of GDP growth consistent with a stable unemployment rate is interpreted as the rate of potential growth--and is estimated as the location where the fitted line crosses the horizontal axis--in this case between [2.4 and 2.5 percent, (exact figures depend on 98:Q4)].

Components of Long-Term Growth

Labor Force

In the long term, the growth rate of the economy is determined primarily by the growth of its main supply-side components: population, labor force participation, the workweek, and labor productivity (table 2-___). Of these, the most easily understood is the civilian working-age population (those of age 16 and over) which grew at a 1.0 percent annual rate over the past 8 years. The official Census projections point to a growth rate of 1.0 percent through 2008 for this segment of the population.

The labor force participation rate was little changed in 1998, after notable increases in the two previous years. Although no readily apparent explanation emerges for the year-to-year pattern, the resurgence of strong GDP growth in 1996 (following a slower year) as well as welfare reform law passed in the summer of 1996 probably contributed to the overall increase in that year and 1997. Welfare reform required states to move more of their public assistance

caseload into work or work-related activities. Most likely, the boost to participation from these efforts will be spread over the years between 1996 and 2002. Evidence for this effect is the rapid rise in the participation rate for women who maintain families (possible chart). The increase in the participation rate for this group--only 6 percent of the labor force--accounts for one half of the increase in the total participation rate over the past 3 years.

On average, the total participation rate has increased at a 0.1 percent annual rate during the 8 years of this expansion, although the growth rate was lower before 1996 and higher more recently. Looking ahead, the administration expects the participation rate to increase at almost 0.2 percent per year during the phase-in period of welfare reform--that is through 2002-- and then to slow to 0.1 percent per year thereafter.

Productivity

The official measure of productivity in the nonfarm business sector has grown at about a 2 percent annual rate over the past 3 years, substantially faster than the 1.1 percent average annual growth rate between the business-cycle peaks of 1973 and 1990. To assess whether the recent surge in productivity represents an increase in long-term trend growth, one must account for several measurement issues, as well as the cyclical behavior of productivity. One measurement issue concerns the decision by the Bureau of Economic Analysis to switch to using the geometric consumer price index to deflate consumption. This change, which was implemented beginning with last year's annual revisions to the national income and product accounts, raised the annual growth rates of nonfarm output and productivity by roughly 0.2

percentage point per year for 1995 and subsequent years. The change did not apply to earlier years, because last year's annual revision did not reach back that far. If the same methods were applied to earlier years, as they probably will be with the next benchmark revision, the average annual rate of productivity growth since 1973 would be 1.3 percent rather than the 1.1 percent officially reported.

A second measurement issue concerns whether real output is best measured on the product side (the official method) or on the income side--or by a mixture. Since 1993, the average annual growth rates of the income-side measures of output and productivity have been 0.5 percentage point higher than the official product-side measures. Because we learn something from both sides of the accounts, we include the information from both of these series by averaging them--as has been done with the data plotted in chart 2-___. Other, more fundamental, measurement issues exist as well. Box 2-3 [included at the end of this section] discusses attempts to include environmental benefits in measures of national income, as would be required for a comprehensive measure of economic welfare.

In the long-term, productivity increases with training, technology, and capital accumulation. But productivity growth also shows considerable variation over the business cycle, typically falling below its trend during recessions, then growing faster than trend during the mid-expansion, and finally falling again in advance of the business-cycle peak as it did between the business cycle peaks of 1980 and 1990. This cyclical behavior can be captured by a model in which firms partially adjust towards their desired employment, in any quarter because

hiring and firing are costly. As shown in chart 2-__ a simulation from this model reasonably approximates the above-trend behavior of productivity growth in recent years.

The most straightforward conclusion is that the trend growth of labor productivity has not changed much over the post-1973 period and that recent productivity growth reflects primarily cyclical factors. Since 1994, on the other hand, labor productivity has grown faster than the history-based simulation, and it remains possible that the growth rate of trend labor productivity may have evolved upward starting in that year. Weighing these possibilities, the Administration has projected the long-term growth of labor productivity at 1.3 percent--but productivity data over the next year will be watched closely for further evidence of a stronger growth rate.

Box 2-3.--Accounting for the Environment

Economists have long realized that Gross Domestic Product (GDP) is not a true measure of national welfare. Changes in GDP reflect primarily goods and services measured in the market place, which excludes changes in leisure time, health status, environmental quality or other aspects of well-being. Recently, concerns over sustainable development have sparked interest in expanding the system of national income accounts to include environmental quality. Some people worry that economic development may entail deterioration of environmental quality, causing national well-being to fall while measured GDP rises.

In response to environmental concerns, proposals have been advanced for developing a "Green GDP" that incorporates changes in the value of environmental quality and natural

resources into the system of national income accounts. A goal of such an exercise is to develop a more comprehensive scorecard on well-being and sustainable development.

Incorporating environmental and natural resource assets into a unified system of national income accounts is exceedingly difficult. To accomplish this accounting, important aspects of environmental quality must first be measured in physical units. Next, physical units must be translated into a common metric (dollars) via some means of valuation. There is little agreement about valuation for many aspects of environmental quality, or even on methods for establishing values. Establishing the value of reducing the probability of extinction for a species, for example, or the aesthetics of improved visibility from reduced air pollution, raises a host of difficult philosophical and technical issues.

These problems have led many analysts to abandon trying to establish a unified Green GDP approach, at least for the present. One alternative, favored by the statistical branch of the European Union -- Eurostat -- is to report only physical measures of aspects of environmental quality. Under this approach there is no attempt to aggregate various different aspects of environmental quality into a common metric and no attempt to produce an estimate of Green GDP. Rather, the accounts track individual trends of various measures of environmental quality.

An intermediate approach, used by the United Nations System of Environmental and Economic Accounting, is a system of satellite accounts to account for important aspects of environmental quality. Satellite accounts, while developed to be consistent with the system of national income accounts, are not restricted to the same definitions and methods. This

flexibility allows the satellite accounts to focus on issues of particular interest and to be tailored to available information. As information and methods of valuation improve, the system of satellite accounts would move closer to a unified set of economic and environmental accounts.

The satellite accounts approach allows the system of national income accounts to address two fundamentally different needs. There will always be a need for a quarterly measure of market-based goods and services both for government and the private sector, which GDP fulfills.

There is also a demand for a broader measure of well-being, even though it is likely to be less precise and available less frequently, which the satellite accounts can address. There is no need to choose between them.

Inflation: Is It Flat or Falling?

The key to the longevity of this expansion has been surprisingly low inflation rates. Direct measures of capacity, such as the unemployment rate and the capacity utilization rate, play a role in determining whether the economy has reached the limits of its capacity. But in the last analysis, it is the direction of inflation that signals whether or not the capacity limit has been breached. Over the past two years, low and stable inflation has allowed policymakers, both in business and government, to focus primarily on growth rather than bottlenecks.

In addition to its importance for policy, the level and direction of inflation is also an important variable in long-term economic and budget projections. In this context, it is important to note the gap that has developed between inflation as measured by the Consumer Price Index

and the measures of inflation included in the national income accounts. The broadest measure of goods produced in the U.S. is the chain price index for GDP, which increased only 0.9 percent over the four quarters ending in 1998:Q3, a deceleration of almost a percentage point from its year-earlier pace. In contrast, the CPI posted a larger increase--and less deceleration over the past year despite a much higher weight for declining energy prices. The difference becomes striking when one focuses on the contrast between two price measures that appear to have the same coverage: the price index used in the national income accounts to deflate personal consumption expenditures excluding food and energy (the core PCE), and the CPI excluding food and energy (the core CPI). As can be seen in chart 2-____, the core CPI inflation rate has been flat for the past year at about 2.3 percent while the core PCE has slowed from a 1.9 percent increase last year to 1.1 percent this year. Furthermore, the difference that has opened up between these two series has no historical precedent. How could these two measures be showing such a difference?

More than half of the deceleration over the past year in the core PCE is accounted for by price imputations. National income accountants impute prices for components of the consumer market basket for which no nationally-collected price measure exists such as lotteries, insurance, and financial intermediation. One of these price imputations (for "free" checking accounts) slowed sharply over the past year and together with the other imputations account for about half of the deceleration of the core PCE over the past year. Because these imputations tell us little about the course of inflation (they are designed only to fill in some holes in the national accounts), it is more useful to focus on an index that excludes imputations (chart ____).

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Excluding imputations, the index for the core PCE shows persistently lower inflation than in the core CPI, but a gap between the series has opened up over the past few years. The major sources of the difference are the treatment of medical care and housing. The price index for medical care in the PCE has shifted away from using CPI sources and now is assembled from mostly non-CPI sources. Over the past year, medical prices in the PCE index have increased much less (2.3 percent) than the CPI measure of the same concept (3.5 percent). Although the increases in housing prices is similar in both indexes (because the PCE index uses CPI sources), housing is twice as important in the PCE index as in the CPI. The difference in weight, together with an increase in its price relative to the overall index means that housing has also been a source of the difference between the CPI and the PCE inflation measures.

Both measures of inflation have been affected over the past few years by methodological improvements that have tended, on balance, to lower the measured rate of inflation by about [0.5] percentage point [refer to box (not included) discussing methodological changes to the CPI and the PCE price index]. At this time, with no compelling reason to prefer one index to the other, it is best to keep an eye on both.

Whatever the rate of inflation today, in the long run, the inflation measure in the national income accounts will likely gravitate toward unit labor costs--that is the increase in hourly compensation less the rate of productivity growth. Until recently, a measure of trend unit labor costs (that is the ECI measure of hourly compensation less the trend in productivity) has closely matched the rate of price increase in the nonfarm business sector (chart ____). However, a large gap has opened up recently, with this measure of trend unit labor costs increasing at 2.5 percent

over the past 4 quarters (3.8 percent increase in hourly compensation less 1.3 percent productivity growth), while prices in the nonfarm business sector increased only 0.5 percent. The historical pattern suggests that this gap will close and could do so either with higher price inflation, lower wage inflation, or higher trend productivity growth. The eventual outcome may involve all three possibilities, but the inertia in wages and trend productivity growth suggests that most of the correction will come from a higher inflation rate, at least as measured in the national income accounts. If this price measure gravitates upward it will close not only the gap between prices and trend unit labor costs, but also the gap between the price measures from the national income accounts and the consumer price index. Accordingly, the Administration projects that inflation as measured by the GDP price index will rise to 2.1 percent by 2000. At the same time, the CPI is projected to rise at a 2.3 percent annual rate--or about the current rate of increase of the core CPI.

What Has Held Inflation in Check?

The inflation rate has been steady or falling despite an unemployment rate that has been below 5 percent since July 1997. A model of inflation that included only the unemployment rate and inflation expectations would have predicted an pickup of inflation during this period. Holding down inflation over this period has been pressure from the international environment, capacity utilization that is low relative to the unemployment rate, and some methodological changes in the measure of inflation. But even taking these factors into account, the unemployment rate associated with stable inflation (the NAIRU) has probably edged lower.

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Looking at the international environment, the foreign-exchange value of the dollar has risen over most of the past 3 years, both oil and non-oil import prices have been falling, and exporters of U.S. goods face stiff competition. On the import side, prices of nonpetroleum goods have fallen at about a $4\frac{1}{2}$ percent annual rate, on average, during the past 3 years (possible chart). With the share of nonpetroleum goods at about 15 percent of consumption, non-oil imports account for a 0.7 percentage point reduction of consumer price inflation. On the export side, exporters of U.S. goods have cut prices about $3\frac{1}{2}$ percent per year over the past three years, presumably to match stiff competition abroad. With goods exports at about 8 percent of GDP, export prices have subtracted about 0.3 percentage point for the inflation rate as measured by the GDP price index.

Capacity in manufacturing, mining, and utilities has grown a $5\frac{1}{4}$ percent annual rate over the past 3 years outpacing the $4\frac{1}{2}$ percent growth of production. Consequently, the utilization rate has dropped to a level that is now one index point below its long-term average. This slack in capacity is the legacy of a high level of industrial investment and stands in sharp contrast to the tightness in labor markets. Over most of the post-war history, slack in capacity has moved with the unemployment rate and so these two measures usually tell much the same story. However, in current circumstances, the excess industrial capacity offsets some of the tightness in labor markets.

A final reason for the slowing of reported price indexes has been methodological changes to both the CPI and other indexes used in the national income accounts. [possible box, similar to last year's, updated the methodological changes to the CPI and GDP prices]. In general, these

changes reduce the measured rate of inflation. For the CPI, methodological changes made thus far reduce the rate of CPI inflation by about 0.5 percentage point. Changes to be introduced in 1999, will reduce the rate of inflation by an additional 0.25 percentage point.

Without accounting for these changes, a model for the core CPI that includes import and energy prices seriously over predicts the rate of inflation over the past several years (chart 2-___). Having accounted for these changes, the model still over predicts, but only slightly and in a way that is consistent with its past record.

The Near-Term Outlook

Both supply- and demand-side considerations argue for some moderation in real GDP growth from its rapid 3.8 (?) percent annual pace of the past 3 years (Table 2-___). On the supply side, the unemployment rate has fallen about 0.4 percentage point per year over the past 3 years, and it is questionable whether a further decline of this magnitude could be accommodated without inflationary consequences. Labor force growth has not kept up with demand in the past 2 years, nor can it be expected to keep up with a repetition of that kind of demand growth.

On the demand side, almost every major category is expected to grow less rapidly in 1999 than it did in 1998. Consumption, which constitutes two thirds of demand, rose at a 5 percent annual rate in 1998. Growth of consumer spending, which was well in excess of the growth rate of disposable personal income, reflected the remarkable growth of stock-market values. As a consequence, the saving rate fell almost 2 percentage points over the year, finally dropping into negative territory by year-end. Unless the stock market continues to surge, consumption is likely

to grow at a more moderate pace. Continued real income growth is likely to motivate further, but smaller, consumption gains.

Business nonresidential investment grew at an extraordinary 17 percent annual rate in the first half of the year continuing 6 years of double-digit growth. Business purchases of computers, where the rapid pace of innovation is driving new investment and prices have been falling sharply, accounted for much of this growth. But business investment growth fell to ___ percent growth in the second half on 1998. Low capacity utilization may be one factor limiting investment growth. Looking ahead, the (uneven) decline in long-term interest rates in the second half is a positive factor in the investment outlook. As long as the relative price of equipment is falling, it is likely that business investment will continue to grow faster than the economy as a whole.

Strong real income growth, together with the drop in mortgage interest rates over the past year is also buoying residential investment. The [1.60] million unit pace of housing starts so far this year is the highest in a decade. Absent a sudden pickup in the mortgage interest rate, the strength in housing is likely to be maintained in the near term. Even so, experts in the demographics of housing suggest that the pace of housing starts will eventually fall.

Manufacturing and trade inventories also grew rapidly in 1998, but no faster than sales. The inventory-to-sales ratio was thus little changed over the year and remains at one of its lowest levels ever (chart 2-___). Nevertheless, if the components of final demand were to decelerate to a more modest rate in the coming year, then the level of inventory investment would have to drop in order for this lean inventory posture to be maintained.

Some restraint is likely to come from the international economy as the rise in the dollar over the past 3 years and the continued restructuring of several Asian economies has already slowed--and will continue to slow--the demand for American-built products. Because the direction of trade responds with a lag to changes in the exchange rate, the appreciation of the dollar over the past 2 years is likely to boost demand for imports and limit growth of our exports.

Up to now, the Asian economic crisis has not had the negative effect on the U.S. economy that was anticipated a year ago. The consequences of a larger-than-expected drop in import prices has offset much of the direct loss of exports. On the one hand, American exports to the seven Asian countries most affected by the crisis have fallen about \$30 billion dollars since the second quarter of 1997. On the other hand, the weakness abroad has been a major factor lowering the price of imported crude oil, which has fallen more than \$8 per barrel from pre-crisis levels. With the U.S. purchasing about 3½ billion barrels of petroleum and petroleum products per year, the resulting \$27 billion saving on the national oil bill offsets almost all of the loss of Asian export markets. In addition, the drop in non-petroleum import prices and the price discipline imposed on exporters who compete in international markets has held down inflation by about one-half percentage point--as discussed earlier. Low inflation has in turn allowed interest rates to be lower and domestic demand higher than they would otherwise be.

A moderation in output growth to 2.0 percent is projected for the next 3 years--about a half a percentage point below the economy's long-term growth rate but in line with the consensus of professional economic forecasters. In later years, the Administration's forecast is built

around a growth rate for potential output of 2.4 percent per year. The Administration does not believe that 2.4 percent projected growth is the best that the economy can do; rather this projected growth reflects a conservative estimate of the effects of Administration policies to promote education and investment and to balance the budget. The outcome could be even better--as it has been for the past 3 years. But the Administration's forecast is used for a very important purpose: to project Federal revenues and outlays so that the government can live within its means. For this purpose, excessive optimism is dangerous and can stand in the way of making difficult but necessary budget decisions. On the other hand, excessive pessimism can force difficult decisions where none was required. In the final analysis, the only worthy objective is the creation of a sound forecast that points to the eventual outcome using all available information as fully as possible.

As of December 1998, the current expansion had lasted 93 months, the longest peacetime expansion and the second longest on record. There is no foreseeable reason why this expansion cannot continue. As the 1996 *Economic Report of the President* argued, expansions do not die of old age. Instead, post-war expansions have ended because of rising inflation, financial imbalances, or inventory overhangs. None of these conditions exist at present. The most likely prognosis is therefore the same as last year: for sustained job creation and continued noninflationary growth.

Table 2-1.--*Growth of GDP and its Components*
 [1998 numbers to be updated based on revised Q3 and advance Q4 releases]

	Growth rate (percent)		Contribution to GDP growth (percentage points)	
	1997	1998	1997	1998
GDP	3.8	3.5	3.8	3.5
Final Sales	3.4	3.7	3.2	3.6
Consumer Expenditures	3.7	5.2	2.4	3.4
Housing	4.2	11.8	0.2	0.4
Business Fixed Investment	9.8	11.2	1.1	1.3
Government Consumption and Gross Investment	1.4	1.2	.2	.2
Exports	9.6	-2.9	1.2	-.4
Imports	14.0	11.1	-1.9	-1.7
Change in Inventories	--	--	0.5	-.2

Note.--Contributions are approximate. Detail may not add to totals because of rounding.
 Source: Department of Commerce (Bureau of Economic Analysis).