

United States: Selected Issues

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UNITED STATES OF AMERICA

Selected Issues

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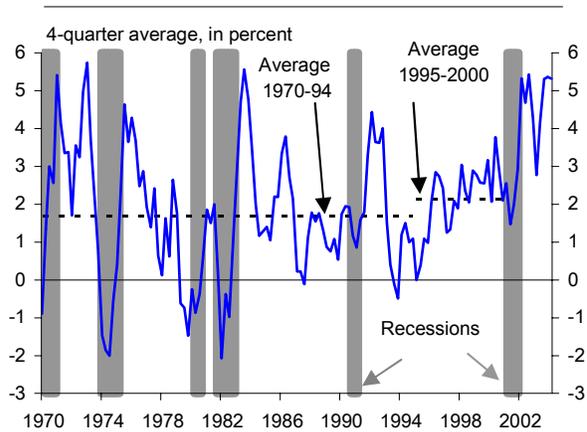
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I. INFORMATION TECHNOLOGY, PRODUCTIVITY, AND THE RECOVERY¹

1. ***Over the period 1995–2000, labor productivity in the U.S. business sector advanced at an average 2½ percent, almost twice as fast as in the previous two decades.***

A large body of research has attributed this acceleration to rapid investment in information and communication technology (ICT), itself reflecting brisk technological change and tumbling prices. Although spending on ICT has moderated significantly since 2000, labor productivity accelerated even further, growing at an average 3¾ percent over 2000–03 (Figure 1). These developments suggest that trend U.S. labor productivity growth has indeed risen, but still leave open the question whether the recent pace can be sustained.

Figure 1. Labor Productivity Growth



Source: Haver Analytics.

2. ***This chapter examines the role of ICT in the recent acceleration of labor productivity growth.*** The analysis finds that the increase of total factor productivity (TFP) growth is a broad phenomenon that encompasses non-ICT producing sectors, consistent with the view that ICT is a “general purpose technology,” and that changes in business processes and operations in response to ICT and competitive pressures have been critical for boosting productivity. Both these factors suggest that recent gains may be sustainable.

3. ***The chapter also investigates whether the productivity boom may have dampened employment in recent years.*** On the basis of two different models assessing the impact of technology shocks on output and employment, the results indicate that the ICT-related acceleration of labor productivity growth has only provided a modest direct contribution to the so-called “jobless recovery.”

A. ICT and Productivity Acceleration: Can It Be Sustained?

4. ***Several studies have measured the contribution of ICT to the acceleration of U.S. labor productivity growth within a growth-accounting framework*** (Oliner and Sichel, 2002; Jorgenson, Ho, and Stiroh, 2004; CEA, 2003; and Basu and others, 2003). This framework identifies three channels through which ICT can affect labor productivity growth:

¹ Prepared by Roberto Cardarelli and Pau Rabanal.

- Improved efficiency in the production of ICT goods, reflected in higher TFP growth in this sector;
- Capital deepening through the greater use of ICT capital in all sectors;
- Improved efficiency in the production of a large number of goods and services, induced by the reorganization of production processes following the adoption of ICT capital and, possibly, ICT-related network externalities, reflected in the widespread acceleration of TFP growth across sectors.

5. ***An initial explanation of the post-1995 acceleration of labor productivity growth emphasized the role of efficiency gains in the ICT-producing sector.*** The first two of the above channels were seen as linked, in that higher efficiency in the production of ICT goods (indicated by faster TFP growth in the ICT-producing sector) caused a rapid decline in relative ICT prices, generating strong investment in new technologies. Falling prices and a highly elastic demand for ICT products also resulted in a significant increase in the ICT sector's share in the overall economy. Taken together, these factors have been found to account for between 40 and 60 percent of the aggregate labor productivity acceleration after 1995 (Table 1).

	Gordon (2003b)		CEA (2003)		Jorgenson, Ho, and Stiroh (2002)	
	1973– 1995	1995– 2002	1973– 1995	1995– 2002	1977– 1995	1995– 2000
Labor productivity	1.4	2.6	1.4	3.1	1.2	2.2
Capital deepening	0.7	1.2	0.7	1.3	0.9	1.4
ICT capital	0.4	0.9	0.4	0.8	0.5	1.0
Other capital	0.3	0.3	0.3	0.4	0.5	0.4
Labor quality	0.3	0.3	0.3	0.3	0.2	0.2
TFP	0.4	1.2	0.4	1.6	0.1	0.6
ICT	0.3	0.7	0.2	0.3	0.3	0.4
Other sectors	0.1	0.5	0.2	1.3	-0.1	0.2

6. ***The acceleration of TFP growth, however, seems to be widespread and not limited to the ICT sector.*** Economy-wide productivity gains would likely not be sustainable if they remained highly dependent on prospects in the ICT sector. Even if the pace of technological advance was maintained, doubts have been expressed on whether the demand for ICT products would remain as elastic as in the late 1990s, given the possibility of saturation (Gordon 2003a).² However, new technologies can generate a long-lasting acceleration of labor productivity if they stimulate complementary changes in business practices, e.g., in production processes and organizational structures, which generate further efficiency gains (De Long and Summers, 2001). Such changes have been found to occur after the introduction

² The fall of high-tech stock market valuations and declining ICT spending since 2001 seemed to corroborate this skepticism (UBS, 2002).

of new “general purpose technologies”, for example, electrification at the end of the nineteenth century.³

7. ***The broad-based acceleration of TFP growth after 1995 is consistent with the “general purpose technology” nature of ICT.*** Staff estimates of TFP growth in 25 U.S. industries show that the trade sector was a major contributor to the acceleration of aggregate TFP growth between 1995 and 2000 (Figure 2).⁴ Over this period, TFP growth also accelerated strongly in the Finance Insurance and Real Estate (FIRE) sector.⁵ These results are consistent with a large body of recent work that has documented the rapid increase in TFP growth throughout the economy. CEA (2003) reports that TFP productivity growth outside the ICT sector increased from $\frac{1}{4}$ to $1\frac{1}{4}$ percent per year, accounting for about three-quarters of the overall TFP acceleration in 1995–2002 relative to 1973–95. Similar results were obtained by Basu and others (2003). In their latest round of estimates of U.S. labor productivity growth reported in Gordon (2003b), Oliner and Sichel find that TFP growth outside the ICT sector accounted for 40 percent of aggregate TFP growth after 1995, up from one-quarter in the pre-1995 period (see Table 1).

8. ***The post-1995 acceleration of TFP growth appears closely linked to ICT investment*** (Figure 3). A growing literature has suggested potential channels for ICT to affect economy-wide productivity, while also addressing significant measurement challenges:

- Basu and others (2003) discuss the difficulties in measuring investment in intangible capital, such as the reorganization of production processes that follow and complement the adoption of new technologies.⁶ This may initially divert resources from current production, reducing measured output and TFP when firms start investing in ICT. Over time, however, the service flow from the accumulated stock of intangible capital may raise output and TFP. This evidence is consistent with the fact that TFP growth tends to be positively correlated with past ICT investments.
- Using a sample of about 600 U.S. firms between 1987 and 1994, Brynjolfsson and Hitt (2003) found that TFP growth is positively correlated with ICT investment, with

³ See IMF (2001).

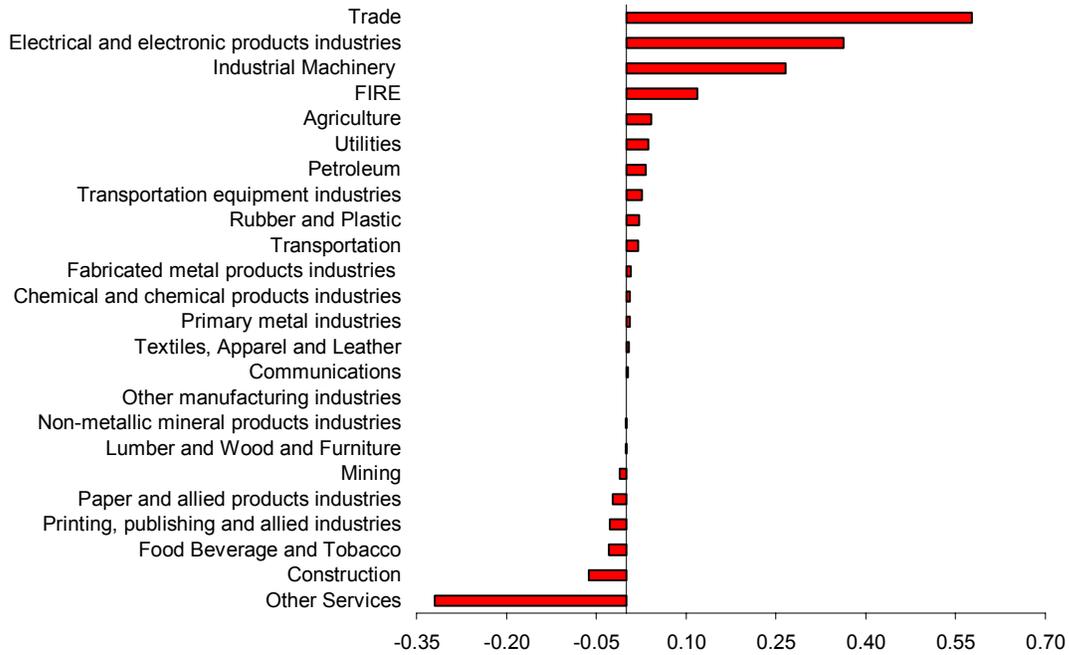
⁴ The Solow residuals are estimated for 23 U.S. industries using several data sources, including the database used by Jorgenson, Ho, and Stiroh (2004) for their study of productivity performance between 1978-2000. The analysis was restricted by the lack of data on capital and value-added by industry after 2001.

⁵ On the other hand, TFP has remained low in the “other services” sector, a composite industry that includes business services, professional and social services, and private health and education. This sector represents about a quarter of aggregate value added, causing a significant drag on total TFP growth between 1995–2000.

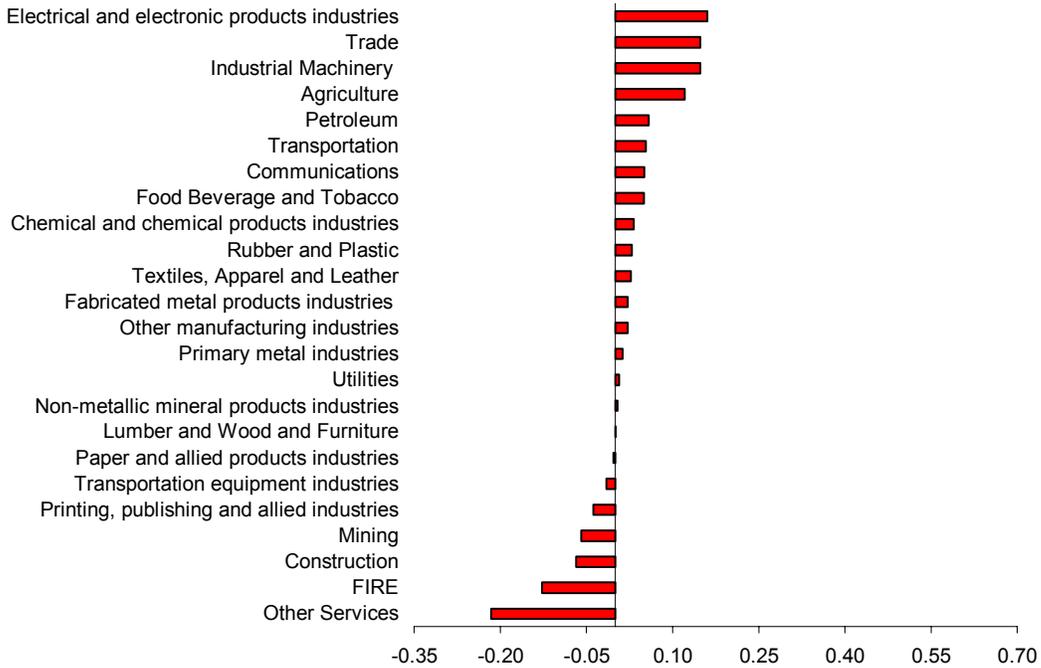
⁶ Measurement difficulties may help explain why several U.S. sectors have lagged in terms of productivity growth despite strong investment in ICT (see Figure 3).

Figure 2. Industry Contributions to Aggregate TFP Growth
(Annual average, in percent)

A. 1995-2000



B. 1978-95

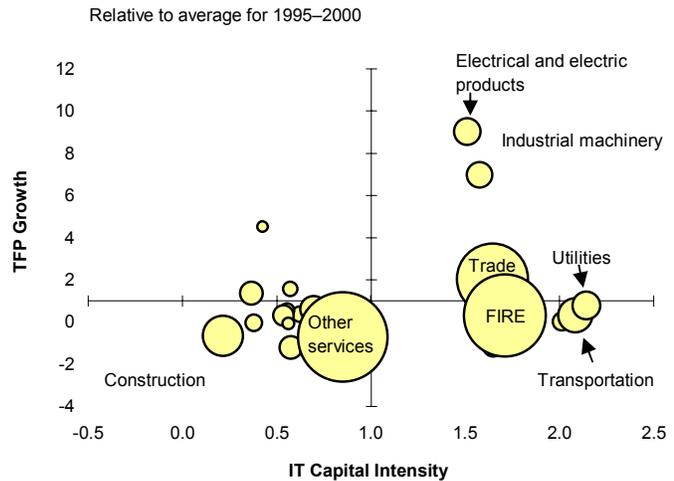


Source: Fund staff calculations.

the full contribution developing over a five- to seven-year horizon.⁷ They interpret this result as an indication that the long-term contribution of ICT to output growth represents the combined effect of ICT and complementary, unmeasured, organizational investment.

- Other studies have emphasized the spillover effects from ICT, such as network economies associated with the use of the Internet, as a source of TFP growth (OECD, 2001). These benefits are long-term in their effect and will continue to develop, even if ICT spending decelerates.

Figure 3. TFP Growth and ICT Capital Intensity¹



Sources: Bureau of Economic Analysis; Jorgenson, Ho, and Stiroh (2004); Fund staff calculations.

¹ Position of axes indicates average. Size of the bubble denotes value added shares. Capital intensity is nominal capital stock (including computer hardware, computer software and telecommunications equipment) divided by sectoral value added.

9. **However, non-ICT factors appear to have also played a significant role, including competitive pressures.** Baily (2004) notes that U.S. companies were forced to innovate and improve production processes by increases in competitive pressures caused in part by the deregulation process that had started in the 1970s and the increased exposure to global competition. Anecdotal evidence and case studies presented by the McKinsey Global Institute (2002) indicate that successful ICT investment has often followed, rather than initiated, important operational changes by U.S. companies, such as the “big box format” in retail trade.⁸ This view suggests that the cutback in ICT spending after 2000 may simply reflect an effort by firms to curb excesses in ICT investment rather than signaling weaker productivity in the future.

10. **These considerations suggest that the boom in U.S. productivity growth may be sustainable.** Although the post-2000 acceleration likely reflects in part cyclical factors, underlying product and process innovations may continue to boost productivity growth rates for the next several years. Gordon (2003b) estimates that the unmeasured investment in intangible capital between 1995 and 2000 subtracted around ½ percentage point a year from

⁷ Brynjolfsson and Hitt (2000) survey evidence on how firms have combined ICT with changes in work practices, strategy, product and services, and customer and supplier relationships.

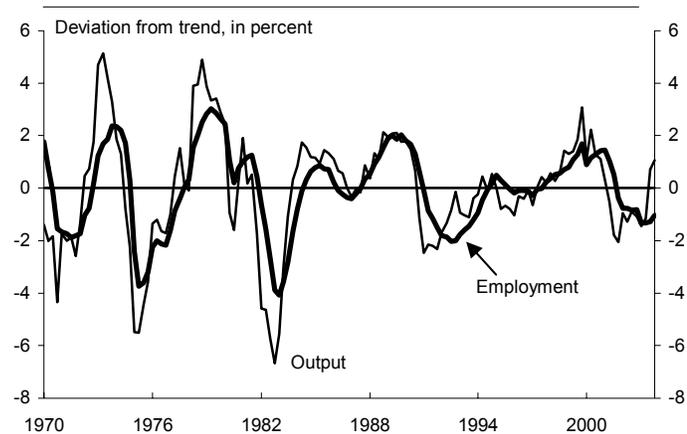
⁸ See also Fernald and Ramnath (2004).

productivity growth, and should boost productivity growth by the same amount thereafter. In addition, important sectors of the U.S. economy have a relatively low ICT capital intensity, particularly the service sector. Catch-up processes in these sectors could yield further productivity gains in the future (Mann, 2003).

B. Technology Shocks, Productivity, and Employment

11. *The unusually weak employment growth during the recent business cycle is often framed as a result of the productivity boom.* Typically, output and labor inputs have tended to move closely together during the U.S. business cycle, with detrended quarterly data since 1948 exhibiting a correlation coefficient in the range of 0.8, regardless of the measure of aggregate output and labor inputs used. However, this strong comovement is less apparent after 2001 (Figure 4).⁹ This has led many analysts to argue that stronger productivity has allowed firms to economize on labor inputs.

Figure 4. Cyclical Behavior of Output and Employment



Sources: Bureau of Economic Analysis; Bureau of Labor Statistics; and Fund staff calculations.

12. *This hypothesis is examined using two approaches:*

- First, technology shocks are extracted using a bivariate vector autoregressive model (VAR) involving labor productivity and employment.
- Second, a five-variable dynamic stochastic general equilibrium (DSGE) model, with output, inflation, nominal interest rates, employment, and real wages, is used to identify the effects of the various shocks that hit the economy.¹⁰

13. *The VAR approach distinguishes between permanent shocks to labor productivity and cyclical shocks with only a temporary impact.* A bivariate VAR with labor productivity and employment was estimated, using the two series in logarithmic first differences and four

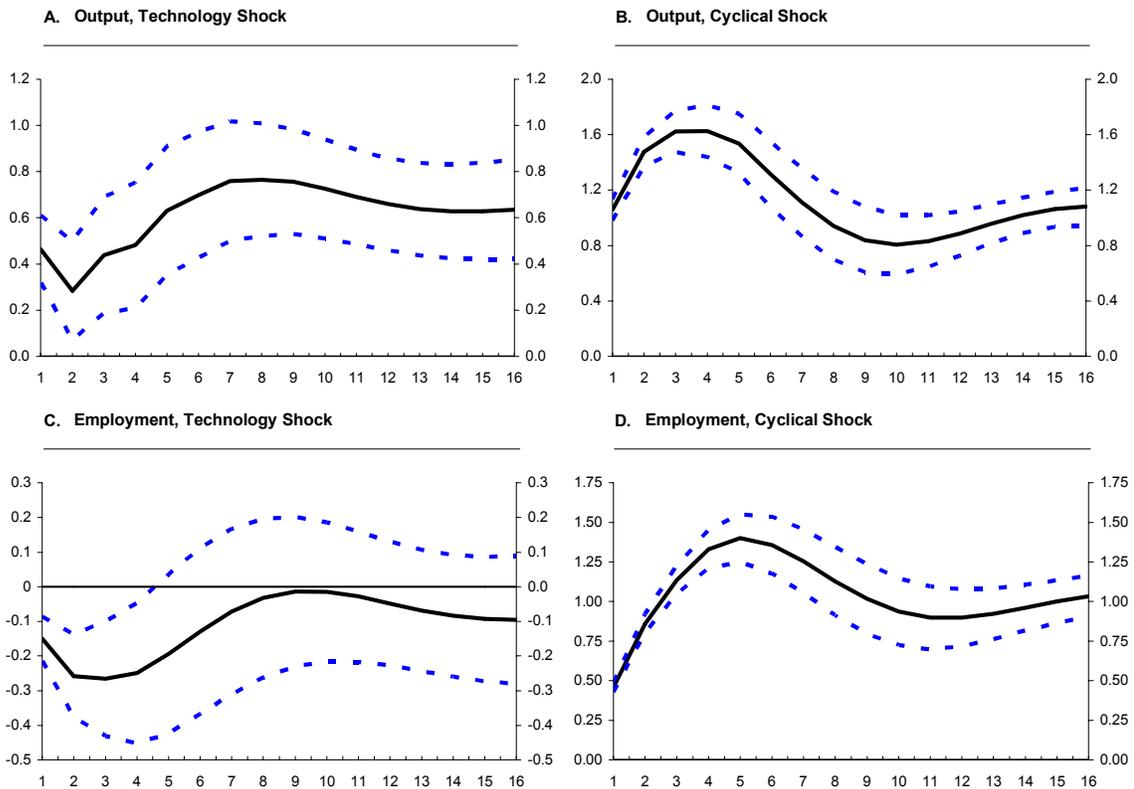
⁹ Job creation has picked up in the first six months of 2004, adding about one million jobs to the work force.

¹⁰ The results of this section are based on the findings in Galí and Rabanal (2004).

lags of each variable. Technology shocks are assumed to have a permanent effect on the level of labor productivity, while cyclical factors are assumed to have only a transitory effect.¹¹

14. *The results suggest that permanent technology shocks may cause significant but temporary employment losses* (Figure 5). A technology shock leads to a short term drop in employment, which returns to around its initial trend after about six quarters. The technology shock leads to a rapid rise in labor productivity, but output rises to its new higher level more gradually as a result of this offsetting effect on employment. The cyclical shock, which increases labor productivity only temporarily, has positive effects on both employment and output.

Figure 5. Quarterly Response of Output and Employment to Technology Shocks
(Deviation from baseline, in percent¹)



Sources: Bureau of Economic Analysis; Bureau of Labor Statistics; Fund staff calculations.

¹ Bands indicate 1 standard deviation range.

¹¹ Using the VAR literature terminology, this amounts to imposing a long-run restriction on the lagged coefficients, as in Blanchard and Quah (1989).

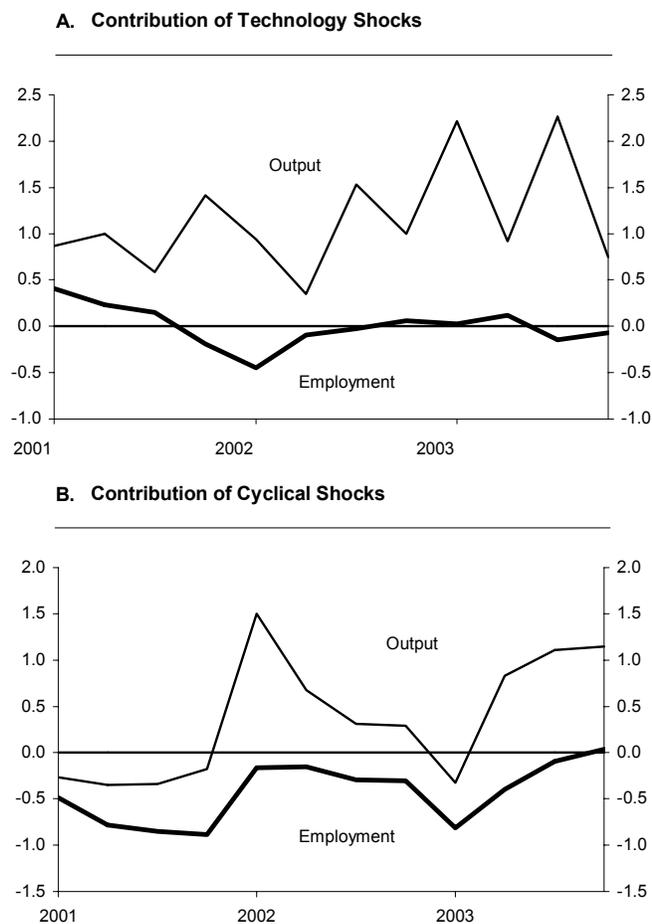
15. *Indeed, the VAR results indicate that recent output and employment losses appear to have been largely cyclical in nature, with technological improvements softening the impact on output growth* (Figure 6). A model-based decomposition of recent output and employment trends suggests that technology shocks contributed to an acceleration of output growth during 2003, but did not affect employment in either a positive or negative way after the first half of 2002. By contrast, cyclical shocks were the main drag on job creation and output growth. In sum, weak but accelerating output growth in 2002–03 was a result of positive technology shocks and negative cyclical factors that led to significant employment losses.

16. *However, the bivariate VAR cannot discern the impact of technology shocks on other macroeconomic variables, such as inflation or unit labor costs.* As a further step, Galí and Rabanal (2004) estimate a five-variable DSGE model, which incorporates several real and nominal rigidities, as well as five shocks: a permanent technology shock, a monetary policy disturbance, as well as demand, price-mark-up, and wage mark-up innovations.¹²

17. *The results of the DSGE model are similar to the VAR* (Figure 7). Shock extraction and model simulations are shown separately for technology shocks and all other shocks

Figure 6. Contributions of Technology and Cyclical Shocks to Output and Employment Growth¹

Quarterly growth rates, in percent



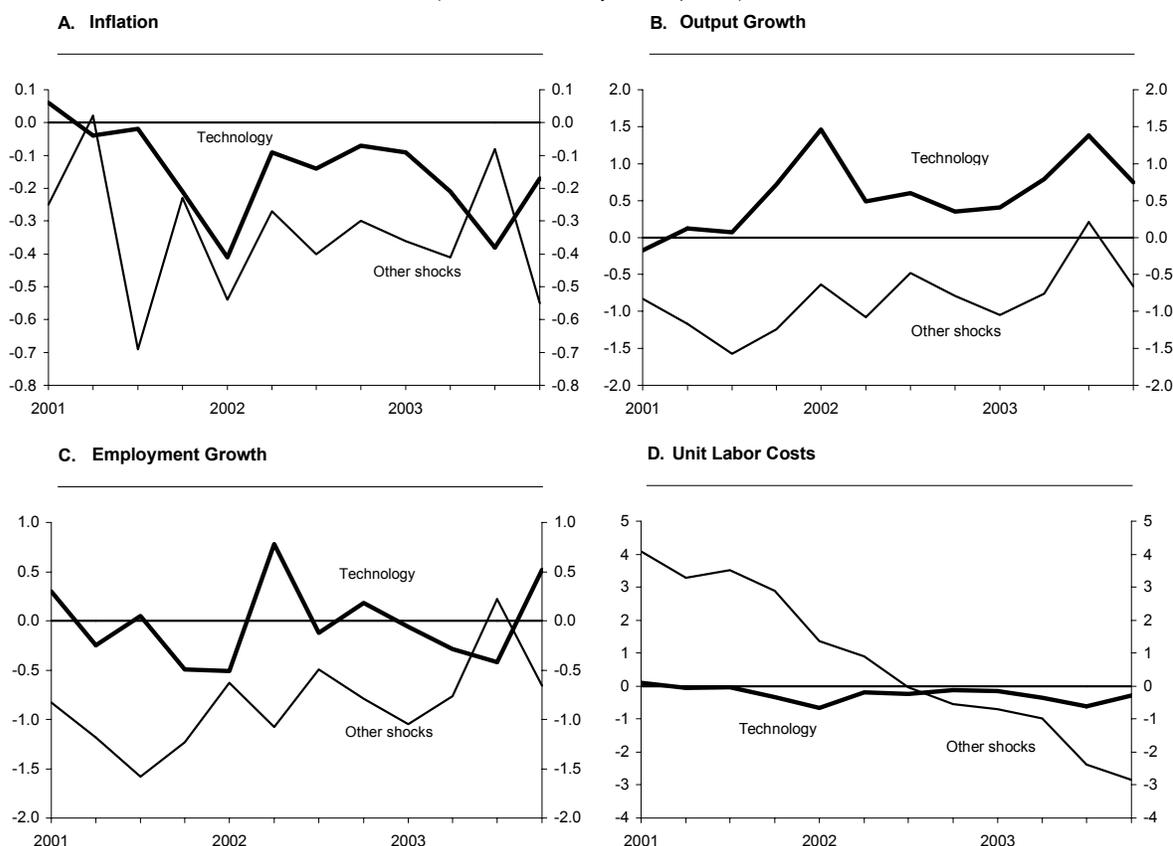
Source: Fund staff calculations.

¹ Decomposition based on the VAR model.

¹² Real and nominal rigidities in the paper include habit formation in consumption, sticky prices and wages, and indexation in price and wage setting. Monetary policy follows a Taylor rule in which interest rates respond to inflation and output growth.

Figure 7. Impact of Technology and Non-Technology Shocks in the DSGE model

(Deviation from steady state, in percent)



Source: Fund staff calculations.

combined (monetary, demand, price, and wage mark up).¹³ Output growth picked up in 2002–03 as a result of technology shocks, overcoming the combined effect of other shocks that would have kept it below trend. By contrast, technology shocks are again found to have had only a small impact on employment fluctuations.

18. ***Technology shocks have contributed to the fall in inflation, but appear not to have been a dominant factor.*** Permanent shocks to productivity lowered the rate of inflation by around ¼ percent after 2002. Demand weakness had much stronger consequences, however, contributing to reduced unit labor costs and inflation. These simulations suggest that acceleration in productivity growth can help reduce inflationary pressures and allow a central bank to be more expansionary than would otherwise be the case, but this effect is modest.

¹³ By construction, all shocks are orthogonal to each other, and the sum of the responses to each shock is equal to the actual values.

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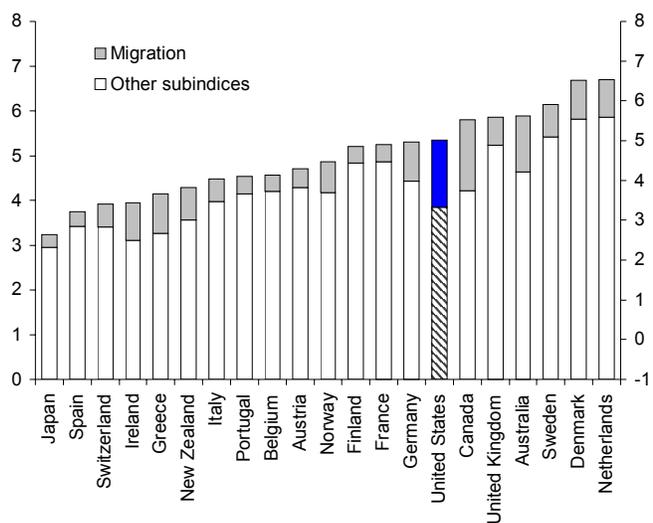
II. DOMESTIC AND GLOBAL PERSPECTIVES OF MIGRATION TO THE UNITED STATES¹⁴

1. **Recent economic developments and policy proposals have focused attention on the macroeconomic and other effects of migration to the United States.** Recent proposals for significant immigration reform include the Administration's plan to launch a new temporary worker program that would give legal status to unauthorized immigrants in the United States (Orrenius, 2003; Meissner, 2004). At the same time, some analysts have related the recent slowdown in the growth of the labor force and the increase in outsourcing of services offshore to a decline in immigration from the high levels of the 1990s, owing both to the weaker economy and security concerns after September 11.

2. **In addition to output growth, immigration trends may have implications for the long-run sustainability of entitlement programs and the U.S. fiscal position.** Higher immigration may at least partly offset the decline in the fertility rate that, together with increases in longevity, is expected to place old age retirement and health care programs under growing financial pressure. Nonetheless, questions still arise whether the net financial impact of immigration on the U.S. government budget is negative or positive. Several studies have concluded that, on average, immigrants and their descendants contribute more in terms of tax revenues than they absorb via higher government outlays. Although the order of magnitude is typically small, the beneficial impact on the federal budget increases with the share of high-skilled immigrants (Storesletten, 2000, and Lee and Miller, 2000).¹⁵

3. **U.S. immigration patterns also have significant effects on the rest of the world.** It is well known that migration can contribute significantly to the economic and social progress of developing countries through a number of channels (Grieco and Hamilton, 2004). While remittances are the most visible link between migrants and their country of origin, the transfer of skills, education and training can also play a large role, despite the risk that source countries can be deprived of their most

Figure 1. Commitment to Development Index



Source: Center for Global Development.

¹⁴ Prepared by Roberto Cardarelli (WHD) and Kenichi Ueda (RES).

¹⁵ Lee and Miller (2000) also find that the costs will be much heavier for states and local areas that receive many incremental immigrants, while states with few immigrants should reap the advantages of reduced federal and social security taxes without bearing the local costs of education and health care for immigrants.

important talent (“brain drain”). Based on the 2004 Commitment to Development Index, compiled for 21 advanced countries by the Center for Global Development, the United States ranks above average mainly as a result of an open policy toward immigration (Figure 1).

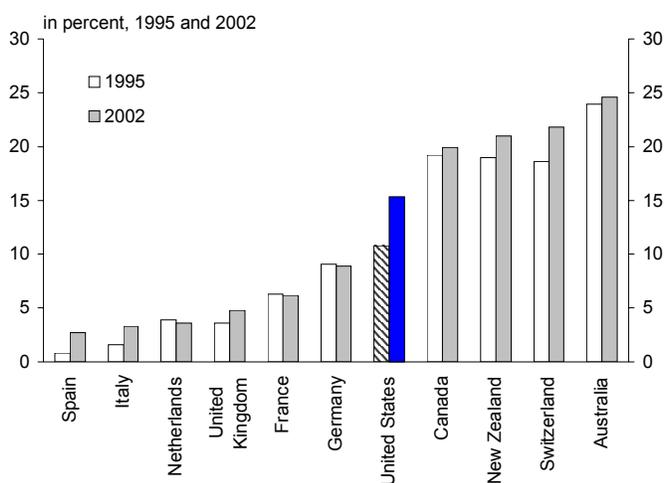
4. ***This chapter seeks to assess the contribution of immigrants to the U.S. economy.*** First, a “direct” contribution is calculated as the value-added produced by foreign-born residents in the United States, amounting to around 10 percent of GDP during 1994–2003. Second, industry-level data is examined to test the extent to which foreign-born workers contribute to U.S. productivity beyond their direct effect on value added. The analysis finds evidence for such indirect contributions in sectors requiring relatively low skill levels.

5. ***In addition, this chapter reviews the impact of migration to the United States on source countries.*** This is done first by considering remittances of U.S. immigrants to their country of origin. In addition, this paper calculates a measure of source countries’ Gross Migration-Corrected Product, taking into account income received by all workers born in a country regardless of current residence. This measure illustrates the significant positive impact that migration to the United States has had on developing countries.

A. Immigrants in the U.S. Labor Market

6. ***Immigrants have contributed strongly to U.S. labor force growth over the past decade.***¹⁶ In 2003, foreign-born persons represented 11 percent of U.S. population, accounting for around 15 percent of the U.S. labor force. Although immigrants represent a larger share of the workforce in a number of other countries—e.g., Australia and Canada—this proportion increased rapidly in the United States between 1995 and 2002. Indeed, foreign-born workers account for half of total U.S. labor force growth during this period (Figure 2).

Figure 2. Immigrant Share of Total Labor Force



Sources: Current Population Survey (CPS); and Fund staff calculations.

¹⁶ Immigration data used in this chapter are from the March Current Population Survey, a multi-stage stratified sampling survey of about 60,000 households which is the source for official government employment statistics. Although the population weights used by the Survey are adjusted to control for undercount, the adjustment is based on the 1990 Census, and thus may not reflect both Census undercount and changes in illegal immigration trends since 1990. Demographers believe that the undocumented population in the United States is currently close to 10 million people (Meissner, 2004).

7. *There are significant differences between skill, education, and other labor market characteristics of immigrants and native-born workers in the United States:*

- **Job characteristics.** Immigrants are over-represented in low-skill jobs; that is, the proportion of foreign-born workers in these jobs is much higher than their overall share in the U.S. labor force (Figure 3a). This concentration largely reflects the strong influx of low-skilled workers from Latin America, with immigrants from other countries being over-represented in occupations that require high and medium skills.
- **Skills distribution.** Education levels of foreign-born workers tend to concentrate at the two extremes of the skills distribution (Figure 3b). Immigrants are over-represented in the “elementary” and “high education without diploma” levels, as well as among workers with “higher education”. Latin American immigrants represent about half of all workers with elementary schooling only. European and Asian immigrants are more heavily represented at the higher education level.
- **Job mismatch.** Foreign-born workers are more likely than domestic workers to hold a lower-skilled job for a given level of education. Around 1.7 percent of highly educated foreign workers (i.e., with BA/BS and higher degrees) work in low-skill occupations, which is more than double the share of native workers.
- **Sectoral distribution.** Foreign-born workers are over-represented in the agriculture, construction and mining, and manufacturing sectors, and under-represented in service sectors (Figure 3c). This picture is somewhat skewed, however, by the concentration of Latin American immigrants in sectors with low skill requirements. Excluding immigrants from Latin America, foreign workers are over-represented in the manufacturing and services sectors, and under-represented in agriculture as well as construction and mining.

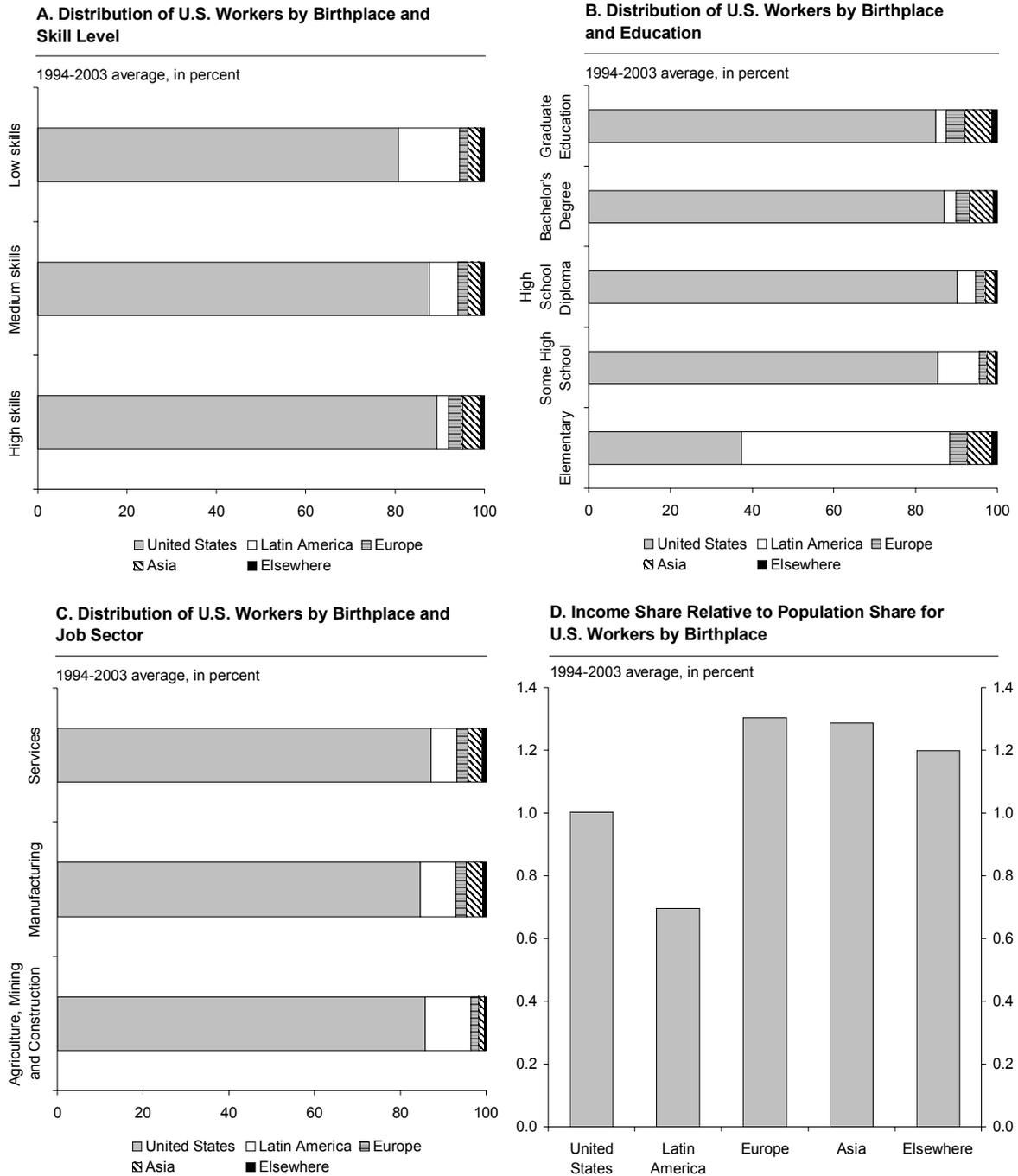
8. *Immigrants’ relative income levels reflect differences in skill and education.*

Between 1994 and 2003 the share of labor income received by immigrants has on average been almost equal to their share in the U.S. population. However, the aggregate result masks a large gap between immigrants from Latin America and those from other countries (Figure 3d). As a result of their concentration in medium- and high-skill jobs, immigrants from Asia and Europe (including Australia, Canada, and New Zealand) have higher per capita-incomes than native workers, while immigrants from Latin America receive about one-third less than workers born in the United States.

B. Recent Immigration Trends

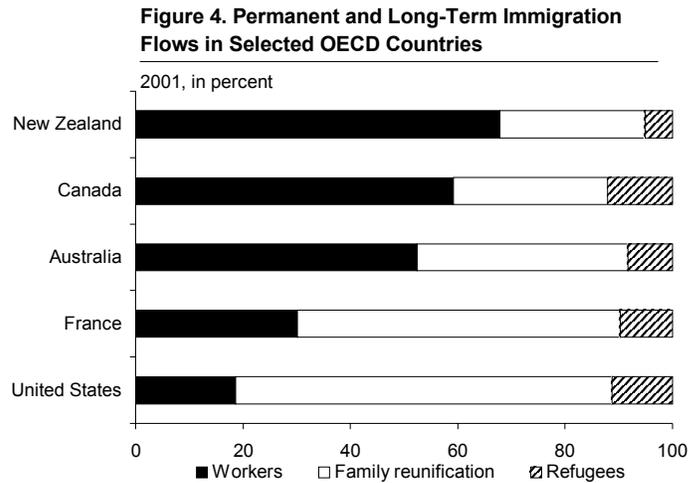
9. *Family-related migration has accounted for the majority of permanent U.S. immigration since the mid-1990s, but temporary labor-related migration is becoming more*

Figure 3. Labor Market Characteristics of Immigrant Workers



Sources: Current Population Survey; and Fund staff calculations.

*important.*¹⁷ Between 1998 and 2001, around 70 percent of permanent immigration occurred by way of family reunion, compared with only 15 percent on the basis of employment. As shown in Figure 4, the employment-based share of permanent immigration into the United States is lower than in other countries, including Australia, Canada, and New Zealand, whose immigration policies are oriented to a



greater degree at meeting skill shortages. However, the bulk of U.S. immigration—roughly two-thirds—is accounted for by temporary immigrants, whose share has more than doubled between 1994 and 2001 (OECD, 2004). Between 1998 and 2001, temporary workers and trainees (including specialty occupations, agricultural workers, professional workers and intercompany transferees) made up about 40 percent of immigrants with time-limited visa status, up from around 30 percent in the mid-1990s.

10. *The rapid increase in temporary immigration has been partly a response to labor supply pressures emerging in the 1990s.* In particular, the annual quota for H-1B visas (which are granted to professional and skilled workers for a maximum of six years) was raised from 65,000 in the mid-1990s to 195,000 over 2000–03, and the 7 percent ceiling on the proportion of visas going to nationals of any given country was lifted.¹⁸ The increase in visas for seasonal workers (both in the agricultural and other programs) over the second half of the 1990s also points to a response to labor shortages in relatively low-skill occupations.

11. *A recent proposal from the U.S. administration aims to increase U.S. reliance on temporary immigrant workers programs* (Meissner, 2004).¹⁹ This contrasts with other

¹⁷ See Doudeijns and Dumont (2003).

¹⁸ For an H-1B visa, the minimum qualification is a bachelor's degree or higher in the worker's specialty skill. The program is most commonly used in the information technology and computer industries. Almost half of those admitted on H-1B visas in the last six to eight years have been from India, with China the next largest source country.

¹⁹ The Fair and Secure Immigration Reform (FSIR) would grant temporary legal status to illegal immigrants working in the United States by releasing 3-year work cards to current undocumented workers who choose to register. They would be allowed to travel freely in and out of the United States, but would have to return to their native country when the permit expires (the permit would be renewable for only one additional 3-year term). Moreover, U.S. employers could advertise jobs on a new internet labor exchange, and if no native worker

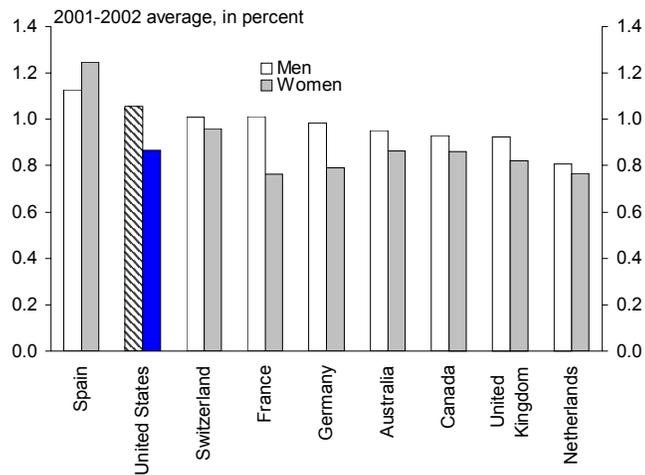
(continued...)

countries, including Australia, Canada, and New Zealand, that have made permanent immigration subject to a point system emphasizing immigrants' "employability" by placing more weight on criteria such as age, education, skills, and work experience.²⁰

12. ***The effectiveness of selective immigration policies is difficult to assess.***

For one, the cost of administering the immigration process rises with the level of detail among the selection criteria (Doudeijns and Dumont, 2003). Moreover, despite the differences in policies, the relative labor force participation of immigrants is higher in the United States than in countries that have based their immigration policies on employment criteria, such as Australia and Canada (Figure 5).

Figure 5. Ratio of Foreign and Native-Born Participation Rates



Source: Organization for Economic Cooperation and Development, 2004.

In addition, the average educational level of immigrants into the United States, excluding immigrants from Latin America, is comparable to that of Canada and Australia (Antecol and others, 2001).

13. ***Population aging and an anticipated shortage of highly-skilled workers are likely to boost the demand for immigrant labor in the future.***

Although population aging is less severe in the United States than in other industrialized countries (the United States is one of the few industrial countries where the working-age population is not expected to decrease in the next 50 years), the U.S. Department of Commerce has warned that the United States is not immune to labor supply shortages, especially at higher skill levels (USDOC, 1997). At the same time, the 2004 *BLS Occupational Handbook* predicts that the U.S. economy will generate jobs for workers of all levels of education and training over the 2002-2012 period. Significant job growth is expected to take place among professional occupations in the IT, health, and education sectors, and half of the 20 fastest-growing jobs would require at least a bachelor or associate degree. However, the largest increase in jobs is expected to be in occupations requiring less formal education and training.

accepted, could go abroad and get guest workers, who would receive three-year renewable visas like those issued to unauthorized workers in the United States. The proposal would also increase immigration limits to accommodate part of the higher demand for temporary immigration visas available for employers who cannot find U.S. workers, currently 140,000 a year for workers and their families.

²⁰ More recently, Germany has introduced a point system based on these models (OECD, 2004).

C. Immigrants' Contribution to U.S. GDP

14. ***In calculating immigrants' contribution to U.S. GDP, it is convenient to assume that immigration does not affect incomes of U.S.-born residents.*** A large body of research has investigated the economic impact of immigration by looking at its effect on wages. Reviewing this literature, Friedberg and Hunt (1995) and Hanson and others (2001) note that, despite the popular belief that immigrants have a large adverse impact on wages and employment opportunities of the native-born population, the empirical support for this conclusion is at best inconclusive.²¹ The lack of a significant impact of immigration on incomes of native residents would suggest that these effects can be largely ignored in measuring immigrants' contribution to GDP.

15. ***A first step is to estimate the value-added produced by foreign-born residents in the United States.*** Such an estimate is obtained by extrapolating from the March Current Population Survey (CPS) the share of total income earned by workers born outside the United States to U.S. GDP.²² This approach indicates that the contribution of immigrants to U.S. GDP has increased steadily from about 10 percent to 13 percent between 1994 and 2003. Indeed, immigrants' contribution to U.S. income is only slightly below their head count representation, a reflection of the small aggregate difference in skills and average income between immigrants and native workers reported in the previous section.

16. ***Income-based estimates, however, might not fully capture immigrants' contribution to GDP.*** Discrepancies could be caused both by the presence of external effects in the production process and by the possibility that immigrants may be paid less than their marginal product. Two types of external effects can be identified. The first is an *intra*-industry effect, with immigration contributing to industry TFP growth by affecting the efficiency of human capital in that sector. The second type of externality caused by immigration is an *inter*-industry effect illustrated by standard Heckscher-Ohlin models of international trade theory. To the extent that they change relative factor endowments,

²¹ In international trade theory, the Rybczynski theorem argues that an increase in the labor-to-capital ratio would lead to a change in a country industry-output mix (towards more labor-intensive goods), rather than to changes in wages and profits. Empirical studies provide some support for this theorem (Borjas, 1987; Card 1990), while other work suggests that immigration may have led at most to a slight decrease in wages of unskilled native workers (Borjas, Freeman, and Katz, 1997; Greenwood, Hunt, and Kohli, 1997).

²² While profits are included in national income, only dividend, interest, and rental income are included in the CPS. Using the survey, therefore, would amount to excluding retained earnings that belong to equity owners. In order to include them into household income, retained earnings are estimated by applying the retained earnings-to-dividend ratio from firm-level data to dividend income in the CPS. U.S. firms' retained earnings-to-dividend ratio is obtained from Worldscope data, a database which provides information on the balance sheet of almost all listed firms in the United States.

migration flows could affect aggregate productivity by inducing changes in a country's industrial structure.²³

17. ***The existence of external effects is examined within an industry-growth accounting framework.*** In particular, the existence of intra-industry external effects is tested by analyzing the relationship between industry-specific productivity, using Solow residuals, and the growth of immigrant labor input for the period 1994-2000. The existence of inter-industry externalities is analyzed by running the same regression at the aggregate level (for the period 1982-2000). The benchmark regression is:

$$SR = \alpha_0 + \alpha_1 \Delta(M) + controls + \varepsilon \quad (1)$$

where SR denotes the Solow residual, Δ log differences, and M immigrants' labor input. The Solow residuals were estimated under standard assumptions, that is, all industries are assumed to have constant returns to scale and all input factors are paid their marginal product, in which case the Solow residuals equal TFP growth.²⁴ As demonstrated in the Appendix, if external effects from immigration were present, the Solow residuals would be affected by the growth in immigrant labor input, and the coefficient α_1 would be different from zero.²⁵

18. ***The results suggest the presence of external effects of immigration particularly in low skill sectors.*** Coefficients are estimated using both a fixed effects model (where industry-specific effects are captured by industry dummies) and a model in first differences (where they are eliminated). In both models, the coefficient on ΔM is significantly positive for agriculture, and the fixed effects model also yields a positive result for the food, beverage, and tobacco sector and the trade sector (Table 1). Overall, the results suggest that externalities may exist in sectors requiring relatively low skills, which attract a relatively large share of immigrant labor, whereas little evidence of externalities is found in sectors that

²³ See Jones (1965) for an analysis. The inter-industry effect is a general equilibrium effect, rather than a pure technological externality. This chapter does not explicitly consider policy-related externalities of immigration, including those related to the impact of immigration on the tax and social security systems.

²⁴ The Solow residual is estimated for 23 U.S. industries, using several industry data sources including the database used by Jorgenson, Ho, and Stiroh (2004) in their latest study on the U.S. productivity performance (see Chapter I of this paper). Labor input from immigrants is derived as the share of total hours worked that can be attributed to immigrants. Being based on the CPS, this estimate is likely to suffer from undercount of illegal immigration (see above). Moreover, the regressions are affected by any measurement error in the estimation of TFP growth. With CPS data on U.S. immigration starting only in 1994, labor input from immigrants for the aggregate specification has been proxied by the growth of Mexican remittances.

²⁵ The set of control variables includes capital services and labor input growth to capture general externalities from labor and capital; year dummies to control for any aggregate shocks; and, in the fixed effect model, the lagged Solow residuals to control for serial correlation, the lagged level of capital and the level of labor.

	Fixed Effects	First Differences
Agriculture	0.71 (3.05)***	0.69 (2.47)**
Mining	0.08 (0.75)	0.04 (0.66)
Construction	-0.19 (1.19)	-0.16 (0.54)
Food, Beverage and Tobacco	0.87 (2.67)**	0.56 (1.30)
Electronics and Machinery	-0.03 (0.07)	-0.29 (0.70)
Communication	0.04 (0.76)	0.01 (0.08)
Trade	0.47 (2.03)**	0.37 (0.72)
FIRE	0.25 (1.02)	0.26 (0.51)
Other services	-0.15 (0.61)	-0.21 (0.37)
Observations	138	115
R-squared	0.79	0.67

¹Independent variable is the Solow residual (see text for details).
Robust t-statistics in brackets.
Note: *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
dM	0.07 (2.33)**	0.08 (2.16)**	0.07 (2.03)*	0.05 (1.56)	0.05 (1.36)	0.05 (1.32)
dL	0.24 (1.60)	0.23 (1.33)	0.23 (1.28)	0.24 (1.35)	0.17 (0.89)	0.19 (0.89)
dK		0.09 (0.59)	0.06 (0.28)		0.26 (1.06)	0.25 (0.93)
L			0.01 (0.26)			-0.04 (0.19)
lagSR				-0.21 (0.78)	-0.26 (0.95)	-0.23 (0.81)
lagK				0.00 (0.45)	-0.01 (0.41)	0.01 (0.13)
Constant	0.00 (0.97)	-0.01 (0.85)	-0.03 (0.35)	-0.02 (0.44)	0.02 (0.32)	0.09 (0.23)
Observations	19	19	19	18	18	18
R-squared	0.48	0.48	0.49	0.35	0.41	0.41

¹ Independent variable is the Solow residual (see text for details). Robust t-statistics in brackets.
Note: *, **, *** indicate significance at the 10 percent, 5 percent, and 1 percent level, respectively.

have attracted relatively high-skilled immigrants. Running the regression at the aggregate level indicates some evidence of external effects for the economy as a whole, with the immigration coefficient significantly different than zero in some of the regressions, depending on the number of controls included (Table 2, previous page).²⁶

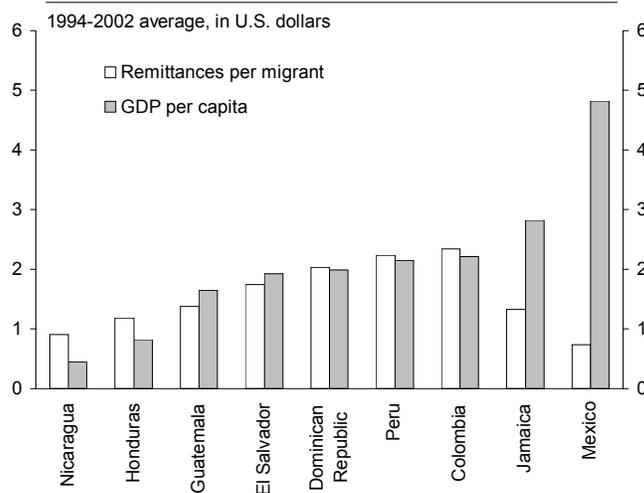
D. An Immigration-Adjusted Measure of National Income

19. *In theory, migration is likely to raise real wages in source countries.* Migration would be expected to raise per capita-income for the remaining residents by reducing labor supply and causing wages to be bid up, with the effect depending on how the changes in labor supply affect the source country's industry mix (see Hanson and others, 2001). However, the effect on overall income would also depend on the impact on human capital in the source country. Migration could have a particularly negative impact on residents' income if migrants were highly skilled relative to the rest of the population (brain drain). However, such a process could also provide current residents with stronger incentives to accumulate human capital (brain gain).²⁷

20. *Data on remittances provide a possibility of measuring a direct monetary benefit for source countries of migration to the United States.*

Immigrants, particularly from developing countries, are known to send a substantial amount of remittances to their families and relatives. Accounting for these transfers would likely increase a source country's welfare above the level indicated by its national accounts. For a variety of reasons, however, remittances are extremely difficult to measure. In particular, official figures fail to capture informal transfers, and thus are likely to underestimate the size of remittances. Estimates of net workers remittances and migrants' capital transfers based on the *IMF Balance of Payment Statistics* show that remittances per U.S. immigrant are above per

Figure 6. Selected Countries: Remittances per Migrant and GDP per Capita



Sources: IMF *Balance of Payment Statistics*; and Fund staff calculations.

²⁶ These results appear consistent with Caselli and Coleman II (2000), who suggest that countries with the most efficient use of skilled labor and capital—e.g., the United States—also tend to make the least efficient use of unskilled labor.

²⁷ See Beine and others (2002), and Carrington and Detragiache (1998).

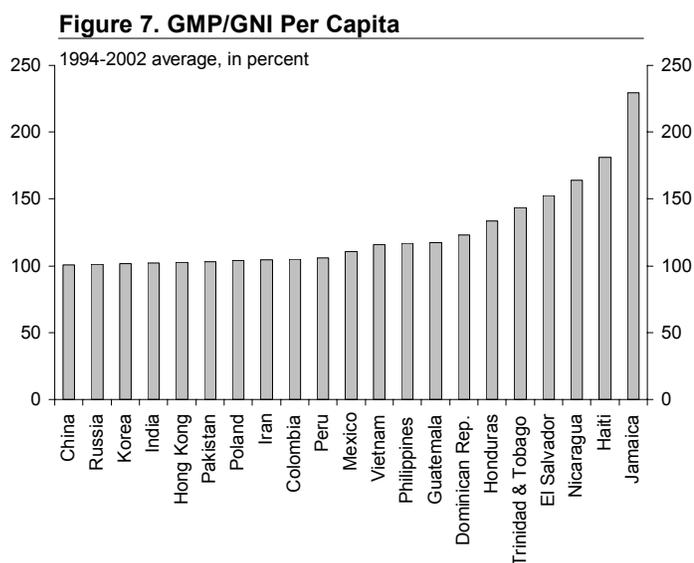
capita GDP for several Latin American countries, compared to only around 15 percent of per capita GDP for Mexico (Figure 6, previous page).²⁸ However, the result for Mexico may be an underestimate, given that one in every two Mexican immigrants may be undocumented, according to the March 2002 Current Population Survey as well as census data. A higher share of undocumented immigrants could imply that a larger share of remittances to Mexico may flow through informal channels and thus be more difficult to measure.

21. *A different way of capturing the benefit from migration to the United States consists in adding immigrants' income to the country-of-origin Gross National Income (GNI).* This is equivalent to measuring national income on the basis of country-of-origin rather than residency (Ueda, 2002). In the case of Mexico, for example, a nominal "Gross Migration-Adjusted Product" (GMP) can be calculated by summing the income of Mexican migrants to the United States, derived from the CPS, to Mexico's GNI adjusted for remittances and differences in cost of living:

$$MexNomGMP = \frac{(MexGNI + Ex * REM)}{PPPEx} + (MexIncomeinUS - REM) \quad (2)$$

where *REM* stands for remittances, *Ex* for the US/Mexican Peso exchange rate, and *PPPEx* for the purchasing power parity-adjusted exchange rate. Nominal GMP is converted into real U.S. dollars using the U.S. GDP deflator.

22. *GMP calculations for a range of countries show that immigration to the United States has provided significant benefits to a large set of developing countries over the last decade.*²⁹ Mexico's real GMP has been an average 11 percent higher than real GNI



Sources: CPS; and Fund staff calculations.

²⁸ Data on remittances are from all destinations, not only the United States. To reduce the extent of the bias the figure is limited only to Latin American countries, for which remittances from the United States are more likely to account for a vast majority of the total. Indeed, estimates of remittances from the United States recently released by the Inter-American Development Bank (IDB, 2004) are not very different from aggregate data on remittances for Latin American countries for 2003.

²⁹ As is the case for Mexico, the GMP estimates presented here are only based on income from migrants to the United States, which probably captures the bulk of migrants' income for Latin American countries but only a portion of the total figure for other countries.

between 1994 and 2002 (Figure 7). Real GMP grew at an annual 4¼ percent on average over this period, compared to average GNI growth of 2½ percent. The results also show that citizens of Latin American countries have benefited the most from migration to the United States as the GMP/GNI ratio is quite large for many of these countries, especially from Central America.³⁰ For other geographical regions, similarly large differences are found only for Philippines and Vietnam. By contrast, migration-related benefits for India and China appear almost negligible, despite the large number of U.S. immigrants originating from these countries.

E. Conclusion

23. ***Immigration flows appear to have contributed greatly to the growth of the U.S. labor force, even if only a small share of legal permanent entry is labor-related.*** Data on education, skills, industry concentration and income reveal a highly polarized composition of migration flows, with migration from Latin America concentrated in low education and low skill occupations and migrants from elsewhere tending to have relatively high levels of education.

24. ***Immigrants have accounted for about one-tenth of U.S. income growth in recent years.*** Their contribution to U.S. growth could possibly be even higher, owing to the presence of positive spillovers especially in sectors requiring low skills that have a relatively high presence of foreign-born workers.

25. ***Both remittances data and an immigration-adjusted measure of source country-income indicate that migration to the United States has had a significantly positive effect for a range of developing countries.*** Despite the difficulties in capturing transfers from immigrants to their country of origin, remittances per immigrant in the United States are above GDP per capita for several Latin American countries. Adding back income earned by foreign workers in the United States to their source country's gross national income confirms that citizens of a large set of developing countries have benefited from migration opportunities to the United States in recent years.

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³⁰ Owing to lack of data, GDP rather than GNI is used for China, Colombia, Haiti, Peru, Poland, Russia, and Trinidad and Tobago.

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The Standard Solow Residual

The production function can be represented as:

$$Y = A(t)f[K(t), L(t)] \quad (\text{A.1})$$

where Y is value added, A denotes total factor productivity (TFP), K represents capital services, and L represents labor input. Taking time derivatives, this can be written as

$$\tilde{Y} = \frac{Af_K K}{Y} \tilde{K} + \frac{Af_L L}{Y} \tilde{L} + \tilde{A} \quad (\text{A.2})$$

where a tilde denotes the proportional growth rate:

$$\tilde{X} = \frac{\partial X(t) / \partial t}{X} \quad (\text{A.3})$$

Assuming that the production function is based on a constant-returns-to-scale (CRS) technology and that factors of production receive the marginal product of labor, the value-added Y is entirely paid to labor under wages and salaries, and to capital as return on investments. Hence, the labor share of value added is

$$\frac{Af_L L}{Y} = \frac{wL}{Y} \quad (\text{A.4})$$

and the capital share is

$$\frac{Af_K K}{Y} = \frac{(Y - wL)}{Y} \quad (\text{A.5})$$

Denoting with $(1-\alpha)$ the labor share of income, the Solow residual (SR) coincides with TFP growth:

$$SR = \tilde{Y} - \alpha \tilde{K} - (1 - \alpha) \tilde{L} = \tilde{A} \quad (\text{A.6})$$

One digression from the standard assumptions is that there are externalities from immigrants' labor, M . This case can be represented through a production function like the following:

$$Y = A[t, M(t)]f[K(t), L(t)] \quad (\text{A.7})$$

Taking time derivatives, this can be written as

$$\tilde{Y} = \frac{Af_K K}{Y} \tilde{K} + \frac{Af_L L}{Y} \tilde{L} + \frac{A_M fM}{Y} \tilde{M} + \tilde{A} \quad (\text{A.8})$$

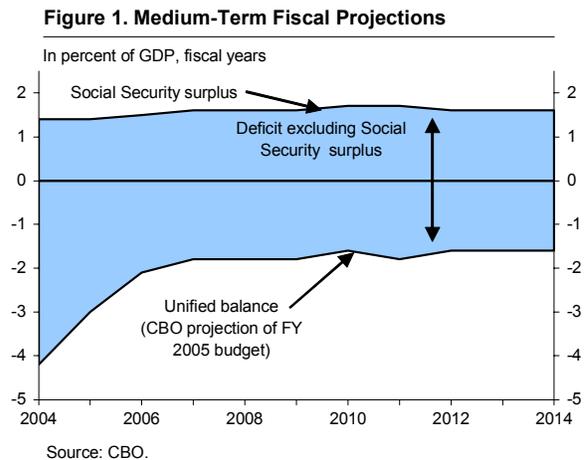
Assuming that both capital and labor receive their marginal products, the SR can be expressed as TFP growth plus a factor proportional to immigrants' labor growth:

$$SR = \frac{A_M fM}{Y} \tilde{M} + \tilde{A} = \frac{A_M}{A/M} \tilde{M} + \tilde{A} = \eta \tilde{M} + \tilde{A} \quad (\text{A.9})$$

Assuming that η —the elasticity of the external effect—is constant, the SR is affected by growth in immigrants' labor inputs as well as TFP growth.

III. UNITED STATES: PERSPECTIVES ON FISCAL CONSOLIDATION³¹

1. ***The administration has committed itself to reducing the fiscal deficit to below 2 percent of GDP by the end of the decade.***³² Following a substantial widening in recent years, this would bring the budget deficit below its long-term average relative to the size of the economy, but fall short of the administration's initial objective of maintaining an overall surplus equal to that of the Social Security trust funds (OMB, 2001; Figure 1). Moreover, as a number of analysts have noted, the adjustment relies heavily on the effect of the cyclical rebound, the expiration of some of the recent tax cuts, and adherence to strict spending limits, with the deficit reduction after FY 2006 being relatively modest.



2. ***Even if current budget targets were achieved, both the federal deficit and debt would remain high relative to the pressure on entitlement programs from the retirement of the baby boomers.*** As has been illustrated in recent staff analyses, more ambitious deficit reduction would have the advantage of providing greater room for addressing the underfunded position of entitlement programs, which experience suggests could require a long time to be fully implemented (Mühleisen and Towe, 2004).³³

3. ***Most analysts agree that significant efforts would be required to reduce the deficit further.*** For example, a review of three different plans for fiscal consolidation contained in Rivlin and Sawhill (2004) suggests that expenditure cuts and revenue measures worth a combined \$530 billion (3½ percent of GDP) per year could balance the unified federal budget over the next ten years. Edwards (2004a) proposes \$300 billion (2½ percent of GDP) worth of annual expenditure savings to achieve the same target over five years. Balancing the budget excluding the Social Security surplus, which has been the IMF staff's long-standing prescription, would require fiscal measures of up to 4 percent of GDP by the end of the decade.³⁴

³¹ Prepared by Martin Mühleisen and Andrew Swiston.

³² The fiscal year runs from October 1 to September 30.

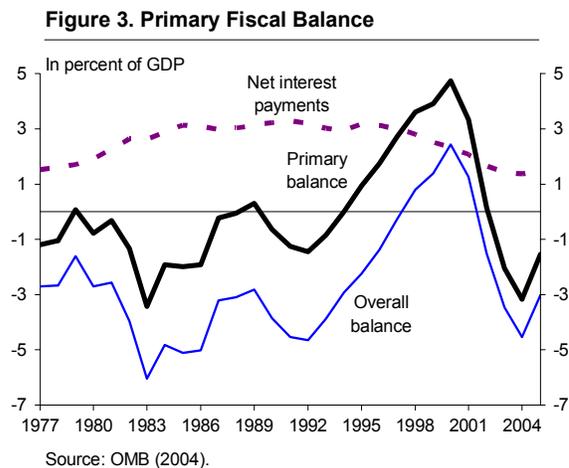
³³ In 1983, Congress enacted pension reform measures, including a gradual increase from 65 to 67 in the full retirement age that is being phased in through 2022.

³⁴ Less adjustment would be needed if the economy grew stronger than expected, with the deficit falling an estimated 1½ percent of GDP for each ½ percentage point increase in the potential growth rate.

4. *Against this background, this chapter reviews possible policy options for fiscal consolidation.* As an introduction to the discussion, Section A draws parallels with consolidation in the 1990s, suggesting that current circumstances may be more difficult. Section B reviews the potential for spending cuts, while Section C discusses tax base-broadening and other measures to boost revenues. Section D review options that could be considered for generating short-term savings in the Social Security and Medicare programs.³⁵

A. Lessons From the Last Fiscal Cycle

5. *There are a number of important parallels between the current fiscal cycle and the expansion that occurred during the 1980s.* In the earlier period, priority was given to boosting military spending, cutting taxes to strengthen the supply side of the economy, and stimulating activity in response to the 1981–82 recession. As a result, the fiscal deficit widened by 4½ percent of GDP between FY 1979 and FY 1983, reaching a peacetime low of 6 percent of GDP (Figure 2, next page). Similar priorities have caused an even larger shift in the budget balance in recent years, totaling 7 percent of GDP between FY 2000 and FY 2004.³⁶ Although the overall deficit has not reached the same level as during the 1980s, the primary balance (i.e., excluding interest payments) has declined to a comparable level (Figure 3).

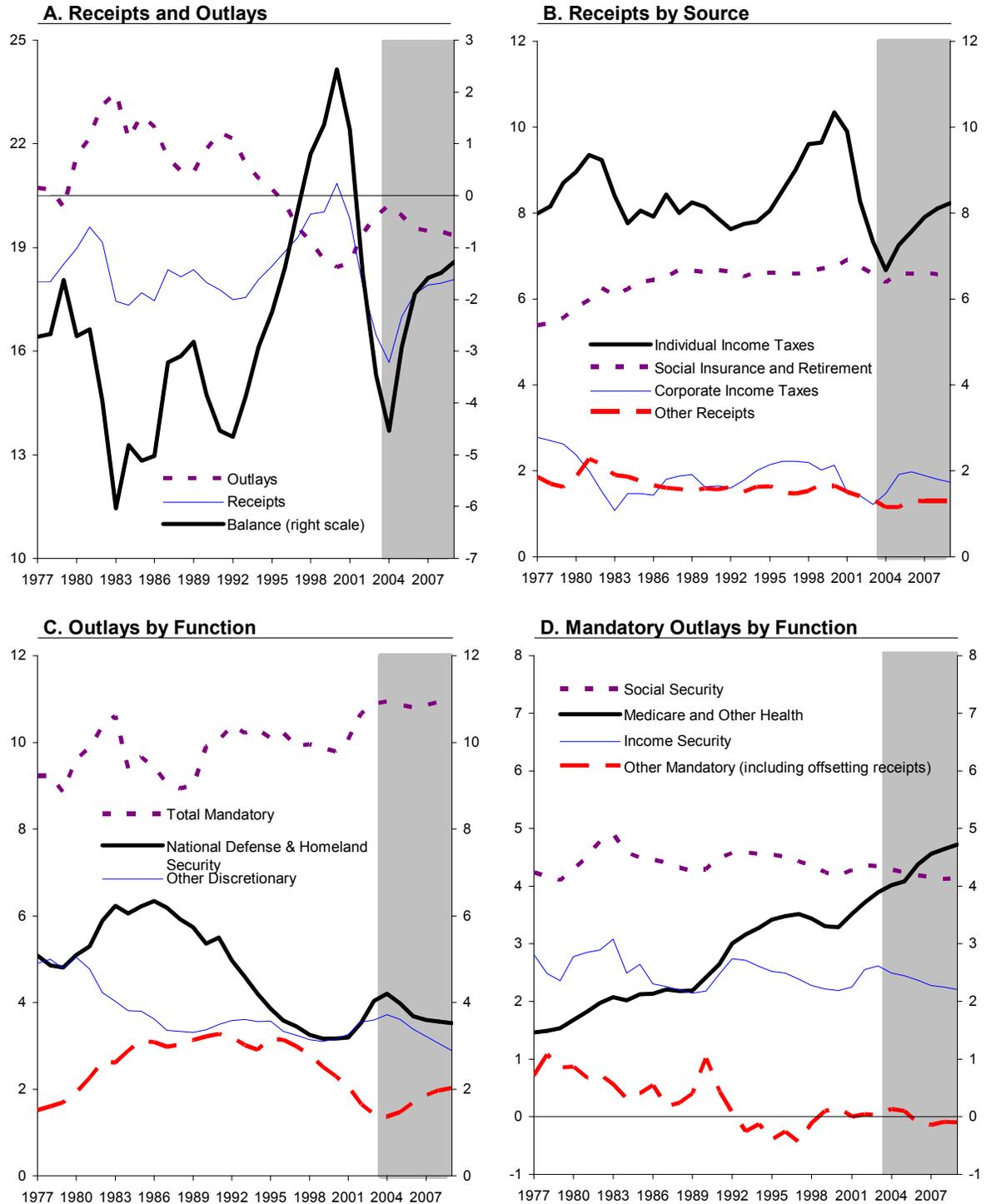


6. *The two episodes differ in important ways, however, with the fiscal expansion in the 1980s primarily caused by higher spending.* Federal expenditures rose by 3½ percent of GDP between 1979 and 1983, most of which resulted from an increase in entitlement spending (Figures 4 and 5). While defense expenditure also increased, this was partly offset

³⁵ This paper only discusses fiscal measures needed to return the budget to balance over the medium-term. Measures to restore long-run budget sustainability, including offsets for the rising cost of entitlement spending, have recently been estimated to amount to some 7–10 percent of GDP (Gokhale and Smetters, 2003; Auerbach, Gale, and Orszag, 2004).

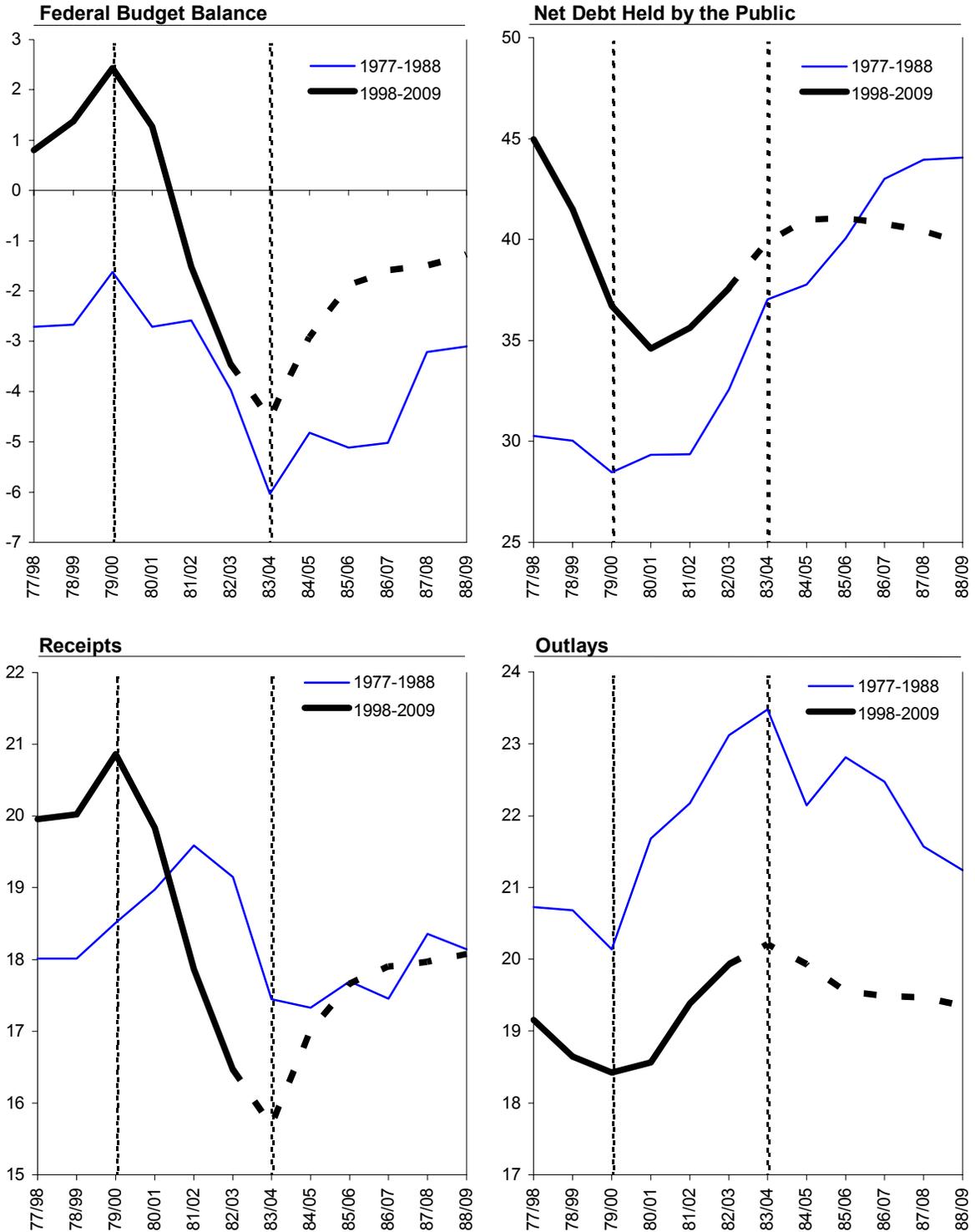
³⁶ Up to one-half of the increase in the post-2000 deficit was the result of economic factors, however, with the loss of bubble-induced capital gains revenues having no parallels in the 1980s (Gale and Orszag, 2004; Mühleisen and Towe, 2004).

Figure 2. Receipts and Outlays of the Federal Government, 1977 - 2009
(In percent of GDP)



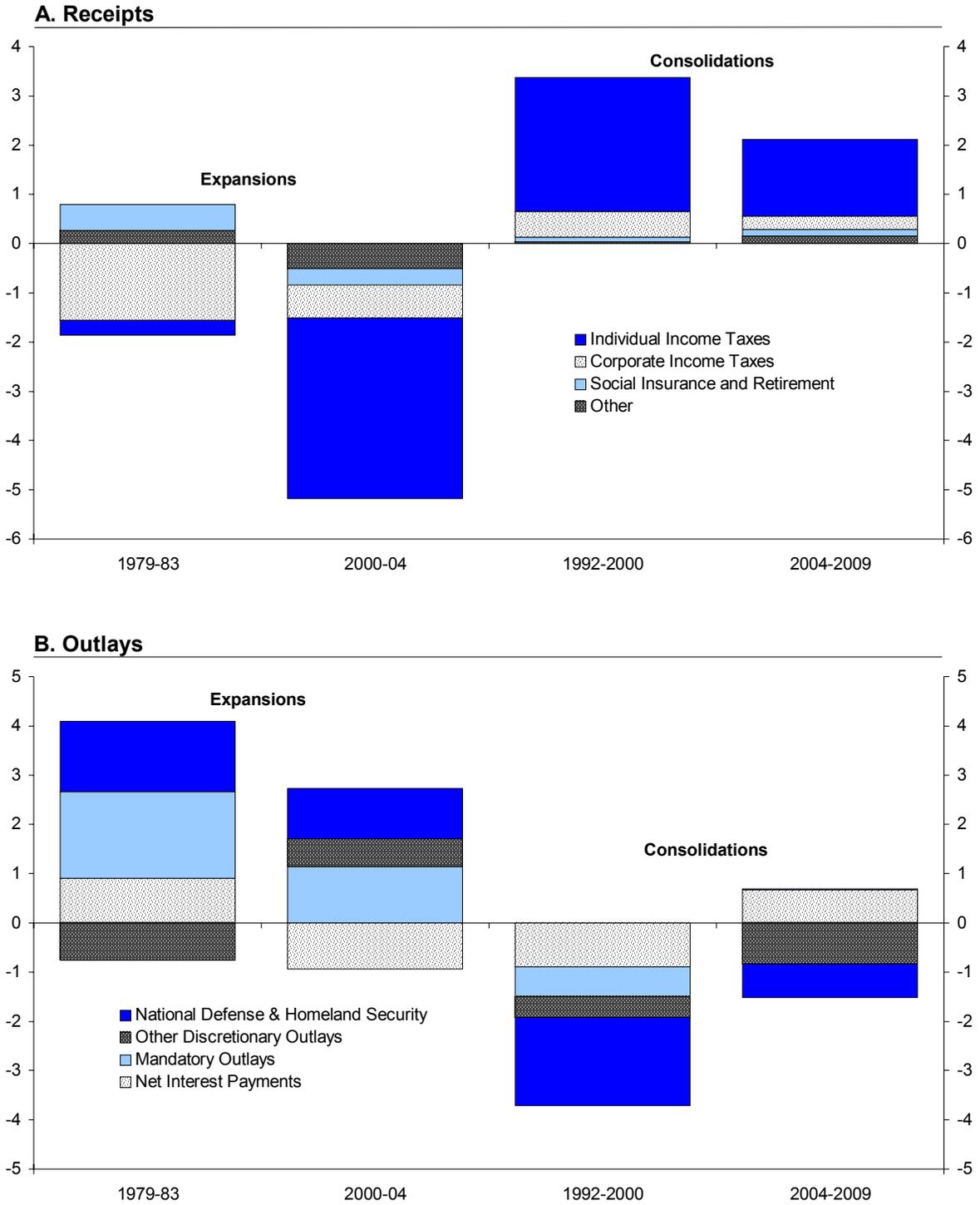
Source: OMB (2004).

Figure 4. Comparison of Fiscal Position, 1977-88 and 1998-2009
(In percent of GDP)



Source: OMB (2004).

Figure 5. Change in Federal Receipts and Outlays, 1979 - 2009
(In percent of GDP)



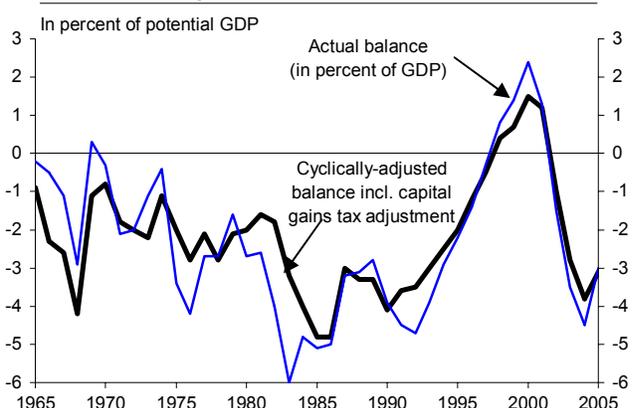
Source: OMB (2004); and Fund staff calculations.

by cutbacks in other discretionary spending categories.³⁷ Altogether, outlays accounted for almost three-quarters of the deficit increase in the early 1980s, compared to less than a third in the recent fiscal expansion.

7. ***The revenue effect of the “Reagan tax cuts” was considerably smaller than in the current period.*** Among other measures, the Economic Recovery Tax Act (ERTA) of 1981 lowered marginal income tax rates by around one quarter across the board—contributing to a 2½ percent of GDP drop in personal income tax revenues over two years—and accelerated depreciation schedules, providing significant corporate tax relief. Although the short-term revenue loss caused by ERTA exceeded those in recent years, parts of this tax cut were quickly reversed as the fiscal position deteriorated in subsequent years (Penner, 2003; Steuerle, 2004; Tempalski, 2003).³⁸ Personal income tax revenues therefore changed relatively little during the expansion in the early 1980s as a share of GDP, although corporate tax revenues declined by 1½ percent of GDP. By contrast, the more recent tax cuts have been largely targeted at households, with personal income tax revenues expected to fall by more than 3 percent of GDP between FY 2000 and FY 2004.

8. ***The fiscal position proved difficult to correct during the 1980s, despite strong economic growth.*** Federal revenues remained stable relative to GDP throughout the decade, owing to the economy expanding 4 percent on average between 1983 and 1989, and a series of legislated tax increases. Non-military discretionary spending cuts were sustained, and defense expenditure began to decline in the second half of the decade. Nevertheless, the deficit dipped only briefly below 3 percent of GDP in 1989, before being pushed up again by the 1991 recession, the costs of dealing with the S&L crisis, and the Gulf war. In structural terms, the deficit fell by around 1 percent of GDP during the late 1980s (Figure 6).

Figure 6. Budget Balance Adjusted for Cyclical Factors and Capital Gains Taxes¹



Source: CBO.

1/ The CBO's cyclically-adjusted balance has been altered by subtracting the difference between capital gains tax revenues and their long-term historical average.

³⁷ Nondefense discretionary spending declined by 13½ percent during FY 1981–84, compared to an increase of over 20 percent between FY 2001–04 (de Rugy and DeHaven, 2003). Discretionary spending is controlled by annual appropriations acts. Mandatory spending is provided by permanent law and does not require annual appropriations to ensure the continuation of spending.

³⁸ The 1986 Tax Reform Act included a further reduction in marginal income tax rates, but its revenue impact was broadly neutral as a result of base broadening measures (Tempalski, 2003)

9. ***It took tax hikes, a sharp contraction in military spending, and an unprecedented economic expansion to achieve fiscal consolidation.*** The fiscal improvement between 1992 and 2000 amounted to about 4½ percent of GDP in structural terms, leaving the budget in surplus even after excluding Social Security. Contributions from the revenue and expenditure side were about equal:

- Individual income tax receipts rose by 2¾ percent of GDP, propelled by an increase in top marginal tax rates in the 1993 Omnibus Budget Reconciliation Act, strong income growth especially in the higher tax brackets, and a booming stock market.
- Defense spending was roughly cut in half as a share of GDP from its peak during the 1980s and the end of the 1990s, accounting for the bulk of expenditure reduction. Nondefense discretionary outlays were also contained, owing in large part to the spending caps imposed by the 1990 Budget Enforcement Act. Mandatory outlays even fell somewhat, benefiting from a temporary drop in fertility rates during the Great Depression that affected the number of retirees 60 years later (Penner, 2003). Finally, a decline in interest rates and the shrinking public debt ratios caused net interest payments to drop by almost 1 percent of GDP.

10. ***Present circumstances appear less favorable for fiscal consolidation.*** On the revenue side, the extension of the 2001 tax cuts, if enacted, would permanently lower tax receipts by about 2 percent of GDP. Moreover, with lower top marginal income tax rates and reductions in capital gains taxes, revenues would be less well positioned to benefit from economic buoyancy than in the 1990s should the economy exhibit a similar distribution of income gains in the coming years. Budget forecasts are also predicated on the Alternative Minimum Tax (AMT) being maintained in its present form, which is viewed as unlikely since the AMT will affect an increasing number of middle-class taxpayers over the coming years.³⁹

11. ***On the expenditure side, many of the factors supporting fiscal consolidation in the 1990s are also no longer in place.*** Expenditure on defense and homeland security has increased after 2001, but remains far below the levels reached in the 1980s. Geopolitical uncertainties and security concerns are likely to persist over the foreseeable future, suggesting that large-scale reductions in this category are unlikely to materialize. Keeping a lid on mandatory spending also would appear more difficult as the retirement of the baby boomers is now imminent; and interest costs are projected to rise as the downward cycle in interest rates may have finally come to an end.

³⁹ See Chapter IV in this paper. Some analysts expect AMT revenues to defray the costs of about one third of recent tax cuts (Burman et al., 2003).

B. Containing Public Expenditure

12. ***The FY 2005 budget lays considerable emphasis on reversing recent increases in federal spending.*** Federal outlays have picked up since the late 1990s, reflecting weakening budget discipline in the face of strong revenue gains (de Ruyg, 2004; Kell, 2004) and, more recently, the reaction to geopolitical developments. Outside defense and homeland security, spending rose mainly in entitlement programs, reflecting initiatives such as the No Child Left Behind Act for education and the introduction of a new prescription drug benefit for the Medicare program. The recent budget proposes to stiffen expenditure discipline considerably over the next five years. While spending on defense would be reduced to 3¼ percent of GDP, other discretionary outlays would drop to 3 percent of GDP by FY 2009, equivalent to a 2 percent per year decline in real terms (Table 1).

13. ***This adjustment would further reduce government outlays from a level that is already low by international standards*** (Figure 7, next page). In comparison with other major industrial countries, U.S. non-military public expenditure and employment are low relative to the size of the economy. Excluding defense spending, which is much higher in the United States, U.S.

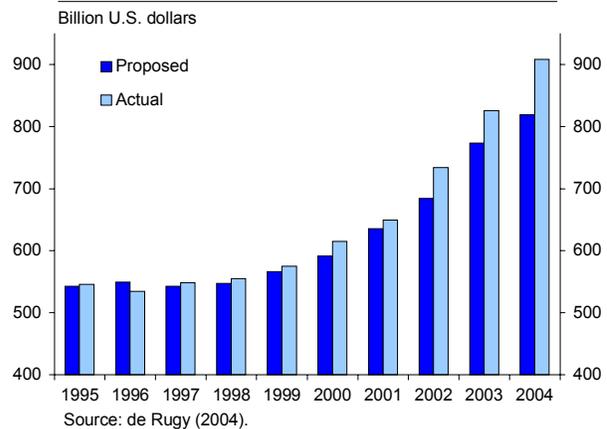
government spending is about 10 percent of GDP below the G-7 average. While comparisons are also complicated by differences in the degree to which health spending and other public transfers affect public expenditure data, this suggests that the U.S. government sector is already relatively lean, which may make it difficult to identify expenditure savings of a large order of magnitude. Some analysts have also argued that genuine spending needs remain unfilled, for example, based on studies that suggest maintaining public infrastructure levels is necessary to underpin long-term growth prospects.⁴⁰

14. ***Imposing spending discipline may be difficult in the absence of a robust medium-term expenditure framework.*** Congressional appropriations have typically exceeded initial budget proposals (Figure 8),

	Discretionary Outlays		Mandatory Outlays
	Defense	Other	
	<i>(in billions of U.S. dollars)</i>		
FY 2004	452	457	1,314
FY 2009	486	457	1,692
	<i>(in percent of GDP)</i>		
FY 2004	3.9	4.0	11.5
FY 2009	3.3	3.1	11.5

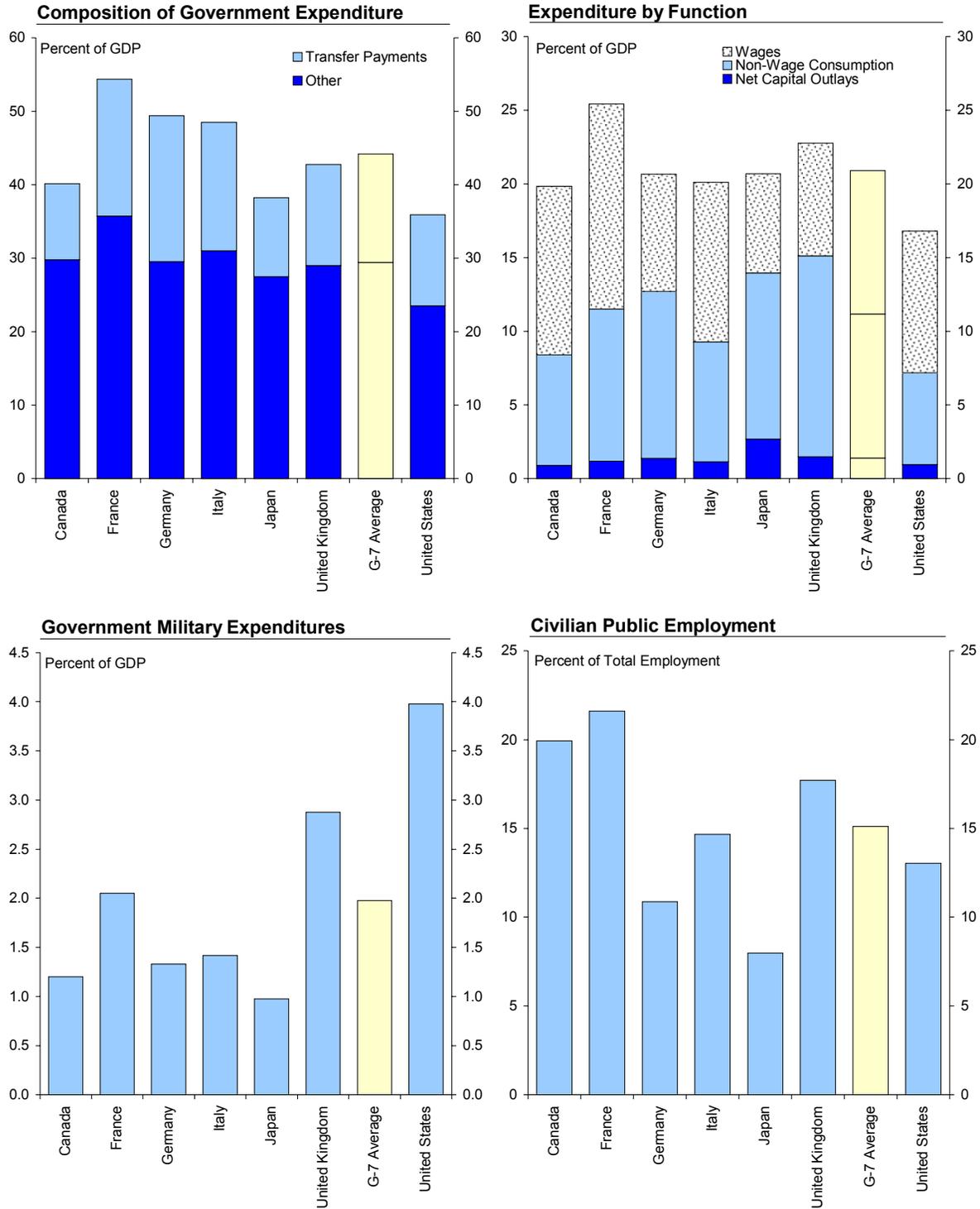
Source: OMB (2004).

Figure 8. Discretionary Outlays Proposed by the President vs. Actual Outlays



⁴⁰ Yeaple and Golub (2004) found evidence that the provision of public infrastructure is associated with total factor productivity differences across countries. For the United States, Zegeye (2000) finds a small but positive impact of public infrastructure on output and productivity at the state and county level.

Figure 7. G-7 Countries: Government Expenditure and Employment, 2003



Source: IMF, *World Economic Outlook*; and OECD.

which has been ascribed to efforts by members of Congress to secure federal spending for their constituencies (CAGW, 2004). In recent years, this trend appears to have increased (de Rugy, 2004), and prospects are uncertain for agreement on a FY 2005 budget resolution and a full set of appropriations bills. This could again necessitate spending authorizations through an omnibus spending bill, which in the past has resulted in an easing of fiscal discipline in order to secure passage.

15. ***Expenditure discipline could be strengthened by reinstating budget control mechanisms similar to those contained in the Budget Enforcement Act (BEA) that expired in 2002.*** Some of these were included in the Spending Control Act proposed by the administration, which would have required offsets for budget proposals increasing long-term unfunded liabilities and limited the scope for “emergency” legislation and other instruments used to circumvent the BEA in the late 1990s.⁴¹ Congress recently rejected this proposal, however, with some members expressing concern that it would have largely exempted tax cuts from mandatory offsets under pay-as-you-go (PAYGO) rules and reduced the period for scoring the budgetary impact of policy proposals from ten to five years. The administration was also seeking legislation to restore the “line-item veto”, which would provide the President with the authority to reject new individual appropriations, mandatory spending proposals, as well as a limited range of tax cuts.

16. ***While the budget would reduce nondefense spending by about \$30 billion relative to “current services” estimates, considerably larger cuts can be envisaged.*** Rivlin and Sawhill (2004) identify a range of measures worth \$68 billion (½ percent of GDP) that could help improve the quality of government spending without affecting major spending priorities (Table 2). These include cutbacks in agricultural, commercial, and trade subsidies, as well as reductions in other low-value government spending. Silvinski (2001) and Edwards (2004a) provide more far-reaching suggestions for terminating, privatizing, or devolving to states a wide range of federal programs, amounting to total savings of \$300 billion (2½ percent of GDP) per year. While agencies such as the Army Corps of Engineers, the FAA, and others would be privatized, the bulk of savings would be achieved by eliminating the Departments of Education and Housing and Urban Development (Table 3). However, even the more limited measures proposed by the administration have raised concerns over their legislative viability (Greenstein and Kogan, 2004) and distributional impact (e.g., Steuerle, 2003).

Category of spending cuts	Annual saving by 2014 (\$ bn)
Subsidies	23
<i>of which:</i> Agriculture	11
State and local grants	17
<i>of which:</i> Convert categorical grants into block grants	7
Low-value investment	20
<i>of which:</i> Manned space flight	9
Improved efficiency, fraud reduction	8
Total	68

Source: Rivlin and Sawhill (2004).

⁴¹ See Kell (2004) for a discussion of the BEA’s effectiveness in curbing expenditures in the 1990s.

Table 3. A Proposal for Federal Expenditure Savings
(In billions of U.S. dollars)

Department	FY 2004 Outlays	Proposed Reductions	Examples for Areas of Expenditure Savings	Reduction Amount	Type of Reform
Agriculture	77.7	29.7	Farm Service Agency	16.9	Terminate
			Risk Management Agency	4.0	Terminate
Commerce	6.2	1.9	Econ. Development Administration	0.4	Terminate
Education	62.8	62.8	Elem. and Secondary Education	25.0	Terminate/ Devolve to States
			Special Ed. and Rehab.	12.4	Devolve
			Student Aid	19.0	Terminate
Energy	20.6	6.0	General Science	3.4	Terminate
Health and Human Services	547.9	63.0	Temporary Assist. for Needy Families	18.9	Devolve
			NIH Applied R&D	12.5	Terminate
Homeland Security	30.7	7.0	State and Local Programs	3.8	Devolve
Housing and Urban Development	46.2	46.2	Low-Income Housing Assistance	22.3	Terminate
			Community Development Block Grants	6.0	Terminate
Interior	10.0	4.7	Bureau of Indian Affairs	2.2	Terminate
Justice	23.5	3.2	State and Local Law Enforcement Assist.	1.5	Devolve
Labor	60.0	7.1	Employment and Training Adm.	5.6	Terminate
State	11.3	2.3	Andean Counterdrug Initiative	1.0	Privatize
Transportation	58.0	11.6	Amtrak and related	1.5	Privatize
			Federal Aviation Administration	9.5	Privatize
			Federal Highway Administration	n/a	Privatize
			Federal Transit Administration	n/a	Privatize
Other Agencies and Activities	n/a	54.5	Agency for International Development	4.6	Terminate
			Army Corps of Engineers	4.3	Privatize
			EPA-State and Tribal Assistance Grants	4.0	Devolve
			Foreign Military Financing	5.4	Terminate
			Excess military bases	5.0	Terminate
			NASA	14.6	Terminate
			Small Business Administration	4.0	Terminate
Total Expenditure Savings		300.2			

Source: Edwards (2004).

17. ***Shifting responsibilities and reducing federal transfers to the states are also among the options considered.*** This could, in principle, improve finances at the federal level and impose additional fiscal discipline on states. However, the bulk of federal transfers to states is being used to finance priority areas such as health care and education, and the scope for achieving savings on a general government basis may therefore be relatively small.⁴² Moreover, state and local governments have already gone through several rounds of cost cutting, following a severe post-2000 decline in revenues and the expansion of state responsibilities in the late 1990s. Indeed, states may come under increasing pressure to raise revenues to respond to a 7-8 percent annual trend increase in Medicaid spending, which already accounted for about a fifth of total state expenditure in 2002.

C. Tax Policy Options

18. ***Future tax policy will depend partly on the fate of the 2001–03 tax cuts and the increasing reach of the AMT.*** Most of the tax cuts implemented in recent years are slated to expire by the end of FY 2010 at the latest (Table 4), requiring new legislation to make them permanent. The FY 2005 budget has included such a proposal, but there is a likelihood that many tax cuts will continue to be extended by Congress on a temporary basis only. For illustrative purposes, the cost of making the tax cuts permanent is estimated at around 2 percent of GDP per year by FY 2014 (CBO, 2004; Gale and Orszag, 2004); if this were combined with permanently extending and indexing AMT relief, the cost would rise to about 3¼ percent of GDP (\$500 billion) per year.

19. ***Although tax revenues may need to increase over the medium-term, reversing recent cuts in marginal income tax rates may not be optimal.*** The revenue effect of reversing the tax cuts would be substantial, but many analysts have argued that tax cuts are needed to offset bracket creep caused by rising real incomes and contribute to expenditure discipline. Moreover, although U.S. marginal income tax rates are currently not high by international standards, a comparison with other industrial countries suggests that U.S. taxation is primarily income-based (Box 1). Tax policy could therefore seek to preserve the efficiency-enhancing effects of the recent tax cuts through measures to broaden the tax base and increasing the share of consumption-based taxes.

20. ***There remains considerable scope for simplifying the income tax structure and broadening the tax base.*** In 2003, the U.S. personal income tax system has provided \$675 billion (6.2 percent of GDP) worth of tax credits and exemptions, many of which are targeted at specific economic activities or particular groups of taxpayers. As documented in CEA (2003), among others, these tax expenditures add to the complexity of the U.S. tax system, increase compliance cost, and can give rise to unproductive behavior aimed at tax

⁴² While some analysts point out that grants to states have increased from 8 percent of federal spending in FY 1960 to 18 percent in FY 2004 (Edwards, 2004b), others have suggested that federal policies have contributed to fiscal problems at the state level in recent years (Lav and Brecher, 2004).

Table 4. FY 2005 Budget Proposals for Extending the 2001 and 2003 Tax Cuts

Enacted Policy	Information Reported	Pre-EGTRRA	EGTRRA	JGTRRA	FY 2005 Budget		
General Income and Estate Tax Cuts							
Reduce top four income tax rates	Tax rate	28, 31, 36, 39.6	2001-03 2004-05 2006-10	27, 30, 35, 38.6 26, 29, 34, 37.6 25, 28, 33, 35	2003-10 25, 28, 33, 35	2011 and on 25, 28, 33, 35	
Create 10 percent bracket	Income taxed at 10 percent for married couples	N/A	2001-07 2008 2009-10	\$12,000 \$14,000 Indexed	2003 2004	\$14,000 \$14,300	2005 and on \$14,300
Repeal PEP and PEASE	Percent reduction relative to pre-EGTRRA law	N/A	2006-07 2008-09 2010	33 percent 66 percent Repealed		2011 and on Repeal	
Repeal estate tax	Exemption level, highest effective tax rate	\$675,000 60 percent	2002 ... 2009 2010	\$1 million, 50 % ... changing to ... \$3.5 million, 45 % Repeal		2011 and on Repeal	
Increase AMT Exemption	Exemption level (unindexed)	\$33,750 Single \$45,000 Married	2001-04	\$35,750 Single \$49,000 Married	2003-04	\$40,250 Single \$58,000 Married	2005 only \$40,250 Single \$58,000 Married
Reduce dividend tax rates	Tax rate	Taxed as ordinary income			2003-07 2008	5, 15 0, 15	2009 and on 0, 15
Reduce capital gains tax rates	Tax rate	10, 20 (with exceptions)			2003-07 2008	5, 15 0, 15	2009 and on 0, 15
Children and Marital Status							
Expand child credit	Maximum credit amount (unindexed)	\$500	2001-04 2005-08 2009 2010	\$600 \$700 \$800 \$1,000	2003-04	\$1,000	2005 and on \$1,000
Expand standard deduction for married couples	Deduction for couples as percent of deduction for singles	167 percent	2005 2006 2007 2008 2009-10	174 percent 184 percent 187 percent 190 percent 200 percent	2003-04	200 percent	2005 and on 200 percent
Expand 15-percent bracket for married couples	Maximum income as percent of maximum for singles	167 percent	2005 2006 2007 2008-10	180 percent 187 percent 193 percent 200 percent	2003-04	200 percent	2005 and on 200 percent
Expand EITC for married couples	Increase beginning and end of phase-out.	N/A	2002-04 2005-07 2008 2009-10	\$1,000 \$2,000 \$3,000 Indexed			2011 and on Indexed
Saving							
Raise traditional and Roth IRA contribution limits	Contribution limit	\$2,000	2002-04 2005-07 2008 2009-10	\$3,000 \$4,000 \$5,000 Indexed			2011 and on Indexed
Increase 401(k) contribution limits	Contribution limit	\$10,000	2002-06 2006 2007-10	Raise \$1,000 per year \$15,000 Indexed			2011 and on Indexed
Increase IRA contribution limits for people over 50	Additional allowable contributions	N/A	2002-05 2006-10	\$500 \$1,000			2011 and on \$1,000

Table 4. FY 2005 Budget Proposals for Extending the 2001 and 2003 Tax Cuts (concl.)

Enacted Policy	Information Reported	Pre-EGTRRA	EGTRRA		JGTRRA	FY 2005 Budget	
Saving (concl.)							
Increase section 401(k) contribution limits for people over 50	Additional allowable contributions.	N/A	2002	\$1,000		2011 and on Indexed	
			2003	\$2,000			
			2004	\$3,000			
			2005	\$4,000			
			2006	\$5,000			
Create Roth 401(k)	Contribution limit	N/A	2006-07	\$4,000	2005-07	\$4,000	2011 and on Indexed
			2008	\$5,000	2008	\$5,000	
			2009-10	Indexed	2009-10	Indexed	
Create Saver's Credit	Eligible income range for married couple, credit rate	N/A	2002-06	\$0-30,000	50%	Allow expiration	
				\$30,000-32,500	20%		
				\$32,500-50,000	10%		
Education							
Raise Education IRA contrib. limits	Contribution limit	\$500	2002-10	\$2,000		2011 and on \$2,000	
Increase eligibility for Education IRA	Income phaseout range	\$180,000-210,000	2002-10	\$190,000-220,000		2011 and on \$190,000-220,000	
Create deduction for education expenses	Eligible income cap for married couple, deduction limit	N/A	2002-03	\$130,000	\$3,000	Allow expiration	
			2004-05	\$130,000	\$4,000		
			2006	Expires			
Expand deductible student loan interest payments	Income phaseout range	\$45k-60k single \$90k-120k married	2002	\$50k-65k single		2011 and on Indexed	
			2003-10	Indexed	\$100k-130k married		
Create prepaid tuition programs	N/A	N/A	2002-10	Allows purchase of tuition credits		Make permanent	

Sources: OMB (2004); Joint Committee on Taxation; and Gale and Orszag (2004).

Box 1. Tax Revenue in the United States: An International Comparison

Reflecting the smaller size of the public sector compared to other industrial countries, U.S. general government revenues are relatively low. Prior to recent tax cuts, the revenue-to-GDP ratio reached a high of almost 30 percent in 2000, but has since dropped to 26 percent, the lowest among the G-7.

Income taxes

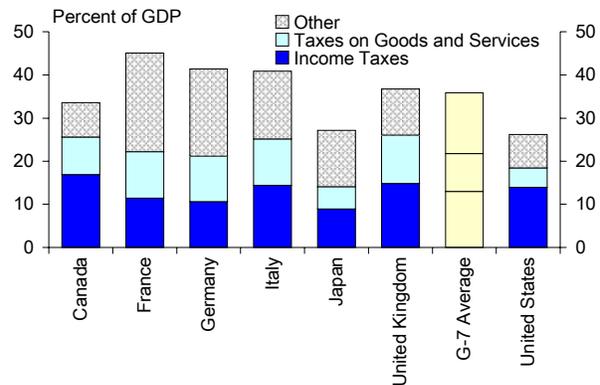
Compared to most other countries, the United States relies heavily on direct taxes. Almost half of the general government tax revenue comes from income taxes, the highest level in the G-7 and well above the OECD average of 36 percent. Individual income taxes contribute over 40 percent of revenue, greatly exceeding the G-7 average of 28 percent. Direct taxes on corporations raise 8 percent of revenues, near the G-7 average.

U.S. reliance on direct taxes is even more pronounced at the central government level, as fully 90 percent of federal tax revenues (excluding taxes dedicated to Social Security and Medicare) are from these sources. Other G-7 central governments draw about 50 percent of revenue from direct taxes and an almost equal 40 percent from taxes on goods and services. Because of the lower tax overall burden in the United States, however, income taxes only account for 14 percent of GDP, near the G-7 average of 13 percent.

Despite the heavy reliance on direct taxes, top U.S. marginal tax rates on personal income are the second-lowest in the G-7.

While France, Germany, and Japan apply lower rates to taxable income below US\$25,000, the U.S. tax system applies a more generous treatment to families, including through exemptions and tax credits, and the highest marginal tax rate is reached at higher levels of income than in most other countries. A married couple with two children and income of an average production worker pays 60 percent of the taxes paid by a single taxpayer with no children and the same income, the most preferential ratio in the G-7.

General Government Tax Revenue, 2003



General Government Tax Revenue, 2001 1/
(Percent of total)

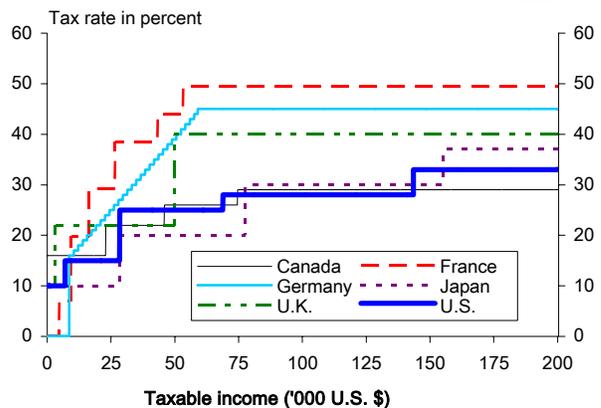
	Income, profits, and capital gains	Social security	Property	Goods and services	Other
<i>Federal Countries 2/</i>	42 [58]	24	6	25 [36]	3
Australia	56 [67]	0	9	29 [31]	6
Canada	48 [75]	15	10	25 [25]	3
Germany	29 [40]	40	2	29 [60]	0
United States	49 [91]	25	11	16 [7]	0
<i>Other Countries 2/</i>	33 [50]	30	8	25 [41]	3
France	25 [38]	36	7	25 [50]	6
Italy	34 [57]	29	5	26 [39]	6
Japan	33 [56]	38	10	19 [38]	0
United Kingdom	40 [51]	17	12	31 [39]	0
G-7 2/	37 [58]	28	8	24 [37]	2

Source: OECD, *Revenue Statistics*.

1/ Central government revenues in brackets.

2/ Unweighted average. Average for federal countries includes Austria, Belgium, and Switzerland.

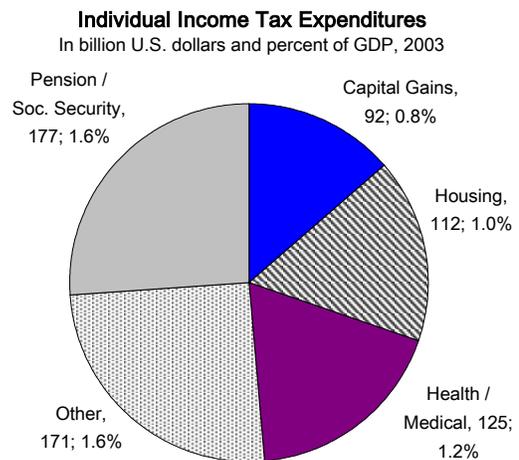
Taxable Income and Marginal Tax Rates



The phase-out of tax benefits makes marginal tax rates somewhat less favorable at lower income levels, as the marginal labor tax wedge for the family in the previous example is 54 percent, compared to 34 percent for the single person. The marginal labor tax wedges in other G-7 countries average 50 percent and 47 percent, respectively.

Tax rates on corporate and capital income display relatively little variance across countries. In 2003, effective average corporate tax rates in the G-7 ranged from 26 percent in the United Kingdom to 37 percent in Japan, with the U.S. at just under 33 percent (see Devereux and others, 2002, for methodology). Statutory rates, including local taxes, ranged from 30 percent in the U.K. to just over 40 percent in Italy and Japan, with the U.S. at 39 percent. Effective tax rates on capital range from 21 percent in Germany to 37 percent in Canada, with the U.S. at 27 percent (before the recent tax cuts), near the OECD average (Carey and Rabesona, 2002).

Federal tax expenditures greatly reduce individual and corporate income tax revenue. Tax expenditures comprise about 45 percent of potential individual income tax revenues, and 40 percent of potential corporate income tax revenues. While tax expenditures targeted at corporations are projected to decline to about 10 percent after the expiration of an accelerated depreciation provision, other tax expenditures will remain high. Many of the costliest tax breaks are focused on health insurance and pension contributions. Housing is also treated more favorably than in other G-7 countries. The United States provides a large tax break for mortgage interest, state and local property taxes are deductible at the federal level, and up to \$500,000 in capital gains are tax-exempt upon the sale of a house.



Other Direct Taxes

The U.S. proportion of revenue raised from Social Security contributions and property taxes is close to that of other countries. Social Security contributions accounted for 25 percent of revenue in 2001, near the G-7 average of 28 percent. Eleven percent of revenue came from property taxes, similar to Canada, Japan, and the United Kingdom, although the Euro area countries generally derived much less revenue from this source.

Taxes on Goods and Services, 2001 (Percent of GDP)			
	State and Local	Central	Total
<i>Federal Countries 1/</i>			
Australia	1.1	7.7	8.8
Canada	5.1	3.6	8.7
Germany	3.8	6.8	10.6
United States	3.7	0.8	4.6
<i>Other Countries 1/</i>			
France	1.5	9.3	10.8
Italy	1.2	9.5	10.8
Japan	1.4	3.7	5.1
United Kingdom	0.0	11.3	11.3
G-7 1/	2.4	6.4	8.8

Source: OECD, *Revenue Statistics*.
1/ Unweighted average. Average for federal countries includes Austria, Belgium, and Switzerland.

Taxation of Goods and Services

Goods and services carry a significantly lower tax burden in the U.S. than in other countries. Taxes on goods and services provide 16 percent of general government revenue, the lowest level in the OECD and about two-thirds the G-7 average. Taxes on both general consumption and on specific goods and services are the lowest in the OECD. The absence of a national VAT is the main factor in this difference, with

U.S. state and local governments relying more on goods and services than their counterparts in other federal countries. U.S. state and local governments draw 40 percent of revenues from taxation of goods and services, and 30 percent each from property taxes and taxes on income, profits, and capital gains.

	US\$ billion	Percent of GDP
Revenue effect of reversing 2001 and 2003 reductions in marginal tax rates, child credits, capital gains, dividend taxation, and the estate tax.	260	1¾
Personal tax expenditures (total value, 2009)	756	6¼
<i>Of which:</i> Exclusion of employer contributions for medical insurance	150	1½
Net exclusion of pension contributions and earnings	136	1¼
Deductibility of mortgage interest on owner-occupied homes	90	¾
Deductibility of charitable contributions	46	½
Exclusion of interest on life insurance savings	30	¼
Corporate tax expenditures (total value, 2009)	25	¼
Revenue effect of introducing a 4 percent federal VAT	300	2
<i>Memorandum item:</i>		
Projected fiscal deficit excluding Social Security over the medium-term.	...	3½–4

Sources: CBO (2003); OMB (2004); Rivlin and Sawhill (2004); and Fund staff calculations.

avoidance. The largest tax expenditures consist of exemptions for employer contributions to medical insurance premiums and health care, private pension contributions, mortgage interest payments, and investment income from life insurance policies (see Box 1). Eliminating some of these exemptions could be designed to generate significant revenues, restore some of the progressivity that the U.S. tax system lost in recent years, and improve allocative efficiency (Table 5).⁴³ For example, the maximum mortgage amount on which interest is deductible from income could be gradually reduced from \$1 million presently to limit tax expenditures on wealthier households. At the same time, proponents of health care reform have questioned the employer-based focus of U.S. health care insurance (Cutler, 2004), which suggests that reviewing tax incentives for corporate health care contributions could be part of a broader medical reform.

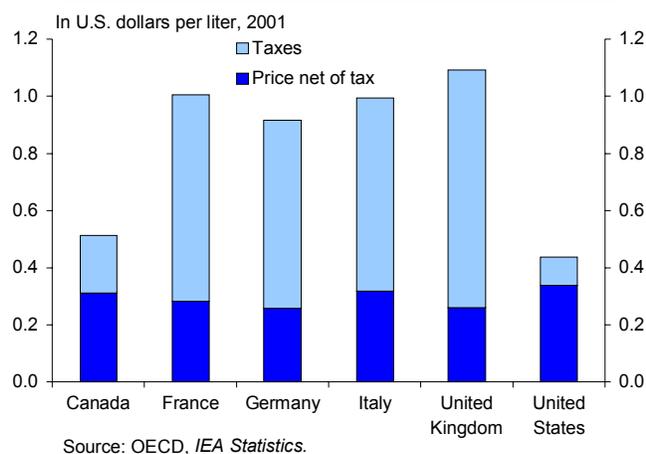
21. ***There is also ample room to broaden the corporate tax base.*** The administration estimates tax expenditures benefiting corporations to cost \$85 billion in FY 2005, an amount that is expected to essentially halve as depreciation schedules for newly purchased capital goods expire by end-December. Although these tax expenditures pale in comparison to those for households, the corporate income tax system has been characterized by a widening gap between corporate book and taxable profits. Desai (2003) finds that about half of the increase may be due to unexplained factors, consistent with abounding anecdotal evidence of

⁴³ Some analysts have suggested that the 2001-03 tax cuts have been highly regressive in nature and, depending on the way they would eventually be financed, may indeed lead to an increased economic burden on low-income households (e.g., Gale and Orszag, 2004).

companies exploiting loopholes to shift income to low-tax jurisdictions, including offshore destinations, or avoid taxation altogether. Potential revenue gains from tightening tax regulations and stepping up enforcement of existing rules are hard to estimate, but Desai's simulations indicate that, as of 2000, closing the gap between book income and taxable profits could have brought an additional \$130 billion in corporate income under the tax net. Simplifying the existing tax system would also reduce compliance costs and discourage rent-seeking behavior.⁴⁴

22. ***Raising energy taxes could yield fiscal and other benefits.*** From an international perspective, energy use in the United States is relatively lightly taxed, even accounting for geographical and climatic idiosyncrasies of the U.S. economy (Figure 9). Introducing higher energy taxes could raise fiscal revenues as well as help encourage more efficient U.S. energy use. For example, estimates suggest that raising gasoline taxes by 20 cents per gallon could yield around ¼-½ percent of GDP in revenues, although a part of this amount might be used to alleviate the impact of higher prices on certain energy users (e.g., rural households) and secure social acceptance (Prust and Simard, 2004). The overall macroeconomic impact would likely be relatively modest, in part because reduced demand could have a beneficial impact on global oil prices.

Figure 9. Prices and Taxes of Premium Unleaded Gasoline



23. ***Finally, a federal VAT or sales tax could be considered, providing a source of revenue that is considered to have the least distortive impact on economic activity.*** Experience from other industrial countries suggests that a federal VAT could yield about ½ percent of GDP per percentage point (somewhat below the theoretical maximum corresponding to the two-thirds share of consumption in national income). By 2014, a VAT rate of 4 percent could therefore contribute as much as \$300 billion in additional revenues.⁴⁵ Given the highly diverse tax systems among the states, a VAT would need to be carefully designed to gain widespread acceptance, contribute to economic efficiency, and limit

⁴⁴ Existing inefficiencies in the corporate tax code could be increased under current House and Senate versions of the bill to repeal \$5 billion worth of export subsidies provided under the Foreign Sales Corporation Act (FSC/ETI). The bills would offer up to \$167 billion in tax relief over 10 years, which may only be partly offset by revenue-raising measures.

⁴⁵ Contrary to the domestic debate on the VAT, which is often centered around *replacing* the existing system of income taxes with a VAT, this paper suggests to use the VAT as a *complementary* revenue source given its regressive nature.

transition costs (e.g., Keen, 2001). Nevertheless, a VAT could help bring services—which are largely sales-tax exempt—under the tax net, improve intergenerational equity by implicitly taxing retiree wealth, and provide a flexible and relatively efficient means to respond to future budgetary shortfalls.

D. Reforming Social Security and Medicare/Medicaid

24. ***Without providing an alternative to long-term fundamental reform of the Social Security and Medicare programs, more immediate measures could be taken to improve their financial position.*** Reforms of entitlement programs have traditionally protected workers in or near retirement by phasing in changes over a long time horizon, sometimes a decade or more. Nevertheless, relatively marginal changes could be effected over a shorter time horizon without significantly affecting the underlying structure of the programs. This could help delay the time when the Social Security and Medicare trust funds are expected to run out of funds and provide greater scope for the implementation of broader reforms.

25. ***Social security benefits could be more closely aligned with changes in the cost of living and improvements in life expectancy*** (Greenspan, 2004; Diamond and Orszag, 2004). Social Security benefits have automatically been adjusted to keep pace with increases in the Consumer Price Index, which has been found to overstate growth of the cost of living of the population as a whole. Adjusting benefit levels in line with a chained consumer price index computed by the Bureau of Labor Statistics would slow the growth of benefits while preserving the principle that they be maintained in real terms (Table 6). Moreover, although the increase in the Social Security retirement age from 65 to 66 years will be completed in 2005, the shift to 67 years is only slated to take place between 2017 and 2022. With longevity trends continuing to surprise on the upside, the next phase of the increase in the retirement age could be advanced.

26. ***Measures to broaden the burden of Social Security premiums could also be considered.*** The payroll tax used to finance Social Security is currently 12.4 percent on earnings up to \$87,900, a ceiling that is adjusted annually for growth in average wages. Following the 1983 reforms, some 90 percent of covered earnings were under the payroll tax

Table 6. Quantitative Impact of Selected Social Security and Medicare Reforms
(Estimated annual value in 2014)

	US\$ billion	Percent of GDP
Budgetary impact of limited Social Security, Medicare, and Medicaid reform	74	½
<i>Of which:</i> Improved consumer price index adjustment	17	...
Raise retirement age in 2012	2	...
SMI premium increase	16	...
Raise earnings ceiling for Social Security payroll tax to include 90 percent of taxable earnings	53	¼

Sources: Rivlin and Sawhill (2004); and Fund staff calculations.

ceiling, but shifts in the income distribution have since reduced that number to around 85 percent (Rivlin and Sawhill, 2004). Rather than increasing payroll contribution rates, about ¼ percent of GDP in additional revenues could be garnered by restoring the initial 90 percent ratio (equivalent to increasing the payroll tax ceiling to about \$130,000 in 2004).

27. ***Barring a broader consensus on health care reform, the scope for significant savings in the Medicare and Medicaid systems is likely to be relatively limited.*** Rivlin and Sawhill (2004) suggest a number of expenditure cuts that would yield up to ¼ percent of GDP in savings, involving stepped-up pressure on state governments and health care providers to seek greater operational efficiencies. The largest single element of their plan consists of reducing subsidies for subscribers to the Supplemental Medical Insurance (SMI) part of Medicare, leading to a hike in premium levels. Premiums were initially set in 1965 to cover half of SMI costs, but subsequent legislation increased the share of general revenues to account for 75 percent as of 1997. The 2003 Medicare Reform Act included provisions to reduce the subsidy element to as low as 20 percent for high income earners, but estimates suggest that only 5-6 percent of all Medicare beneficiaries would be affected by the reforms. Reducing the subsidy to 65 percent across the board would yield about \$16 billion (0.1 percent of GDP) by 2014.⁴⁶

E. Conclusion

28. **This chapter has presented a range of fiscal options that could help prepare the U.S. fiscal system for the impending demographic transition.** These measures would help reduce the budget deficit over the medium-term in a manner that would minimize the impact on, or even boost, economic efficiency and long-term growth prospects. This paper does not support a particular course of fiscal action, as there are obviously many combinations of measures possible (see Rivlin and Sawhill, 2004, for three fundamentally different consolidation scenarios). However, the size of the U.S. fiscal gap suggests that both expenditure and revenue measures will eventually be needed, in part because many of the factors that supported consolidation in the 1990s are no longer in place.

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⁴⁶ In addition to the introduction of Health Savings Accounts by the administration, other suggestions to strengthen market-based principles by providing Medicare participants with greater choice have cited the Federal Employees Health Benefit Plan (FEHBP) as an example (e.g., Francis, 2003). Although potentially large, the magnitude of savings for introducing an FEHBP-type approach nationwide remain yet to be specified.

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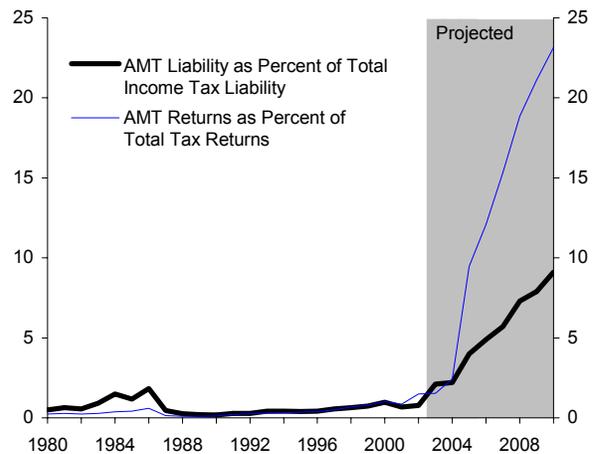
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IV. THE INCREASING SCOPE OF THE ALTERNATIVE MINIMUM TAX⁴⁷

1. *The Alternative Minimum Tax (AMT) for individuals was created to reduce horizontal inequity in the personal income tax system.*⁴⁸ Minimum taxes in the United States date from 1970, and have been formulated with the stated objective of ensuring that high-income taxpayers pay their “fair” share of taxes, in particular by reducing the number of high-income filers with no income tax liability.⁴⁹ This objective is pursued by limiting the extent to which tax preferences (deductions, exemptions, and credits) are allowed to reduce taxable income.

2. *The AMT has had a small but growing impact on U.S. taxpayers.* Through the mid-1990s, fewer than ½ percent of individual taxpayers were subject to the AMT. In recent years, this share has increased to 1½ percent, and is projected to exceed 20 percent by 2010 (Figure 1).⁵⁰ The share of revenue obtained from the AMT has similarly increased from less than 1 percent of personal income tax revenues in the 1990s to about 2 percent at present, and is projected to reach about 9 percent by 2010.⁵¹

Figure 1. The Expansion of the AMT, 1980 - 2010



Sources: IRS, *Statistics of Income*; Harvey and Tempalski (1997); and Burman, Gale, and Rohaly (2003).

3. *The AMT’s reach to middle-income households has expanded partly as a result of cuts in marginal income tax rates.* The decline in ordinary tax liabilities has contributed to an increasing number of households falling below the threshold for filing AMT returns. While recent budgets have temporarily raised AMT exemption amounts by almost 30 percent, AMT relief is slated to expire at the end of 2004, pending further legislation. However, even providing permanent relief would only slow, not stop, the AMT’s spread to middle-income taxpayers.

⁴⁷ Prepared by Andrew Swiston.

⁴⁸ This paper focuses on the AMT for individuals. There is also an AMT for corporations; see Lyon (1997) for a detailed study.

⁴⁹ See, for example, Joint Committee on Taxation (JCT, 1976), p. 105, JCT (1986), pp. 432-433.

⁵⁰ Unless otherwise noted, estimates for 2003 and projections are from Burman, Gale, and Rohaly (2003). Their findings are broadly consistent with estimates in CBO (2003a, 2004a, 2004b), Feenberg and Poterba (2003), JCT (2001, 2003), and Rebelein and Tempalski (2000).

⁵¹ Revenues attributed to the AMT only relate to the tax liability in excess of that determined by the standard personal income tax system.

4. ***Without reform, the AMT will increasingly complicate and distort the personal income tax system.*** While AMT revenues are projected to offset about one third of the cost of recent tax cuts over the medium-term (Burman, Gale, and Rohaly, 2003), their growing reach would add to the already considerable compliance cost for U.S. taxpayers. Moreover, most taxpayers would eventually fall under the AMT by reason of claiming exemptions for dependents and deducting state and local income taxes, which could lead to questions about the design of the U.S. tax system. Indexing tax brackets and exemption amounts to inflation therefore remains central to AMT reform, but additional spending cuts or revenue-raising measures would be necessary to offset the associated revenue loss.

A. AMT Design

5. ***The AMT has been designed as a parallel tax liability for high-income taxpayers*** (Box 1). Taxpayers fulfilling AMT criteria are required to calculate both their regular income tax and a tentative minimum tax liability. Their final tax payment is determined by the higher of the two amounts. If the minimum tax exceeds the regular income tax, the difference between the two is counted as AMT liability.

6. ***The AMT is designed to tax a broader income base than the regular income tax.*** While the standard deduction under the AMT is larger than that for the regular income tax, most of the other provisions of the AMT limit deductions taken under the regular income tax. The AMT can also limit a taxpayer's eligibility for tax credits.

7. ***Statutory marginal tax rates are intended to be lower under the AMT than under the regular income tax.*** The AMT has a flat rate structure with only two brackets, 26 and 28 percent, while brackets in the regular income tax currently range from 10 to 35 percent. It was designed to have a lower marginal rate than the regular income tax, while still yielding higher revenues from taxpayers who would otherwise claim large amounts of deductions and exemptions. However, Burman, Gale, and Rohaly (2003) show that many taxpayers face a higher effective marginal tax rate under the AMT than under the regular tax, due to the AMT's expansion to middle-income taxpayers and rate reductions in the regular income tax. Moreover, the phase-out of the AMT exemption pushes the statutory marginal rates to 32.5 and 35 percent for some incomes.

8. ***The scope of the AMT has expanded because its parameters are not indexed to inflation, unlike the regular income tax.*** The tax brackets, standard deduction, and personal exemptions in the regular income tax were indexed in 1981. The AMT's lack of indexing has led to bracket creep, which pushes taxpayers into the AMT even if their real incomes have not significantly increased.

B. Experience with the AMT and Recent Developments

9. ***Calculating the AMT imposes significant costs on taxpayers and complicates tax policy.*** All taxpayers have to fill out a worksheet to determine whether they should file the AMT form, and over 75 percent of those required to file end up owing no AMT (NTA,

Box 1. Calculating the AMT

The AMT has received a great deal of criticism for its complexity (see, for example, JCT, 2001; Joint Economic Committee, 2001; and NTA 2001, 2004), but for many taxpayers, AMT calculation can be straightforward (Feenberg and Poterba, 2003). The following are the steps in calculating the AMT:

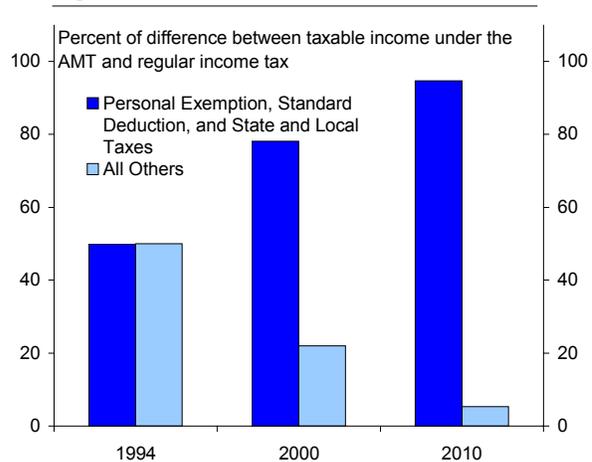
- **Calculate regular income tax liability** (before credits).
- **Determine whether filing the AMT form is required.** A taxpayer is automatically required to file the AMT form if claiming certain preferences, including accelerated depreciation, exercise of stock options when the stock is not disposed of in the same year, and investment interest expense. Other taxpayers fill out a twelve-line worksheet and may be required to file under the AMT depending on their income and size of their regular income tax liability. Most taxpayers required to submit an AMT form end up owing no AMT (NTA, 2001).
- **Calculate Alternative Minimum Taxable Income (AMTI).** AMTI includes 26 adjustments, called AMT preferences, to the definition of adjusted gross income (AGI) used by the regular income tax. Seven of these preferences require entering the amount from a line found on another form or schedule, and another two of the adjustments are simple transformations of amounts found elsewhere. The remaining 17 preferences differ from the regular income tax because the AMT applies different treatments to various income types, capital gains, and asset valuations. These provisions require more advanced record-keeping and calculations but tend to affect only a small number of taxpayers with relatively complex business and investment arrangements. The AMT also treats personal exemptions and the standard deduction as *de facto* preference items, because AGI, and not taxable income, is used in computing AMTI.
- **Determine the applicable AMT exemption.** For 2004, the exemption is \$29,000 for married filers filing separately, \$40,250 for single filers and heads of households, and \$58,000 for married filers filing jointly. The exemption phases out at a rate of 25 cents per dollar, beginning at income levels of \$75,000, \$112,500, and \$150,000 respectively.
- **The allowable exemption is then subtracted from AMTI**, with the tax rates of 26 percent and 28 percent (for AMTI over \$175,000) being applied to the difference. The phase-out of the AMT exemption results in effective rates of 32.5 percent and 35 percent over the phase-out range (ending at over \$380,000 for married filers filing jointly).
- **A taxpayer's tentative minimum tax is calculated by further subtracting any foreign tax credit for which the taxpayer is eligible.** If the amount remaining exceeds the regular income tax liability, the difference is owed as AMT liability. If regular income tax liability exceeds the tentative minimum tax, then no AMT is owed.
- **Apply tax credits to find final tax liability.** Prior to 1999 and after 2003 nonrefundable tax credits can only reduce regular income tax liability to the level of the tentative minimum tax. For example, a taxpayer with regular income tax liability of \$10,000, tentative minimum tax of \$9,000, and credits of \$3,000, would be able to apply \$1,000 of the credits to the regular income tax liability to reduce it to the level of the tentative minimum tax, but would lose \$2,000 in credits. Between 1999 and 2003, the taxpayer could have used all \$3,000 in credits to reduce total tax liability to \$7,000. The child, adoption, and IRA credits will continue to receive this treatment through 2010, whereas refundable credits (the earned income credit and refundable portion of the child credit) are available regardless of whether a taxpayer has AMT liability (in the unlikely event that the AMT would apply to someone eligible for those credits).

2001). Lack of knowledge about the system and difficulties in estimating AMT liability before all tax records are collected have led to increased audits and AMT-related tax penalties, especially among taxpayers who make estimated payments (NTA, 2004), although these costs are diminishing with the growing use of tax-preparation software. For policymakers, estimates of the revenue effects of budget provisions are more complicated because of interactions between the AMT and regular income tax. For example, it has been estimated that by 2010, one-third of the benefits provided by the 2001 tax cuts will be taken back by increased AMT liabilities (Burman, Gale, and Rohaly, 2003). The implicit assumption that the AMT would continue in its present form led to lower estimates of the tax cuts' revenue impact than if AMT reform had been taken into account.

10. ***That said, the AMT appears to have reduced the number of high-income taxpayers with zero income tax liability in any given year.*** An estimated 90 percent of AMT taxpayers and 95 percent of revenues in 2003 came from taxpayers with Adjusted Gross Income (AGI) of over \$100,000. IRS data on high-income tax returns shows that only 0.1 percent of taxpayers with AGI over \$200,000 pay zero income tax in a given year (Balkovic, 2003). The CBO (2004b) found that 1,100 taxpayers with AGI over \$500,000 paid federal taxes in 2001 only because of the AMT. However, taxpayers with an AGI between \$100,000 and \$500,000 are the most likely to fall under the AMT, because its lower marginal rates generally imply that taxpayers with higher incomes have a larger regular income tax liability.

11. ***Although the AMT was originally intended to target excessive use of tax preferences, most AMT revenue now comes from preventing the use of personal exemptions and state and local tax deductions.*** The minimum tax system was originally targeted at recipients of capital gains and other investment income, which received preferential treatment under the regular income tax. However, the Tax Reform Act of 1986 removed these items as AMT preferences. Rebelein and Tempalski (2000) find that a growing proportion of the difference between AMTI and AGI is accounted for by state and local tax deductions, personal exemptions, and the standard deduction (Figure 2), which would not suggest the excessive use of tax preferences. The lack of indexation has, over time, increased the importance of these tax preferences in determining a taxpayer's AMT liability.

Figure 2. AMT Preference Items



Sources: Harvey and Tempalski (1997); and Rebelein and Tempalski (2000).

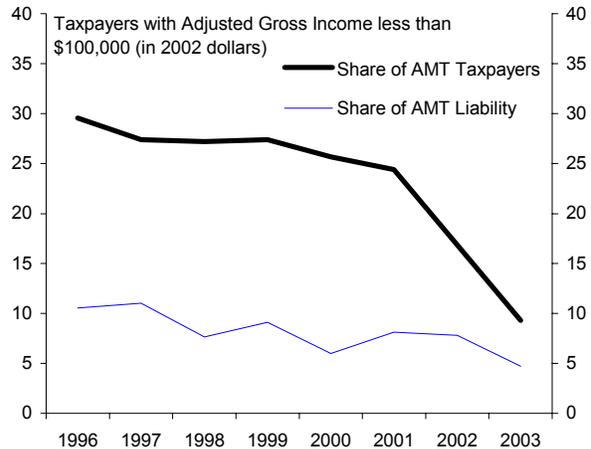
12. ***High-income taxpayers have also been able to reduce their tax liability significantly by using tax preferences not targeted by the AMT.*** Many taxpayers without income tax liability claim deductions for investment interest paid or unlimited miscellaneous deductions that reduce their taxable income by over 60 percent, or use a combination of credits to

achieve an equivalent reduction in their tax liability (Balkovic, 2003). High-income taxpayers are also more likely to use large deductions as a result of non-cash charitable contributions and the carryover of cash charitable contributions from previous years, while deriving a higher percentage of their income from sources with more favorable tax treatment, including capital gains, dividends, and tax-exempt interest (Campbell and Parisi, 2003).

13. **Recent legislation has temporarily lessened the AMT's impact on middle-income taxpayers** (Figure 3):

- Provisions allowing all personal nonrefundable credits to reduce AMT liability were in effect from 1999 through 2003.⁵² Subsequently, AMT liability can only be reduced by the child, adoption, and IRA credits until 2010.
- The 2001 and 2003 tax cuts temporarily increased the exemption amounts from \$45,000 to \$58,000 for married joint filers and from \$33,750 to \$40,250 for single filers. The FY 2005 budget proposes to extend this relief through 2005 (Figure 4). However, the exemptions would revert to their pre-2001 values in 2006.

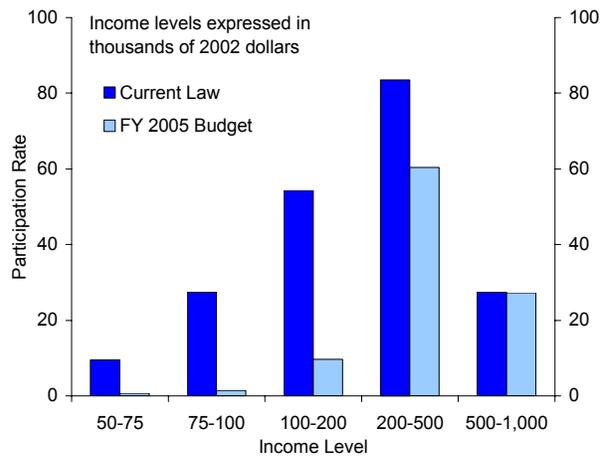
Figure 3. AMT and the Middle Class, 1996-2003



Sources: IRS, *Statistics of Income*; Burman and others (2002); and Burman, Gale, and Rohaly (2003).

14. **These changes have helped to reduce the AMT burden of taxpayers with AGI below \$100,000.** For example, the number of taxpayers in this group declined by 25 percent between 2000 and 2003, and the group's share of total AMT liabilities dropped from 11 percent in 1997 to 5 percent in 2003.⁵³ However, these trends

Figure 4. Impact of FY 2005 Budget Proposals on AMT Participation Rates by Income in 2005



Source: Burman and others (2004).

⁵² The FY 2005 budget proposes an extension for 2004 and 2005 of the provision that allowed all credits to reduce AMT liability. Nonrefundable personal credits are those that are only allowed to reduce a positive tax liability, while refundable personal credits like the earned income credit are counted as payments, can be refunded to taxpayers with no tax liability, and are available regardless of a taxpayer's AMT liability.

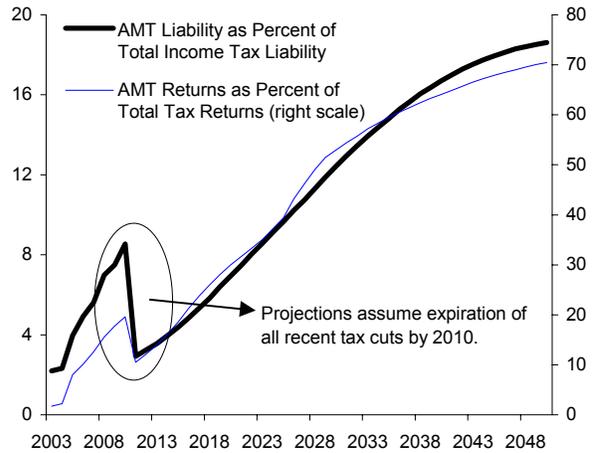
⁵³ The share of AMT liability owed by this group peaked in 1997 because, starting in 1998, nonrefundable credits were allowed to reduce regular income tax liability but not AMT liability (Burman and others, 2002).

would likely reverse if the temporary relief were allowed to expire.

C. Medium-Term Outlook and Pressures for Reform

15. **The impact of the AMT is projected to increase significantly over the coming years.** Various studies project the number of AMT taxpayers to jump to 30-35 million in 2010, with the AMT contributing around 9 percent of income tax revenue at that time (Table 1). Burman, Gale, and Rohaly (2003) estimate that the effects of inflation will add about 10 million taxpayers to the AMT between 2003 and 2010, and that an additional 18.8 million taxpayers would face the AMT because of marginal rate cuts enacted in 2001. Without the tax cuts, these estimates suggest that the AMT would have accounted for only 2½ percent of income tax revenue, instead of 9 percent. Even if the 2001 and 2003 tax cuts were not made permanent, the AMT’s expansion would continue over the long term due to the lack of indexation. In that case, the CBO (2003a) projects that 70 percent of households would be subject to the AMT by 2050, contributing over 18 percent of personal income tax revenue, equivalent to 3 percent of GDP (Figure 5).

Figure 5. The Expansion of the AMT, 2003 - 2050



Source: CBO (2003a).

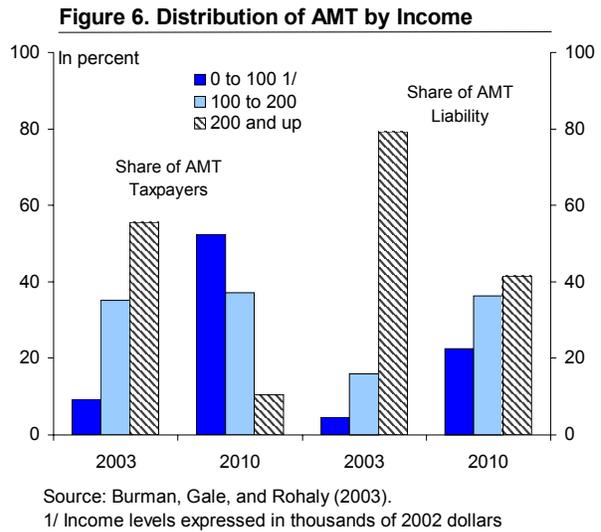
Table 1. Projected AMT Revenue and Taxpayers

	AMT Revenue as Percent of Total Personal Income Tax Revenue			AMT Taxpayers - Millions				
	Burman, Gale, and Rohaly	CBO	Feenberg and Poterba	Burman, Gale, and Rohaly	CBO	Feenberg and Poterba	JCT	U.S. Treasury
2003	2.1	2.2	2.0	2.4	2.5	4.1	2.2	2.5
2010	9.1	8.6	8.8	33.1	29.5	37.1	30.0	32.0

Sources: Burman, Gale, and Rohaly (2003); CBO (2003a, 2004b); Feenberg and Poterba (2003); JCT (2003); and U.S. Treasury (2004).

16. **Under current law, middle-income taxpayers would bear an increasing proportion of the AMT.** The CBO (2004a) estimates that the number of AMT taxpayers would jump by 9 million if AMT relief was withdrawn in 2005, increasing AMT revenue by 50 percent. The number of AMT taxpayers with AGI below \$100,000, expressed in 2002 prices, is projected to swell from 225,000 in 2003 to over 17 million in 2010, or over half of all AMT taxpayers (Figure 6). The share of AMT revenues paid by middle-income taxpayers would also rise sharply from 5 percent in 2003 to 23 percent in 2010.

17. *By 2010, most taxpayers would be paying the AMT by reason of claiming personal exemptions for dependents and deducting state and local taxes from income.* These two factors would account for 90 percent of the difference between AMTI and AGI by 2010 (Rebelein and Tempalski, 2000). Feenberg and Poterba (2003) show that, by 2010, taxpayers with two or more dependents would be twice as likely to pay AMT as the general population, and the likelihood of owing AMT would be much higher for residents of states with high income taxes and for married taxpayers. Even taxpayers not making itemized deductions will be affected—the share of AMT filers claiming the standard deduction is projected to grow to 30 percent, compared to 6 percent in 2001 (CBO, 2004b).



D. Policy Options

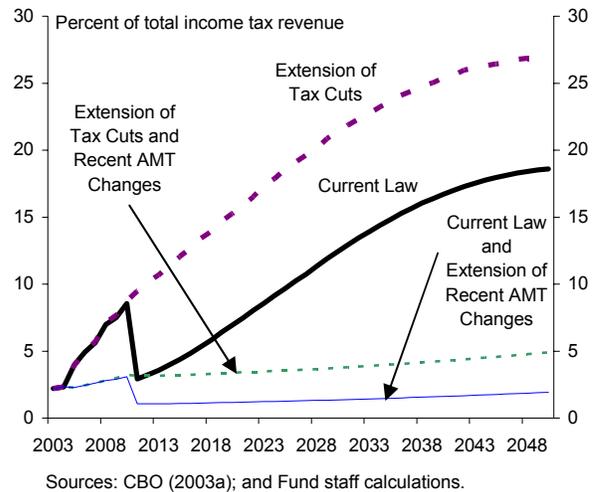
18. *Given the increasing number of middle-income taxpayers falling under the AMT, many analysts expect that the system of minimum taxation will be reformed over the coming years.* Five policy options are commonly suggested:

- **Extend recent changes.** As discussed earlier, the increased exemption amount and the ability to use nonrefundable credits to reduce AMT liability have lessened the impact on middle-class taxpayers. Maintaining the current exemption amount would cost about 0.2 percent of GDP in 2014, while allowing all credits to reduce AMT liability would cost about a fourth that much (CBO, 2004a).⁵⁴
- **Remove personal exemptions, the standard deduction, and state and local tax deductions as AMT preference items.** Their removal would mean forgoing about 90 percent of AMT revenue, or 1/3 of a percent of GDP by 2014, with two-thirds of the cost accounted for by the removal of state and local tax deductions (CBO, 2003b, 2004b). Since personal exemptions are phased out for taxpayers with AGI over \$104,625, allowing them to reduce taxable income under the AMT would largely benefit middle-income taxpayers, while high-income taxpayers would benefit the most from removing state and local tax deductions.

⁵⁴ Estimates of the costs of interaction with other policy measures and debt service costs associated with each policy change are unavailable. CBO (2004a) estimates that the debt service costs in 2014 of indexing the AMT's parameters and maintaining the higher exemption would amount to 0.1 percent of GDP. Extending the 2001 and 2003 tax cuts along with AMT reform would result in an added 0.1 percent of GDP revenue loss in 2014, due to interaction effects between the regular income tax and AMT and additional debt service costs.

- Index to inflation.** Indexation would be essential to slowing the long-term growth of AMT revenues, whether or not the 2001 and 2003 tax cuts are extended (Figure 7). This option would be less progressive in the short-run than extending the higher exemption amounts and use of personal nonrefundable credits, but would limit the AMT’s long-term spread to middle-income families. Adding indexation to the extension of the higher exemption amounts would cost less than 0.1 percent of GDP per year (CBO, 2004a).

Figure 7. AMT Revenue Scenarios, 2003 - 2050



- Repeal.** Some observers have argued that AMT revenues are worth less than the cost of complexity created by the tax, and that the AMT should therefore be repealed (e.g., JCT, 2001; NTA 2001, 2004). Repeal would be the most expensive option, costing 0.4 percent of GDP by 2014 (CBO, 2003a). It would imply an immediate 2 percent reduction of personal income tax revenues, a 9 percent cut by 2010, and a cut of over 18 percent in the long-term (CBO, 2003a). A repeal would be regressive, as households with AGI over \$100,000 would receive over 90 percent of the immediate benefit. Repeal could also increase incentives to use tax preferences more aggressively, offsetting some of the benefits of a simpler tax system.
- Target common tax avoidance practices.** The AMT attempts to balance conflicting objectives—providing preferential tax treatment to certain activities but limiting the excessive use of tax preferences. Targeting deductions and exemptions that are more indicative of tax avoidance would broaden the tax base while still allowing taxpayers to maximize their legitimate use of preferences. More attention could also be given to the income side of the equation, a more costly source of tax avoidance (Brown and Mazur, 2003).

19. *AMT reform could provide a useful opportunity for restoring the tax to its original purpose—curbing the excessive use of tax preferences—and simplifying the U.S. tax system.* Reducing the AMT’s impact would enhance the efficiency of the tax system, in part by eliminating the need for a growing number of taxpayers to calculate two different tax returns. However, AMT reform would also result in substantial future revenue losses, which would need to be offset by expenditure cuts or revenue increases that could introduce new inefficiencies. This suggests that AMT reform should be included in a broader review of the

U.S. tax system, aimed at maintaining strong growth incentives while potentially securing additional revenues through base-broadening and other measures.⁵⁵

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⁵⁵ Chapter III discusses possible revenue-raising measures among other options for fiscal consolidation.

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V. MONETARY POLICY OVER THE U.S. CYCLE⁵⁶

1. ***The achievement of price stability in the United States has resulted in new challenges and re-opened the debate on how monetary policy should be conducted over the cycle.*** Particularly against the background of the deflation risks that emerged in 2003, the Federal Reserve has shifted its emphasis from an “opportunistic approach” to reducing inflation to a “risk management” approach, recently endorsed by Federal Reserve Chairman Alan Greenspan.⁵⁷ More generally, central bankers consistently emphasize that setting monetary policy is a complex process, involving a range of judgmental factors that cannot be condensed into a parametric approach.
2. ***By contrast, the focus of recent academic work has been on analyzing simple policy rules.*** This analysis suggests that credible commitments by central banks to a monetary policy rule can generate higher economic welfare in terms of lower inflation and output volatility.⁵⁸ Moreover, empirical studies have suggested that relatively simple policy rules based on the path of inflation and output provide reasonable descriptions of central bank behavior. In particular, Taylor (1993) and subsequent authors have argued that monetary policy can be approximated by a “rule” in which the Federal Reserve targets a fixed real interest rate, and the federal funds rate responds to deviations of inflation from a desired target and of output from its potential level.
3. ***The latest cyclical episode has been unusual in the extent to which interest rates have diverged from such a “Taylor rule.”*** Compared with both the standard rule described above and augmented rules that allow for interest rate smoothing, the Fed eased monetary policy much faster than would have been predicted. As a result, a number of analysts (and Fed officials) have questioned the usefulness of the Taylor rule as a characterization of monetary policy in the United States.
4. ***This paper seeks to help reconcile the more nuanced characterization of monetary policy espoused by many policymakers with rules typically estimated in academic analysis.*** In particular, the paper examines a policy rule whose parameters are not constant, with a focus on whether there is evidence that monetary responses vary systematically over the business cycle. Such behavior would be consistent with the notion that policymakers consider more factors than are captured in a typical monetary response regression.

⁵⁶ Prepared by Pau Rabanal. A fuller description of the results is available from the author.

⁵⁷ See, for instance, speeches delivered at the Jackson Hole conference (Greenspan, 2003) or at the 2004 meeting of the American Economic Association (Greenspan, 2004).

⁵⁸ See Woodford (2003) and Clarida, Galí and Gertler (1999). Earlier work by Kydland and Prescott (1977) and Barro and Gordon (1983) emphasized how a rules-based approach reduces the inflationary bias in monetary policy.

A. A Policy Rule with Time-Varying Parameters

5. ***To obtain a sense of the overall stability of policy responses over time, a relatively standard Taylor rule is estimated in a manner that allows parameters to change.***⁵⁹ It is assumed that the Federal Funds rate (i_t) reacts to inflation (π_t), output growth (Δy_t), as well as past nominal interest rates (representing the desire by the central bank to smooth interest rate fluctuations). The time-varying intercept (c_t) subsumes the real interest rate target, the inflation target, and the steady state growth rate that cannot be estimated separately.⁶⁰ The specification is:

$$i_t = \rho_t i_{t-1} + (1 - \rho_t)(c_t + \gamma_{\pi,t} \pi_t + \gamma_{g,t} \Delta y_t) + \varepsilon_t. \quad (1)$$

The parameters are allowed to vary over time and follow “random walks,” in which the current estimate is equal to last period’s estimate plus an unpredictable disturbance. Hence, for example:⁶¹

$$\rho_t = \rho_{t-1} + \varepsilon_t^\rho \quad (2)$$

6. ***The results indicate significant variation in the coefficients on the Taylor rule over time, particularly as regards to responses to the inflation rate*** (Figure 1).⁶² The coefficient capturing the long-run response of the federal funds rate to changes in inflation ($\gamma_{\pi,t}$) rose through the early 1980s and then fell, becoming negative in recent years as concerns emerged about the risk of deflation. This shift is consistent with earlier work examining changes in the Taylor rule in the early 1980s. However, the results also suggest that the sensitivity of the policy rule to deviation of inflation from its desired rate decreases during or after recessions, as well as during other periods of stress on the real economy, such as the stock market crash of 1987, the Iraq invasion of Kuwait in 1990, the collapse of Long Term Capital Management in 1998, and the September 11, 2001 terrorist attacks. Inflection points are also seen in the parameters on output growth ($\gamma_{g,t}$) and interest rate smoothing (ρ_t), with both exhibiting a tendency to fall during an economic downturn.

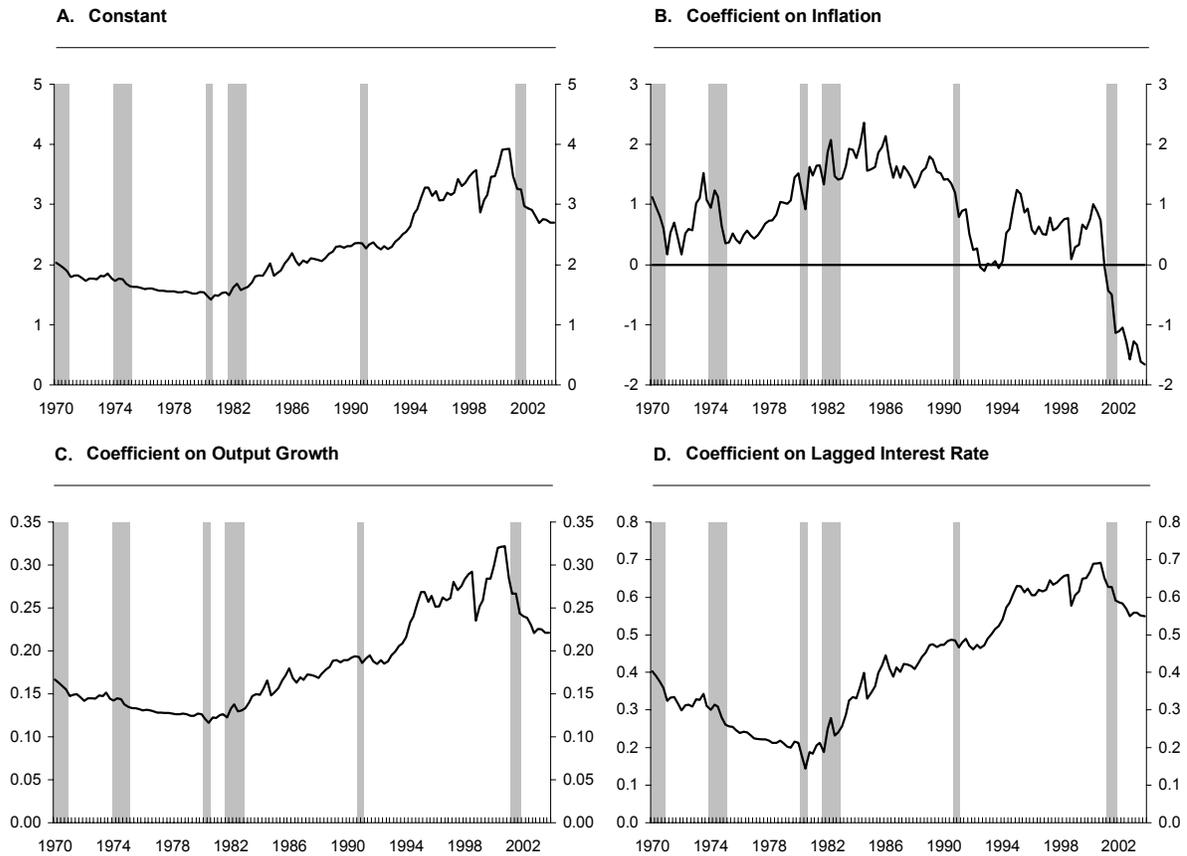
⁵⁹ The existing literature generally tests for differences in coefficients over subsamples. For instance, Clarida, Galí and Gertler (2000), in a forward looking version of the Taylor rule, find significant differences in the coefficients of the Taylor rule between the 1960–79 and 1982–99 periods.

⁶⁰ Following Erceg and Levin (2003), it is assumed that the Taylor rule reacts to output *growth* rather than the output *gap*, which has the advantage that all variables in the right hand side are observable, avoiding the complications associated with uncertainty about estimation of the output gap.

⁶¹ The variances of the shocks are estimated using maximum likelihood. The Kalman filter is subsequently used to obtain the one-step ahead forecasts and the smoothed series for the coefficients, as in Hamilton (1994).

⁶² Bayoumi and Sgherri (2004) present similar evidence on time-varying coefficients in the Taylor rule.

Figure 1. Time Varying Estimates of the Taylor Rule¹



Sources: NBER and Fund staff calculations.

¹Recessions are shaded.

B. Letting the Taylor Rule Vary Over the Cycle

7. *This section investigates whether monetary policy responds differently during periods of economic expansion and weakness.* The first step in testing this hypothesis is to estimate the probability of being in either an expansion or a recession, using the methods developed in Hamilton (1994). In a second step, the coefficients for the Taylor rules in these two states are estimated and compared.

8. *More specifically, a switching regime model was estimated, using the path of real output growth to calculate the probability of the economy being in a state of “expansion”*

or “recession”.⁶³ The results indicate that real GDP growth in expansions averages an annualized 4½ percent compared with -½ percent in recessions, and point to important asymmetries between these two states (Table 1). If the economy is already in an expansion, the chance of remaining in this state is just above 90 percent, implying an average length of expansions of almost three years. For a recession, the corresponding statistics are around 75 percent and one year. As a result, the economy is expected to be in an expansion about three-quarters of the time.

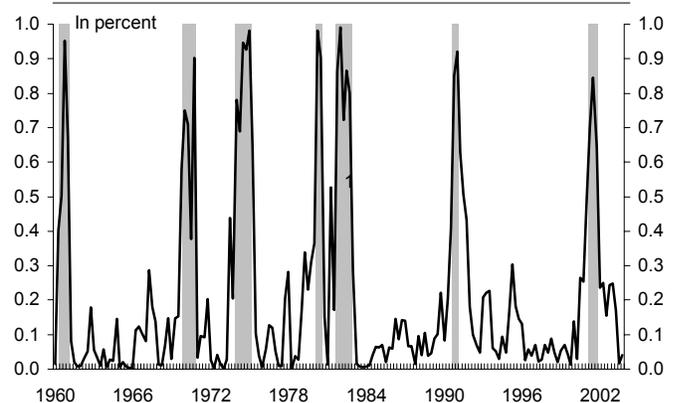
9. *Reassuringly, periods of recession as identified by the NBER coincide with high probability of being in such a situation* (Figure 2). The chance of being in a recession varies significantly over periods outside of the NBER recession dates. For example, the probability of still being in a downturn was comparatively high after the official end of the 1990 and 2001 recessions, periods in which the Federal Reserve removed stimulus relatively slowly.

10. *The results from estimating separate Taylor rules indicate that there are significant differences in monetary responses during expansions and recessions.* Regression results from the Taylor rule specified in equation (1), allowing responses to vary over the cycle using data from 1960, are reported in Table 2.⁶⁴ The coefficients on inflation and output growth reflect short-term responses of the federal funds rate.⁶⁵ These are the most relevant coefficients for a policy rule that varies over the cycle, as

Variable	Coefficient	Standard Error
Mean Growth in Expansions	4.62	0.38
Mean Growth in Recessions	-0.57	0.90
Probability of Staying in Expansion	0.91	0.03
Probability of Staying in Recession	0.73	0.09
Standard Deviation of Error Term	3.35	0.19

Source: Fund staff calculations.

Figure 2. Probability of Recession and NBER Recession Dates¹



Sources: NBER; and Fund staff calculations.

¹Recessions are shaded.

⁶³ Expansions are associated with positive output growth, and recessions with negative growth. The model is estimated using quarterly data from 1960 to 2003, assuming that transitions from one state to another follow a first-order Markov process.

⁶⁴ The results are obtained using weighted least-squares regressions, using the probabilities of being in each state as a weight. Starting in 1960 allows a sufficiently large number of recessions to be able to get an accurate reading of the impact of the cycle on monetary response.

⁶⁵ The coefficients are $(1-p)\gamma_\pi$ and $(1-p)\gamma_g$ in the nomenclature of equation 1.

they reflect the immediate response to cyclical conditions. By contrast, the long-run response also depends on current and future values of the smoothing parameter, and hence the (uncertain) future evolution of the cycle.

11. ***The results indicate that when the economy is in an expansion, the Fed responds more to inflation, responds less to growth, and smoothes interest rates more.***

Comparing the pure “expansion” and “recession” responses, the Fed’s short-term response to inflation is about one-and-a-half times as strong in an expansion than in a recession, while its equivalent response to output growth is only one-third as large. In addition, the coefficient on the lagged interest rate is considerably lower during recessions, indicating less concern of policymakers about smoothing interest rates. These coefficients are jointly statistically significant at the 5 percent level, largely due to the shift in the coefficient on output growth. Further tests indicate that these results are robust when it is assumed that the underlying policy rule has shifted over time, including in the early 1970s and 1980s.

Table 2. A Taylor Rule That Varies Over the Cycle 1/

	Recession	Expansion
Short-run response to inflation $(1-\rho)\gamma\pi$	0.11 (0.05)	0.17 (0.03)
Short-run response to output growth $(1-\rho)\gamma g$	0.27** (0.04)	0.09** (0.02)
Lagged interest rate (ρ)	0.89 (0.03)	0.95 (0.02)
R ²	0.94	0.96
Wald test of different coefficients	26.72**	

Source: Fund staff estimates.
1/ Standard error in parenthesis. ** indicate that coefficients are significantly different from each other at the 5 percent significance level. Critical value for $\chi^2(3)$ is 7.81.

12. ***The implied shifts in emphasis by policymakers over the cycle are consistent with the Fed’s mandate.*** The Federal Reserve has a dual mandate of ensuring price stability and full employment. In expansionary periods, the results suggest that the preservation of price stability becomes the focus of policy, and that a greater weight is given to interest rate smoothing. In recessions, by contrast, a greater weight is attached to restoring full employment and avoiding more detrimental outcomes, and the Federal Funds target tends to be moved more aggressively.

C. Implications

13. ***The results of this paper suggest that the Fed operates in an asymmetric manner depending on the cyclical state of the economy.*** These shifts appear to occur in a way consistent with the Fed’s dual mandate, and with the Fed’s risk-management approach to policymaking. This behavior is consistent with nonlinear models of the inflation-output tradeoff (the Philips curve). In periods when the economy is expanding, a change in nominal demand will show up relatively more in inflation than real output, justifying a greater focus on inflation in these circumstances. The opposite holds for recessions. In addition, the shorter

duration of recessions suggests that interest rate smoothing may be less relevant.⁶⁶ However, a nonlinear policy response could also reflect asymmetries in risks and/or assessments of costs of deviating from desired values.

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⁶⁶ For evidence on the nonlinearity of the Phillips Curve in the U.S., see Laxton, Rose and Tambakis (1999). Phillips (1958) also pointed at a convex curve when analyzing the relationship between the wages and unemployment in the U.K.

Woodford, M., 2003, *Interest and Prices: Foundations of a Theory of Monetary Policy* (Princeton: Princeton University Press).

VI. U.S. LARGE COMPLEX BANKING GROUPS: BUSINESS STRATEGIES, RISKS, AND SURVEILLANCE ISSUES⁶⁷

1. ***The growth of large U.S. bank holding companies (BHCs) has continued steadily in recent years, driven largely by mergers and acquisitions, advances in technology, and regulatory reforms.*** In particular, the Gramm–Leach–Bliley (GLB) Act of 1999 provided new opportunities for BHC expansion by allowing banks, securities firms, and insurance companies to affiliate under a financial holding company structure.⁶⁸ At end-2003, total assets of the 20 largest BHCs amounted to \$5.6 trillion, equivalent to 64 percent of the aggregate for all BHCs or about 50 percent of GDP.

2. ***This paper analyzes the implications for financial soundness and surveillance of the activities of the largest bank holding companies.*** The results are based on a review of business strategies and balance sheet data of the 20 largest BHCs—henceforth referred to as large complex banking groups (LCBGs).⁶⁹ Notwithstanding recent record profitability, closer co-movements of financial soundness indicators, both among LCBGs and between LCBGs and other financial sectors, such as insurance, suggest that systemic exposure to common shocks may have increased over time. This finding supports the supervisory authorities' ongoing efforts to complement risk-focused supervision of individual LCBGs and large nonbank groups with surveillance at a *system* level.

A. Evolving Business Strategies and Financial Outcomes

3. ***During 2000–03, the recession and wide swings in asset prices drove significant shifts in LCBG balance sheets, including a generalized switch from corporate to household exposure.*** With considerable household wealth flowing out of the stock market and into savings accounts, LCBGs were in a position to curtail, relative to total funding, their recourse to more costly market financing while still expanding their balance sheets at an average annual rate of 12 percent. At the same time, LCBGs' stock of commercial and industrial (C&I) loans fell by 10 percentage points relative to total LCBG loans, driven by shrinking demand and some tightening of lending standards (Table 1). Much of the exposure was redirected to the market for mortgage-backed securities (MBS), in particular those issued by government-sponsored enterprises (GSEs) which confer particular advantages for

⁶⁷ Prepared by Gianni De Nicoló, Peter Hayward, and Ashok Vir Bhatia (MFD), with research assistance from Marianne El-Khoury. This paper greatly benefited from authorities' comments.

⁶⁸ As shown in a joint paper by the Federal Reserve and the U.S. Treasury (2003), BHCs have gradually expanded their securities underwriting, broker-dealing, and insurance agency activities, although concentration in the nonbank financial sector has remained broadly stable during 1999–2003. For a comparative perspective on consolidation in the U.S. banking industry, see Group of Ten (2001).

⁶⁹ The 20 largest BHCs comprise 16 U.S. firms and four subsidiaries of European banks. At end-2003, they accounted for 73 percent of BHC nonbank assets and virtually all BHC derivatives activity.

Table 1. Selected Indicators for Large Complex Banking Groups, 1999–2003
(Arithmetic means of ratios for individual LCBGs)

	1999			2003			Change 1999–2003						
	LCBGs by complexity			LCBGs by complexity			LCBGs by complexity			LCBGs by complexity			
	High	Medium	Low	High	Medium	Low	High	Medium	Low	High	Medium	Low	All LCBGs
Uses and sources of funds	(In percent of total assets)												
Securities	26.7	22.6	20.1	23.2	34.8	23.7	20.5	26.5	8.1	1.0	0.4	3.3	
Net loans and leases	38.0	57.1	68.1	54.2	30.8	55.6	66.8	50.8	-7.2	-1.4	-1.3	-3.4	
Noncore funding ¹	53.9	37.5	33.1	41.7	54.0	30.0	27.7	37.6	0.1	-7.5	-5.3	-4.1	
Derivatives	815.5	236.7	29.3	366.7	1136.9	670.8	55.9	618.7	321.4	434.2	26.6	252.1	
Securities portfolio ²	(In percent of total securities)												
MBS	15.7	43.7	61.2	40.0	25.9	53.9	62.9	47.3	10.2	10.2	1.7	7.2	
Private securities and trading assets	70.0	43.9	28.9	47.8	62.5	34.6	15.5	37.7	-7.5	-9.3	-13.4	-10.1	
Loan book	(In percent of total gross loans)												
Real estate loans	22.2	44.8	45.3	37.0	27.7	57.7	53.3	45.7	5.5	12.9	8.1	8.6	
C&I loans	33.0	34.3	26.5	31.1	17.7	24.2	21.0	20.8	-15.2	-10.1	-5.5	-10.3	
Noncurrent loans	(In percent of gross loans by account category)												
C&I loans	1.9	1.1	0.6	1.2	5.2	2.2	1.4	3.0	3.4	1.1	0.8	1.8	
Total	1.2	0.9	0.7	0.9	1.7	1.3	0.9	1.3	0.5	0.4	0.2	0.4	
Net charge-offs	(In percent of average gross loans by account category)												
C&I loans	1.0	0.5	0.4	0.6	2.9	1.6	1.1	1.9	1.9	1.1	0.7	1.2	
Total	0.6	0.6	0.5	0.5	1.1	0.7	0.6	0.8	0.5	0.2	0.1	0.3	
Derivatives portfolio	(In percent of total derivatives)												
Interest rate contracts	70.5	80.2	88.9	79.8	75.2	90.2	90.3	85.0	4.7	10.0	1.4	5.1	
Foreign exchange contracts	26.3	15.9	10.7	17.7	20.3	6.9	9.2	12.4	-6.0	-8.9	-1.6	-5.3	
Credit derivatives	0.6	1.5	0.0	0.7	1.2	1.4	0.2	0.9	0.5	-0.1	0.2	0.2	
Income and expenses	(In percent of total gross income)												
Net interest income	21.4	30.7	36.5	29.5	25.2	38.8	43.7	35.8	3.8	8.1	7.2	6.3	
Noninterest income	39.5	27.6	24.2	30.6	48.1	37.1	31.1	38.8	8.6	9.5	6.8	8.3	
Operating expenses	41.4	36.9	35.9	38.1	52.7	48.1	44.1	48.3	11.3	11.2	8.2	10.2	
Profitability	(In percent of average assets)												
Net income	1.30	1.36	1.60	1.42	0.97	1.29	1.49	1.25	-0.32	-0.06	-0.12	-0.17	

Sources: Federal Reserve, *Bank Holding Company Performance Reports*.

Box 1. Regulatory Implications of LCBG's GSE Debt Holdings

The rapid growth of LCBG's holdings of GSE securities has been driven by risk management considerations as well as regulatory incentives. LCBGs either swap conforming residential mortgages (which carry a 4 percent capital requirement) for the standardized mortgage pools issued and guaranteed by Fannie Mae and Freddie Mac (1.6 percent capital requirement) for a fee, or buy mortgage-backed securities (MBSs) outright. By accepting a marginal reduction in interest income, LCBGs replace claims on discrete households (mortgages) with possibly better diversified and more liquid instruments (MBSs), reducing risk and freeing up capital.

Legislative, regulatory, and credit rating actions affecting GSE securities might have important consequences for LCBG regulatory capital and could entail market risks. Although the indentures for Fannie Mae and Freddie Mac debt explicitly disclaim a sovereign guarantee, the issuers are unique in that they were created and chartered by Acts of Congress. Both direct obligations and MBSs issued by the two GSEs receive risk weightings of 20 percent, are exempt from concentration limits, and are supported by the Secretary of the Treasury's legal authority to purchase up to \$2.25 billion of each issuer's bonds. If reforms were implemented to render the two issuers indistinguishable from other private corporations (including a reclassification of their securities for regulatory purposes), their direct obligations would become subject to a risk weight of 100 percent and a concentration limit of 10 percent of capital and surplus. In addition, if the debt ratings on MBSs issued by the two institutions were to be downgraded to below 'AA-' (while remaining in the investment grade range), these MBSs would become subject to a risk weight of 50 percent and a concentration limit of 25 percent. With LCBG holdings of GSE securities generally well in excess of such limits, the above scenario would require firms to hold additional capital and reduce their holdings of Fannie Mae and Freddie Mac securities.

LCBGs are slightly less sensitive to the regulatory treatment of GSEs than other deposit-takers. At end-2003, the 16 U.S.-based LCBGs held an average 37 percent of GSE direct debt relative to capital and surplus, and GSE-issued MBSs worth an average 94 percent. A re-weighting of GSE direct debt to 100 percent and GSE-issued MBSs to 50 percent would, *ceteris paribus*, reduce the weighted average risk-based capital ratio of these LCBGs by 56 basis points, compared with an estimated 87 basis point decline for all commercial banks and thrifts. Aggregate LCBG capital requirements would increase by \$14 billion, equivalent to one-fifth of aggregate net income in 2003.

Sources: Board of Governors of the Federal Reserve System (2003) for regulations; Frame and White (2004) for general issues; Kulp (2004) for stress tests on commercial banks and thrifts; Fund staff estimates for LCBGs.

computing risk-weighted capital adequacy (Box 1). By end-2003, LCBGs held nearly half of their investment account portfolios in MBSs issued by GSEs.⁷⁰

4. ***LCBGs have, however, pursued different business strategies in recent years, reinforcing the heterogeneous nature of this group.*** The most complex LCBGs—i.e., those

⁷⁰ For analysis of recent supply and demand developments in C&I credit, see Bassett and Zakrajšek (2003). For an evaluation of vulnerabilities arising from current exposures to residential and commercial real estate, see Collier, Forbush, and Nuxoll (2003).

most engaged in nontraditional banking activities—have become even more complex.⁷¹ For these firms, the switch to securities was most pronounced, as was the emphasis on trading and fee-generating activities. In contrast, medium-to-low complexity firms tended to focus more on core banking business, maintaining relatively large loan books and relying more heavily on retail deposits. However, while typically starting out with larger real estate exposures, some of these institutions have been even more aggressive in expanding their mortgage books and MBS portfolios than more complex LCBGs.

5. ***In particular, the dominance of the more complex institutions in the derivatives market has increased, including in the small but rapidly growing credit derivatives segment.*** The average ratio of derivatives contracts (measured by notional underlying values) to assets more than doubled in 2000–03, with most of the activity concentrated among eight market-making LCBGs. Reflecting in part the rapid growth of MBS holdings and the need to hedge the attendant interest rate risk, the average share of interest rate contracts rose at the expense of foreign exchange contracts. LCBGs also appear to have acquired some credit protection through a small but growing positive net position in credit default swaps and other credit derivatives.

6. ***The most complex LCBGs reported weaker financial results through the 2001 recession than their less complex peers.*** Reflecting a spate of bankruptcies at large firms, including Enron and WorldCom, noncurrent C&I loans more than doubled to 3.7 percent of total loans around the 2001 recession. Although the more complex LCBGs have held a smaller share of loans relative to other assets, they have maintained closer lending relationships with large corporate clients—including in the high-technology sector—and suffered larger asset quality deterioration as a consequence. With higher average operating costs to total income, returns on assets were typically lower at the most complex institutions, although the group of LCBGs as a whole maintained record profitability, outperforming most other large financial institutions in industrialized countries in the last five years.

7. ***This outcome would suggest that attempts at diversifying income and funding have not necessarily benefited the more complex institutions.*** Diversification at such institutions has come at the cost of a larger exposure to financial shocks, including from the equity

⁷¹ Asset measures may not adequately capture the actual size of financial institutions' activities. Therefore, for the purpose of this chapter, each institution's complexity ranking is calculated as a simple average of its rank order according to six measures of nontraditional banking activity (as a share of total assets unless otherwise indicated): assets associated with nonbank activities; notional value of derivatives contracts; the sum of private investment securities and all trading securities; noninterest income (as a share of gross interest and noninterest income); net loans and leases (ranked in inverse order); and core deposits (inverse order). For analytical purposes, the seven highest-ranked institutions are referred to as LCBGs of "high complexity", the next six as "medium complexity", and the last seven as "low complexity". The complexity ranking is only partially correlated with a ranking by asset size, with a rank correlation coefficient of 0.63 in 1999 and 0.55 in 2003. For a review of measures of financial institutions' size, see Samolyk (2004).

market, explaining much of their weaker financial performance relative to less complex LCBGs.

B. Financial Soundness

8. ***The business strategies pursued by LCBGs have implications for the financial soundness of both individual institutions and the group as a whole.*** Diversification across business lines and regions, as pursued by LCBGs in recent years, in principle dilutes risks. However, if this comes at the expense of reduced profitability, increased earnings volatility, or a thinning out of capital, overall financial soundness can still deteriorate. With linkages to financial markets increasing, the performance of the more complex LCBGs during the recent downturn provides an example of a type of diversification, specifically into equity market exposure and special purpose vehicle-finance for large firms, that has failed to improve financial results relative to other business strategies. However, the implications for financial soundness need to be judged over a longer period.

9. ***This chapter's analysis of financial soundness trends is based on a composite measure widely used in the literature.*** The so-called distance-to-default ratio (DD) is based on market measures of a company's profitability and balance sheet structure.⁷² The DD varies positively with returns on assets and capitalization and negatively with the volatility of assets, and its level can be mapped into a proxy measure of probability of insolvency. Thus, any increase in DD indicates improved financial soundness—reflected in a lower probability of insolvency—resulting from higher expected profitability, better capitalization, lower asset volatility, or a combination of these factors. DD measures for the LCBGs are subject to large fluctuations, however, which tend to be associated with the business cycle and “expectation cycles” regarding future earnings prospects. Expectations can be influenced, for example, by merger events (many acquisitions occurred in the early to mid-1990s) or periods of market disturbance (such as the LTCM failure and liquidity squeeze in 1998).

10. ***The analysis also suggests that LCBGs' business strategies, including diversification, have not translated into improved individual risk profiles over the last 15 years.*** For the 16 U.S.-based LCBGs, the (unweighted) average DD exhibits a slightly declining trend, indicating that risk reduction achieved through diversification has been offset by either higher risk-taking or lower risk-adjusted profitability (Figure 1).⁷³ This finding is

⁷² The distance-to-default ratio is computed as the sum of the return on the estimated market value of assets and the capital-to-assets ratio at market prices, divided by the volatility of assets. Estimates of the market value of assets are based on the structural valuation model of Black and Scholes (1973) and Merton (1974), and were computed using the estimation procedure described in Vassalou and Xing (2004) using daily market and annual accounting data. Although distance-to-default-type measures are sensitive to variations in the underlying assumptions, they have been shown to predict supervisory ratings, bond spreads, and rating agencies' downgrades (Krainer and Lopez, 2001; Gropp, Vesala, and Vulpes, 2002; Chan-Lau, Jobert, and Kong, 2004).

⁷³ Market and accounting data for the 16 U.S.-based LCBGs for the period 1989–2003 cover only those institutions that were in existence at end-2003.

consistent with other studies that have failed to find net risk-diversification benefits among large financial institutions in the United States and other countries in the 1990s.⁷⁴

11. *Nevertheless, the LCBGs weathered the 2001 recession better than the 1991 recession.* Although the 2001 recession was milder than in 1991, it occurred against a

background of severe financial shocks, including the stock market adjustment and a number of large corporate and sovereign defaults, all of which directly affected LCBGs. Despite this, the LCBGs' average DD declined much less than it did around the time of the 1991 recession. Stronger capital positions going into the recession appear to have played a key role, as did improved risk management, including through better risk-based pricing and (possibly) increased recourse to credit derivatives.⁷⁵

12. *However, financial soundness indicators for the more complex LCBGs have on average been lower than for their less complex peers.* For most of the last 15 years, the difference between LCBGs' unweighted and complexity-weighted average DDs has been negative, indicating that financial soundness has been weaker among firms that are more complex (Figure 2). Moreover, the gap between the two measures widened

whenever average financial soundness deteriorated, for example, during economic downswings. Firm-by-firm DDs also highlight that financial soundness of more complex firms tends to suffer more during recessions, notwithstanding the significant improvements made since the 1991 recession (Figure 3).

Figure 1. LCBGs' Average Distance-to-Default

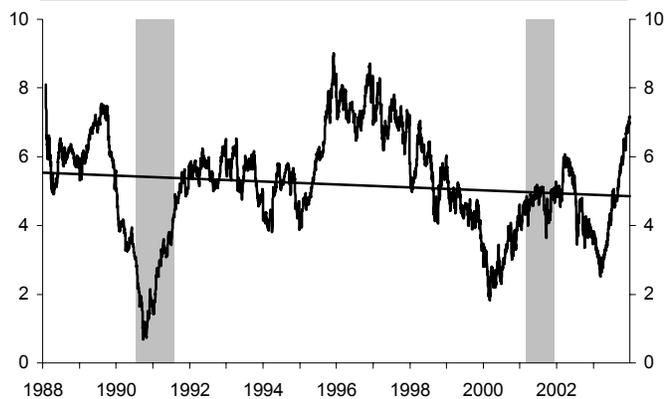
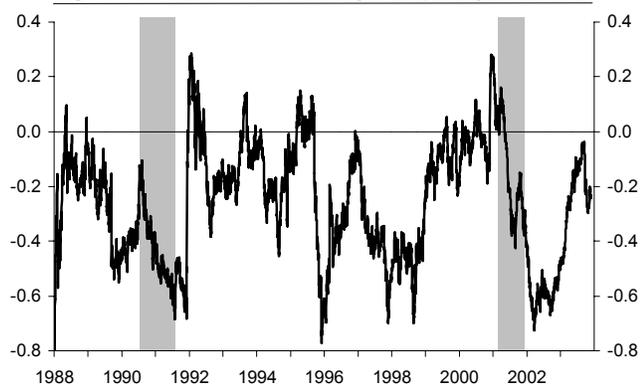


Figure 2. Risk Concentration by Complexity



⁷⁴ See Schuermann (2004), Walter (2003), De Nicoló and others (2003), Group of Ten (2001), and De Nicoló (2000).

⁷⁵ DD ratios may suffer from a downward bias caused by the asymmetric accounting treatment of credit derivatives. Because credit derivative gains and losses flow through trading income, they tend to make trading results more volatile, leading to wider swings in stock prices and, *ceteris paribus*, a smaller DD. Credit derivative results do not flow through to allowances for loan and lease losses.

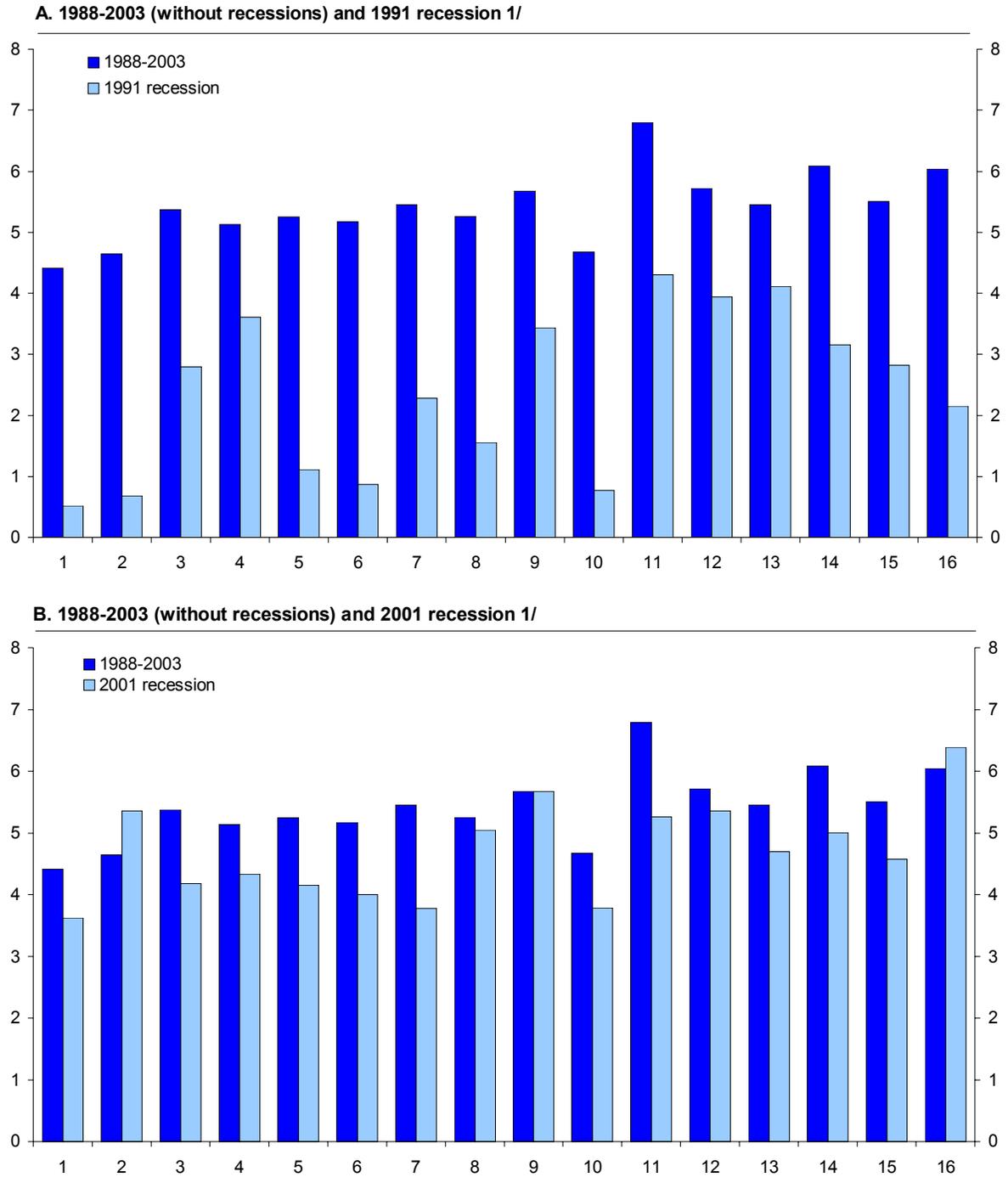
13. ***The evidence also points out that LCBGs' exposure to common shocks has increased.*** The “system” DD for the set of LCBGs, obtained as the DD of the portfolio composed by all LCBGs, captures the likelihood that a shock hits all firms contemporaneously. It has declined over the past 15 years, owing to a combination of lower DDs for some firms and closer co-movements of DDs (Figure 4, upper panel). The increasing co-movement of DDs is further illustrated by the clear downward trend in the difference between the system DD, which embeds all correlations among DDs, and the average of LCBGs' individual DDs, which does not embed such correlations (Figure 4, lower panel). As a result, diversification of the LCBG group as a whole appears to have decreased.⁷⁶

14. ***Finally, an analysis of sectoral financial soundness measures suggests that risk profiles of LCBGs and the insurance sector have become more similar, but remain distinct from those of investment banks.*** Between 1994-2003, the system DDs of the insurance and investment bank sectors exhibit a declining trend, similar to the group of LCBGs, although all sectors show improvements beginning in 2003 (Figure 5). Recently, the co-movement between the DDs of the LCBG system and the insurance sector appears to have become stronger, with the contemporaneous correlation increasing to 0.92 in 1999–2003 from 0.77 in 1994–98. By contrast, the co-movement between the DDs of the LCBG system and the investment bank sector appears to have become weaker, given the decline in their contemporaneous correlation to 0.36 in 1999–2003 from 0.44 in 1994–98. This finding points to greater exposure to common sources of risk for LCBGs and insurers, as well as some risk transfer from these sectors to investment banks.

15. ***In sum, although capital strength and improved risk management have served LCBGs well over the current cycle, systemic risks do not appear to have necessarily declined.*** Greater exposure to common shocks and changing interdependencies in financial soundness across sectors are potential sources of vulnerability that require supervisors to take a broader view of the financial system.

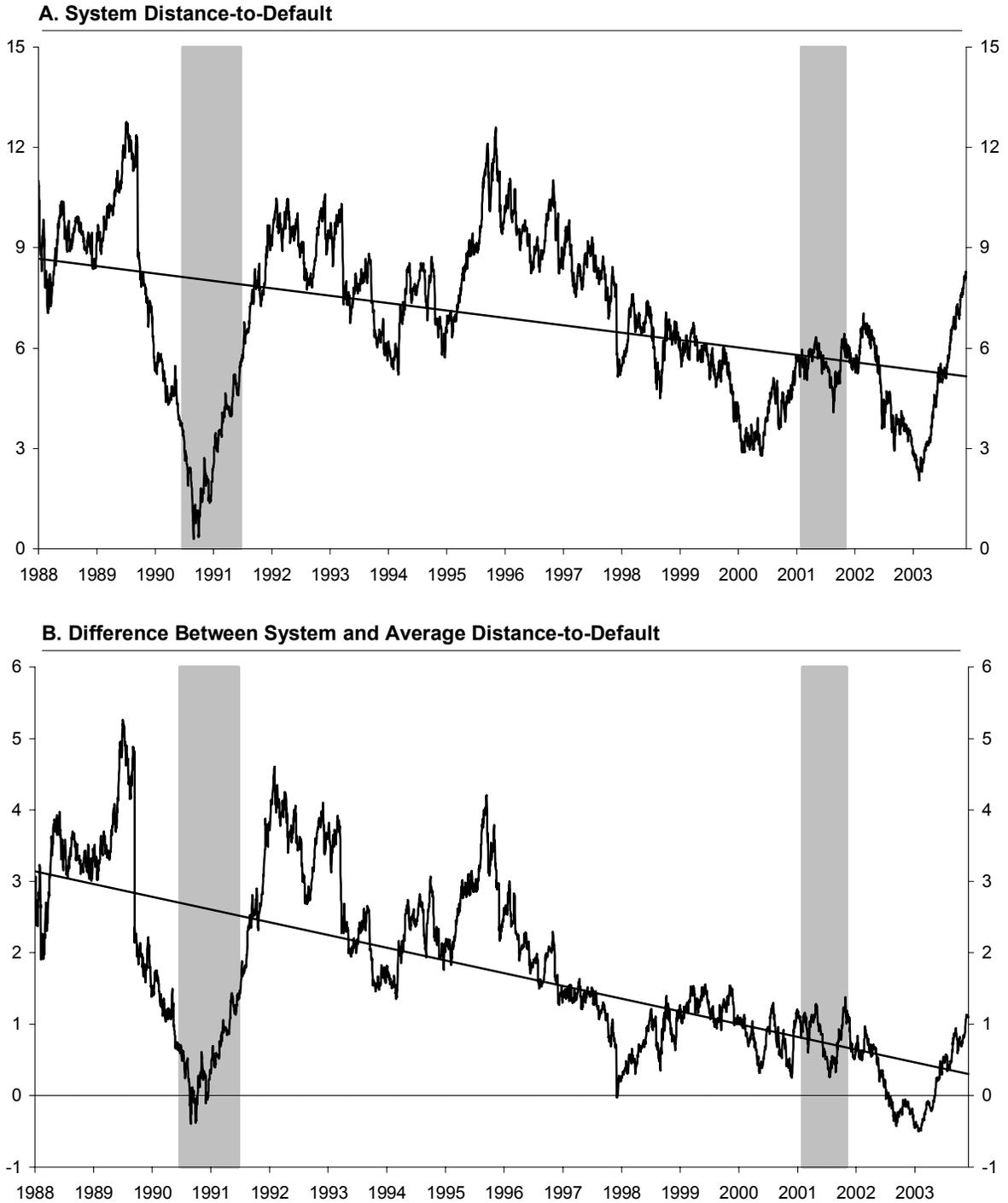
⁷⁶ These results are consistent with those obtained by De Nicoló and Kwast (2002). It should be noted that increased diversification of individual institutions in a group does not mechanically imply lower diversification of the group as a whole. As is clearly pointed out by Haubrich (1998), banks diversify by growing—i.e., by adding risks—which is very different from the *subdivision* of risk typical of a portfolio choice.

Figure 3: Average Distance-to-Default During Recessions



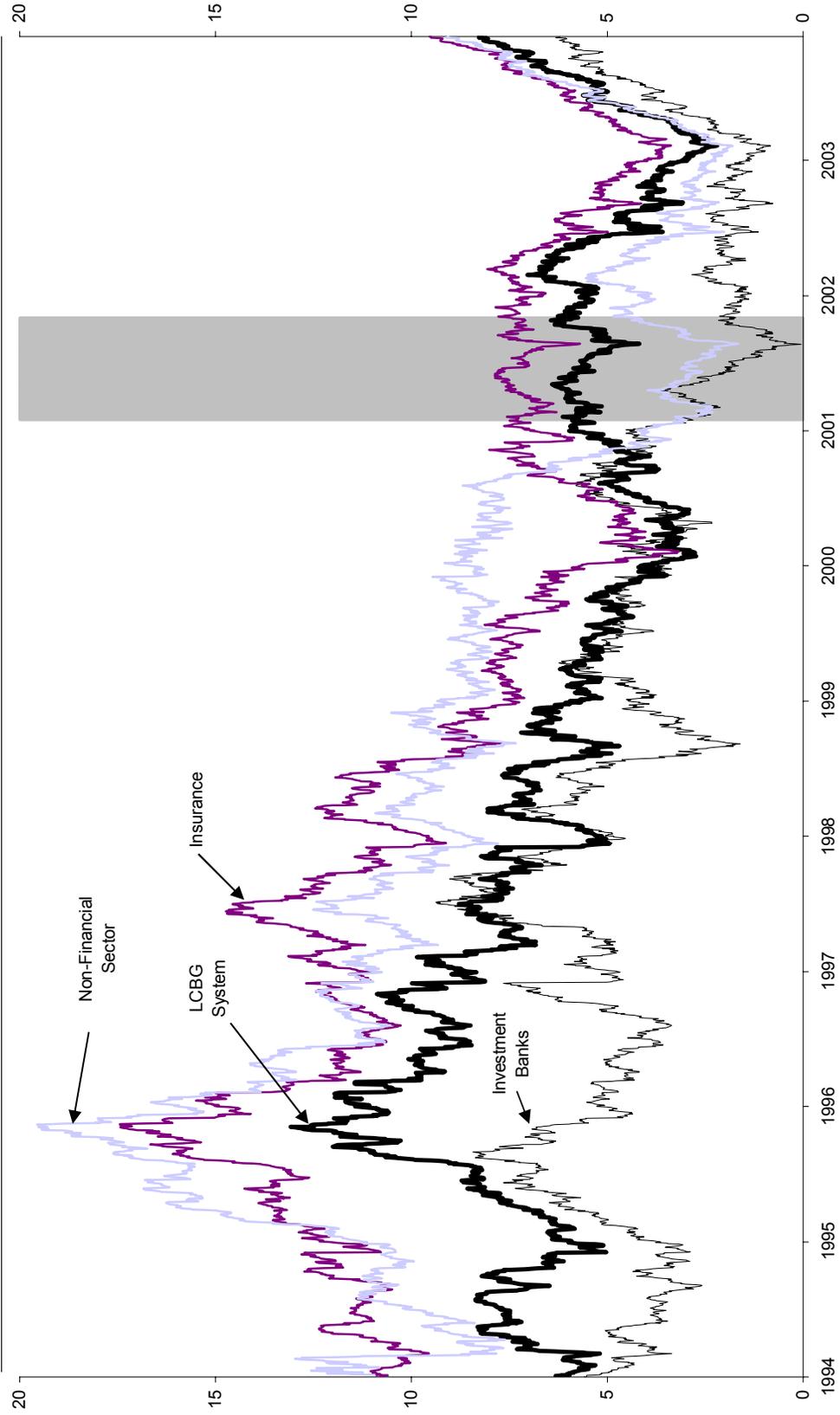
Source: Fund staff calculations.
 1/ LCBGs are ordered by decreasing complexity.

Figure 4: Distance-to-Default of the LCBG System



Source: Fund staff calculations.

Figure 5. Sectoral System Distance-to-Default



Source: Fund staff calculations.

C. Surveillance Issues and Supervisory Responses

16. ***The foregoing analysis supports intensified financial surveillance of LCBGs and systemically important nonbank groups at a system level.*** Supervisory assessments would need to include efforts to understand the systemic implications of risk management systems and instruments, and to identify critical factors for the liquidity of markets in which hedging instruments are traded.⁷⁷ Financial surveillance of systemically important institutions, such as LCBGs and large nonbank groups, the continuous monitoring of the functioning of the markets in which they operate, and market discipline are likely to become even more important as financial innovation progresses and conglomeration intensifies.

17. ***Encouragingly, financial system surveillance has strengthened in recent years.*** Greater emphasis is being placed on studies of key market segments and risk transfer systems. Large bankruptcies such as that of Enron have brought structured-finance practices into focus, with the Federal Reserve, the Securities and Exchange Commission (SEC), and the Office of the Comptroller of the Currency (OCC) launching a joint study of the 11 most active structured-finance firms (five investment bank holding companies, three U.S.-based BHCs, and three foreign-controlled BHCs), culminating in the recent issuance of structured-finance guidance for banking and securities firms. The Federal Reserve is also studying liquidity issues in the derivatives market, which it regards as central to efficient risk management. Such work is likely to inform policy responses in potential episodes of market instability such as the one associated with the collapse of LTCM in 1998. Importantly, the implementation of Basel II is being used as a key vehicle to strengthen banks' risk management systems and improve market discipline.

18. ***Traditional efforts by U.S. regulators to ring-fence insured depository institutions have increasingly given way to a new emphasis on risk-focused supervision of BHCs.*** The stated objective of risk-focused supervision is to ensure that the holding company does not threaten the viability of its insured depository institution subsidiaries or affiliates. There has been a gradual policy shift away from the dependence on legal protection provided by the holding company structure toward emphasis on internal risk management and market discipline (Box 2). The move away from a reliance on “firewalls” between the subsidiaries and affiliates of a holding company and toward “umbrella” supervision of BHCs by the Federal Reserve—a key provision of the GLB Act—as well as recent proposals by the SEC for the consolidated supervision of investment banking groups are motivated precisely by the

⁷⁷ With reference to the burgeoning credit derivative market, Duffie (2004) has stressed that financial institutions “managing portfolios of credit risk need an integrated model, one that reflects correlations of defaults and changes in market spreads. Yet, no such model exists.... This is one area of finance where our ability to structure financial products may be running ahead of our understanding of the implications.”

Box 2. The U.S. Regulatory Structure: A Bird's-Eye View

The U.S. regulatory structure is unique in that it offers a great deal of choice to the financial firm as to how, and by whom, it is being supervised. Commercial banks may opt to be chartered and regulated at the national or state level—and in the latter case may choose whether to become a member of the Federal Reserve System or not—and can opt to change their charter. For nationally-chartered banks, the primary supervisor is the OCC; for insured state-chartered banks that are members of the Federal Reserve System, it is the Federal Reserve and the respective state; and for insured state-chartered banks that are not members of the Federal Reserve System, it is the Federal Deposit Insurance Corporation (FDIC) and the respective state. States retain exclusive purview over insurance companies and some supervisory rights over investment firms (few states other than New York exercise the latter). There has also been a traditional functional split in the regulation of bank and nonbank financial intermediaries, and an absence of regulation of those sectors not considered to pose risks for depositors and retail investors. Most securities firms that trade on recognized exchanges are regulated by the SEC which, in turn, delegates much of the day-to-day responsibility to recognized exchanges that act as self-regulating organizations.

The supervisory philosophy places considerable emphasis on internal risk management and focuses increasingly on market discipline. Weak banks, including fairly large regional banks, tend to be absorbed by healthy banks or are allowed to fail—a key disciplining factor. Four private credit rating agencies that are classified by the SEC as “nationally recognized statistical rating organizations” play prominent roles, including by providing ratings benchmarks for regulatory capital requirements. They also serve as key sources for the analysis of large structured-finance transactions, which have surged in volume and complexity in recent years. Partly to counter too-big-to-fail or too-complex-to-fail perceptions, the Federal Reserve in early 1999 initiated a large complex banking organization (LCBO) program, which provides continuous supervision of large domestic or foreign BHCs that have particularly complex operations and dynamic risk profiles, focusing on both firm-specific and common risks. As discussed by DeFerrari and Palmer (2001), the LCBO program, which includes daily information exchanges between the Federal Reserve, the OCC, and other agencies, has served as the principal vehicle for consolidated supervision of BHCs in the United States, and has adapted and evolved with experience and changing circumstances.

increasing interdependency between financial soundness profiles of financial firms of the type documented above.⁷⁸

19. *Although risk-focused supervision of BHCs involves a large number of agencies, there is little evidence that supervisory procedures are more effective when implemented under more centralized structures.*⁷⁹ In the aftermath of the GLB Act, the Federal Reserve

⁷⁸ Within an LCBG, for instance, although the deposit-taking subsidiary may be protected in a balance sheet and legal sense, it may not be immune to reputational and operational risks emanating from a distressed nonbank financial affiliate, nor to the potential for conflicts of interest. For this and other reasons, the Federal Reserve insisted upon, and won, consolidated supervisory powers over any financial group that includes a U.S.-chartered commercial bank.

⁷⁹ In recent years, several countries have moved toward more centralized supervisory systems. Yet, there is no consensus on a uniform best model; most models have not been tested in stress periods; and even apparently similar centralized supervisory systems conceal important differences—as exemplified by the comparison of the United Kingdom and the Dutch models conducted by Kremers, Shoenmaker and Wierts (2003).

led the formation of a cross-sectoral group of BHC supervisors, including the OCC, the Federal Deposit Insurance Corporation (FDIC), the Office of Thrift Supervision, the state banking supervisors, the SEC, and the National Association of Insurance Commissioners. Convening roughly twice a year, the group has entered into a number of information-sharing protocols.

20. ***SEC supervision of investment banks until recently remained confined to registered broker-dealers as opposed to holding companies and unregistered affiliates.*** While the GLB Act lays down the supervisory ground rules for any group that includes a commercial bank, an important gap in the consolidated supervision of investment bank holding companies has recently been filled. In an effort to meet EU requirements that all large complex financial institutions operating in the EU be subject to consolidated supervision, the SEC is proposing a measure of capital relief for securities firms in exchange for agreement to submit to consolidated supervision, including inspections of holding companies and the imposition of a consolidated capital requirement. Similar to that planned for commercial banks under Basel II, the capital regime would afford large securities firms the option of using a model-based alternative to the traditional net capital rule, subject to SEC approval of internal risk management processes. Business penalized by the traditional net capital rule would likely migrate from unregulated affiliates to registered broker-dealers as a result. Details remain to be clarified, however, on the extent to which the SEC's approach will be consistent with that of the Federal Reserve with respect to BHCs.⁸⁰

21. ***Overall, the U.S. supervisory approach appears well advanced, with future reforms likely to focus on continuing adaptation and evolution rather than radical change.*** The interagency model with the Federal Reserve as lead supervisor of BHCs appears generally effective, although coordination and wind-down procedures have yet to be tested in a stress period. It is too early to assess whether the SEC will be effective in applying a similar degree of oversight to the investment banking groups. Although the Federal Reserve has not taken a position on the need for a federal insurance supervisor, the dispersion across states of insurance regulatory standards is an issue that may warrant attention, especially given additional evidence that the insurance sector has taken on some risk from other sectors (IMF, 2004). As financial innovation and interdependencies across institutions and markets progress, similarly important may be the task of exploring ways to strengthen and clarify the power and scope of the lead supervisors.

⁸⁰ For example, the SEC does not intend to apply a leverage ratio, which the Federal Reserve still uses for the LCBGs.

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VII. U.S. TRADE WITH CHINA: TRENDS AND POLICIES⁸¹

1. ***This chapter analyzes recent trends in U.S.-China bilateral trade and policies.*** It suggests that the rapid growth of U.S. imports from China has largely displaced other foreign suppliers, with limited impact on the U.S. manufacturing sector. U.S. exports to China have also risen rapidly, but remain much smaller than corresponding imports. Although concerns have been raised in the United States over increased competition from Chinese producers, U.S. trade policy has focused mainly on enhancing U.S. market access in China and encouraging implementation of China's WTO commitments. By contrast, U.S. resort to defensive trade remedies has been relatively restrained.

A. The Impact of Trade with China

2. ***U.S. imports from China have grown rapidly, and Chinese producers have captured an increasing share in the U.S. market*** (Table 1). Since 1998, imports of goods from China have grown at an average annual rate of 17 percent, compared to a 7 percent growth rate for total imports. As a result, China's market share in U.S. goods imports has risen by half—from 8 percent to 12½ percent—and the share of U.S. consumer goods provided by China has doubled from slightly above 2 percent to 4 percent during the same period.⁸² This growth has been concentrated in a relatively small number of product categories, particularly electronics and textiles.⁸³

Partner Country		Imports	Exports	Trade Deficit
		Billions of U.S. dollars		Percent of GDP
China	1998	75.1	14.3	-0.7
	2003	163.3	28.4	-1.2
	Rate of growth ¹	16.8	14.8	...
World	1998	944.6	680.4	-3.0
	2003	1,305.2	723.2	-5.3
	Rate of growth ¹	6.7	1.2	...

Sources: BEA; Fund staff calculations.
¹ In percent.

3. ***The expansion of China's U.S. market share has been accompanied by a significant drop in Japan's share.*** This decline appears to at least partly reflect a shift within

⁸¹ Prepared by Katerina Alexandraki.

⁸² For analytical purposes, this paper has used U.S. sources for trade data. These differ from bilateral trade data produced by China largely due to the inclusion of entrepôt trade through Hong Kong into imports from China.

⁸³ Together, computer equipment, apparel, household goods and toys, furniture, appliances, and television receivers, as well as business, telecommunications, and photographic machinery, have contributed to well over half of China's gains in U.S. market share over the last five years.

Asia of export-oriented, labor-intensive production to China.⁸⁴ Other exporters in the region have maintained more stable market shares, but there have been significant reductions in specific products. For example, Korea lost trade shares in computers and telecommunications equipment, possibly reflecting the increasing prevalence of “triangular” trade flows in East Asia, with China the location for the manufacturing or assembly of inputs originating in neighboring economies.⁸⁵ In the case of Mexico, recent declines in its exports of auto parts, electronic equipment, and some textiles categories to the United States may also reflect competition from China.

4. ***The standard “constant market share” approach is used to analyze the extent to which Chinese imports have displaced other foreign and domestic producers.*** This approach involves decomposing the growth of aggregate imports in the following manner:

$$\hat{M}_{US} = w_{CH}\hat{M}_{US} + \hat{w}_{CH}M_{US} + w_{RoW}\hat{M}_{US} + \hat{w}_{RoW}M_{US}, \quad (1)$$

where M_{US} are aggregate U.S. imports, w is the market share of China (CH) and the rest of the world (RoW) in the U.S. market, respectively, and hats represent rates of change relative to a chosen benchmark period. The approach assumes that if the competitiveness of all trading partners were to remain unchanged over a period, their market shares would also stay unchanged. Relative to the benchmark year, China’s gain from the rise in its import market share (which equals the displacement of other foreign producers in the U.S. import market) is equal to $\hat{w}_{CH}M_{US}$. Moreover, since it holds that

$$\hat{A}_{US} = \hat{w}_{us}A_{us} + w_{us}\hat{A}_{us} + \hat{w}_M A_{us} + w_M \hat{A}_{us} \quad (2)$$

where A_{US} is domestic absorption, and w_{US} and w_M are the shares of domestic and foreign-produced goods in domestic absorption, respectively, the impact on domestic producers can be calculated residually.

5. ***The analysis suggests that China’s rising market share has primarily displaced other foreign suppliers, while the impact on U.S. manufacturing has been limited.***⁸⁶ With 1993 chosen as the benchmark period, the results indicate that most of the \$80 billion increase in Chinese trade between 1998 and 2003 displaced goods provided by other foreign

⁸⁴ This is illustrated by the fact that the standard deviation of the combined share of Japanese and Chinese imports in the U.S. market was 1.1 as opposed to 3.9 for Japan and 3.3 for China separately.

⁸⁵ See Rumbaugh and Blancher (2004).

⁸⁶ The calculation is based on nominal as opposed to real trade statistics because deflators for Chinese exports are not available. This would lead to a downward bias in the results if prices of Chinese goods had been growing more slowly than those of U.S. goods and other foreign suppliers. On the other hand, the formula ignores second order interactions which in this case would tend to overstate the impact—approximating for such second-order effects reduces China’s displacement by around \$5 billion.

suppliers (worth around \$70 billion), with domestic producers losing around \$10 billion (slightly less than 0.1 percent of GDP) in sales (Table 2). A similar result has been found for the 1993–1998 period (see Noland, 1998, and Hufbauer and Rosen, 2000, for comparable analysis using more disaggregated data over earlier periods).

6. ***This finding is supported by the lack of widespread sectoral evidence showing a detrimental impact of Chinese imports on U.S. manufacturing*** (Table 3). In the furniture and electronic goods sectors, for example, an increase in Chinese market share has occurred in tandem with rising domestic output, stable employment, and increasing real wages.

While employment and real wages have fallen in the textile and apparel sectors, Chinese imports have played a relatively small role because a substantial part of Chinese textiles have been subject to import quotas under the Agreement on Textiles and Clothing slated to expire in December 2004. By contrast, in the leather and shoe-producing sector, where domestic employment and real wages have also fallen, China accounted for the entire growth in U.S. imports. Like in the electronics sector, however, data limitations preclude an exact matching of domestic production and import data.

7. ***U.S. exporters have benefited from growing Chinese demand.*** Over the past five years, the value of merchandise exports to China grew by an annual average of 15 percent, compared with overall export growth of slightly over 1 percent per year.⁸⁷ More than one-third of this growth has been driven by four products—soybeans, cotton, organic chemicals and semiconductors—but other sectors have also benefited, including computer accessories, vehicle parts and telecommunications machinery.⁸⁸ U.S. exports of services to China have also grown rapidly, largely in education, professional services, and royalties and fees from the

	1993	1998	2003
	(In billions of U.S. dollars)		
U.S. imports of goods, fob	592.8	929.0	1,283.3
U.S. domestic absorption	2,520.7	3,391.5	4,137.6
Shares in U.S. consumption	(In percent)		
U.S. producers	76.5	72.6	69.0
China	1.3	2.2	3.9
Rest of the world	22.2	25.2	27.1
China's share in U.S. imports	5.7	8.1	12.7
Projected impact of Chinese trade on other producers ¹	(In billions of U.S. dollars)		
China's trade gains	0.0	30.0	108.2
<i>Of which :</i>			
Displacement of RoW suppliers	0.0	22.6	90.7
Displacement of US producers	0.0	7.4	18.0
(In percent of U.S. GDP)	0.0	0.1	0.2

Source: Fund staff calculations.
¹ Using 1993 as benchmark year.

⁸⁷ Intra-company trade appears to have accounted only for a small part of U.S. export growth to China. Data provided by the Bureau of Economic Analysis suggest that the share of intra-company sales in total U.S. exports to China has fluctuated between 7 and 14 percent since the mid 1990s. Only in 1999 did exports to affiliates appear to account for 23 percent of total exports to China.

⁸⁸ Hufbauer and Rosen (2000) argue that wages in export-oriented industries are, on average, 15 percent higher than those in import-competing industries. Therefore, the jobs created by exports to China may pay higher wages than equivalent import-competing sectors.

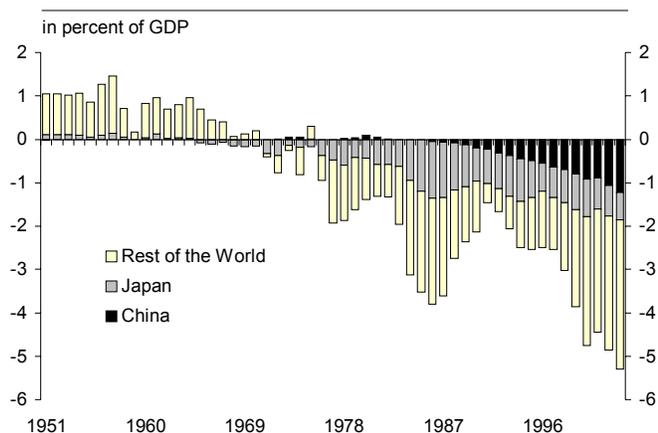
use of computer software. With services exports to China reaching \$6 billion in 2002 (equivalent to about one-quarter of goods exports), the United States runs a bilateral surplus of \$2 billion in the services trade.

	Real Output	Price Deflator	Employees	Salaries	Change in U.S. Market Share ¹ 1991-2001	
					Total Imports	Chinese Imports
Furniture and fixtures	16.1	47.7	1.4	62.9	19.4	13.6
Electronic and other electric equipment	521.2	-73.7	-8.6	77.2
Textile mill products	-6.2	16.8	-35.0	5.8	20.8	3.6
Apparel and other textile products	-15.3	19.5	-48.9	-8.7	24.6	3.7
Leather and leather products	93.0	32.6	-51.4	-8.7

Source: Fund staff calculations.
¹ In percentage points.

8. *Nevertheless, the overall U.S. trade deficit with China has risen to over one percent of U.S. GDP* (Figure 1). With exports and imports both growing rapidly, this largely reflects the fact that Chinese merchandise exports to the United States are almost six times the reciprocal flow. However, China's share in the U.S. trade deficit has stayed roughly constant since 1998, suggesting the possibility that the bilateral deficit with China may reflect the United States' broader saving-investment imbalance.⁸⁹

Figure 1. U.S. Trade Deficit with Partner Countries



Source: Bureau of Economic Analysis.

9. *U.S. manufacturers appear to increasingly prefer penetrating the Chinese market through foreign direct investment (FDI).* This seems to reflect a combination of “pull”

⁸⁹ Considerable attention in explaining China's export growth has also been paid to the role of trade barriers and exchange rate policy. For a discussion see, for example, IMF (2004).

and “push” factors, including strategic considerations by U.S. companies—reflecting China’s economic size and potential—as well as policies that encourage local production in sectors such as semiconductors, fertilizers, and automobiles, including differential tax treatment (USTR, 2004a). Sales of majority-owned U.S. affiliates in China reached over \$30 billion in 2001, close to double the amount of U.S. goods exports to China that year, and almost fifteen times the equivalent sales of Chinese affiliates in the United States. Indeed, U.S. affiliates’ sales rose by more than half in the past two years, reflecting both underlying demand growth in China and a trend rise in U.S. FDI, focused on computer and electronic products as well as electrical equipment and appliances.

B. U.S. Trade Policy Toward China

10. ***Market access for U.S. goods, services, and investment has been viewed as an integral component of U.S. trade policy vis-à-vis China.*** Following the normalization of trade relations in 2000 and China’s WTO membership in 2001—both of which have formed a part in the significant opening of China’s trade regime—a series of regular bilateral consultations has provided a framework for addressing market access issues.⁹⁰

11. ***A key U.S. interest has been to obtain access for agricultural goods*** (USTR, 2004b). U.S. concerns have centered on what is being perceived as an opaque application of sanitary and phytosanitary standards to commodities produced with the help of biotechnology, most notably soybeans, and possibly burdensome procedures for administering the tariff-quota (TRQ) system for bulk commodities such as wheat, corn, and cotton.⁹¹ Although difficult to quantify, the impact of such actions could potentially be significant, given that U.S. agricultural exports to China have reached nearly \$5 billion in 2003 and China is already the largest external market for U.S. soybean and cotton. Negotiations to resolve differences have been frequent, and progress has been made in certain areas. In February 2004, the Chinese government approved permanent safety certificates for the import of several biotechnology crops. China has also agreed to adopt U.S. proposals for labeling meat and poultry, and an agreement on China’s TRQ system is under negotiation.

12. ***Progress has been made in a number of areas concerning the services trade, including in the maritime sector, but important issues remain.*** In the case of financial services, while China has introduced some relevant legislation in this sector, remaining U.S. concerns have centered on China’s high capitalization requirements and the lack of transparency in the licensing of financial institutions (USTR, 2004b). Liberalization of the

⁹⁰ China’s average tariff was 12.3 percent in 2002, compared to 23.6 percent in 1996. Some outstanding market access issues, such as the pace of implementation of China’s trade liberalization commitments, or the case against its VAT-rebate policy for semiconductors, are currently being addressed at the WTO.

⁹¹ U.S. exporters have pointed to delays and a lack of transparency in TRQ allocations; delays in the naming of importing enterprises; evidence of discrimination between state and non-state trading enterprises; and the lack of automatic import licensing for these commodities.

Chinese insurance market is of key interest to the United States, with estimates suggesting potential turnover for U.S. companies could reach \$15 billion once the market was fully opened. In the area of trading rights and distribution services, concerns stem mainly from alleged delays in the implementation of China's liberalization schedule as per its WTO commitments.

13. ***The enforcement of intellectual property rights (IPRs) in China has also been a top priority of the United States.*** China's track record in complying with bilateral understandings on IPRs and enforcing relevant legislation has been criticized, and "Section 306" monitoring has been in force since 1996.⁹² The issue has taken on greater prominence in recent years, owing to the increasing export of China-made counterfeit products. In 2003, China accounted for two-thirds of all U.S. Customs and Border Protection seizures of IPR-infringing goods.⁹³

14. ***In April 2004, China committed to undertake a series of near-term actions to improve IPR enforcement.*** These include legislative reforms aimed at lowering thresholds for applying criminal sanctions for acts of IPR infringement and an active crackdown of counterfeit production, distribution and exports through inspections, higher penalties, stronger customs regulations and public awareness campaigns. In addition, China pledged to accelerate efforts to ratify and join the World Intellectual Property Organization (WIPO) Internet treaties and continue audits to enforce the use of legitimate software, including by local governments.

15. ***China has also been at the receiving end of U.S. contingent protection measures in recent years.*** China accounted for 15 percent of total outstanding U.S. antidumping (AD) orders and countervailing duties as of February 2004, and has been subject to considerable AD action by other countries (Table 4). The United States has also made use of a special textile safeguards clause under China's WTO accession agreement, albeit sparingly.⁹⁴ These actions have only

Table 4. Number of Antidumping Actions Initiated Against China (July 1-June 30)

	United States	EU	India	Other
1994 - 1995	7	3	3	14
1995 - 1996	3	6	2	19
1996 - 1997	4	3	2	22
1997 - 1998	1	5	4	17
1998 - 1999	3	4	4	10
1999 - 2000	2	11	3	10
2000 - 2001	11	3	13	25
2001 - 2002	7	3	12	24
2002 - 2003	7	3	13	19
Total	45	41	56	160

Source: Reports of the WTO Committee on Anti-Dumping Practices.

⁹² Section 306 monitoring implies that the USTR can move directly to the application of trade sanctions against China if there is a slippage in the enforcement of bilateral IPR agreements.

⁹³ According to the International Intellectual Property Alliance, losses from piracy in China could have exceeded \$1.5 billion in recent years (International Intellectual Property Alliance, 2002).

⁹⁴ This right was exercised for the first time in December 2003, when quotas were placed on imports of three textile products from China (brassieres, robes, knit fabric), following a determination that market disruption or a threat thereof existed for the domestic textile industry.

affected a small proportion of Chinese imports. However, contingent protection can create uncertainty regarding future trade relations and may impact on investment decisions. In addition, empirical evidence suggests that such actions are a relatively inefficient way of supporting domestic producers, given that trade can be diverted from named to non-named countries.⁹⁵

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⁹⁵ Prusa (1996) finds that non-named country imports rise by 22 percent in the first year of trade actions, with more trade diversion in high-duty cases. Two thirds of the AD cases involving China did not involve another country, while China's status as a "non-market economy" has typically translated into relatively high duties.