Volume 13, Number 2 ⁓ February 2007
FEDERAL RESERVE BANK OF NEW YORK
www.newyorkfed.org/research/current_issues

Current Issues IN ECONOMICS AND FINANCE

www.newyorkfed.org/research/current_issues

What Has Homeland Security Cost? An Assessment: 2001-2005

Bart Hobijn and Erick Sager

While homeland security is widely seen as an important national objective, the costs of this effort are not well understood. An analysis of public and private expenditures on homeland security shows that overall spending rose by $34 billion between 2001 and 2005—a clear increase but one that represents a gain of only ¼ of 1 percent as a share of U.S. GDP. Private sector expenditures increased very modestly in dollar terms and remained unchanged as a fraction of the sector's GDP.

Since the terrorist attacks of September 11, 2001, homeland security has become a key concern for the public and private sectors. Questions about the adequacy of existing security arrangements have prompted both sectors to adopt new policies as part of what the Office of Homeland Security (2002) calls "a concerted national effort to prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, and minimize the damage and recover from attacks that do occur."

Not surprisingly, the costs of this effort raise hard questions about U.S. resource allocation. Specifically, there is concern that large-scale spending on security could hold back economic growth by diverting labor and capital from more productive uses. In this edition of *Current Issues*, we shed light on this matter by quantifying the increase in resources spent on homeland security between 2001 and 2005 and evaluating the impact of this spending on overall U.S. economic activity and performance.

Our study is essentially an investigation of the cost side of a cost-benefit analysis for homeland security spending. We focus on only that side of such an analysis because estimating benefits is very difficult—involving, as it does, speculation about counterfactuals, or what *would* have happened if the spending had not taken place. Even with this narrowing of focus, however, accounting for homeland security costs is far from straightforward. While Congress has required the federal government to provide a detailed accounting of homeland security spending in the last five years, state and local governments do not systematically report similar outlays. Moreover, only very limited information is available on the amount of resources that the private sector has targeted to security, and even less on resources devoted specifically to *homeland* security.

Because of these data limitations, we document the change in homeland security costs in a series of steps. We begin by reporting federal government outlays on homeland security. We then review the available evidence on the private sector's security-related labor and capital expenditures, arriving at what are, at best, crude measures of the changes in this sector's spending over the 2001-05 period. Recognizing the weakness of these measures, we present some additional sector-specific information on security costs and consider whether there is macroeconomic evidence of significant security outlays by the private sector.

Our methodology, coupled with the limitations of our private sector measures, means that our estimates of homeland security costs are best thought of as an upper bound.

We estimate that homeland security spending climbed from $56.0 billion in 2001 to $99.5 billion in 2005. As a fraction of nominal GDP, these dollar amounts translate into a rise from 0.55 percent in 2001 to 0.80 percent in 2005. Increases in federal government spending account for $34.2 billion of the $43.5 billion rise in spending, while the remaining $9.4 billion is attributable to increases in private sector resources devoted to homeland security.

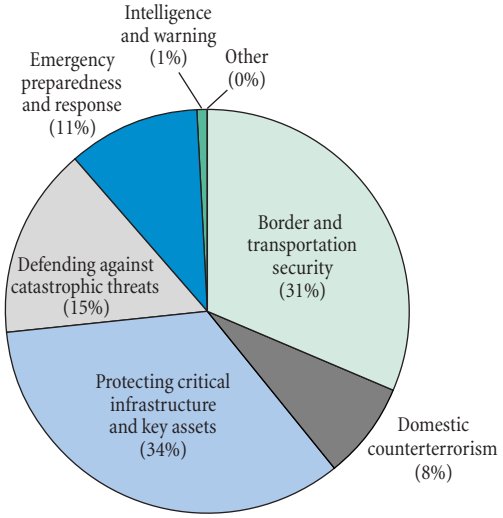
These numbers point to a relatively small increase in the share of resources targeted to homeland security in the post 9/11 period. Given this modest increase—as well as the robust economic performance of the U.S. economy since 2001—we conclude that the broader economic impact of higher security spending has been very limited.

Public Sector Spending on Homeland Security

The Office of Management and Budget (OMB) defines the homeland security effort as encompassing six main objectives: intelligence and warning, border and transportation security, domestic counterterrorism, protection of critical infrastructure and key assets, defense against catastrophic threats, and emergency preparedness and response. Chart 1 depicts the distribution of federal outlays over the six policy objectives in 2005. Border and transportation security and protection of critical infrastructure account for the preponderance of homeland security spending. At the other end of the spectrum, intelligence and warning constitutes, by far, the smallest fraction of the homeland security budget—largely because many intelligence expenditures do not fall directly under the classification and jurisdiction of homeland security.

As reported in the OMB's (2006) budget proposal for fiscal year[1] 2007, total federal outlays on these six policy priorities came to $54.3 billion in fiscal year 2005, an amount roughly equal to 0.4 percent of GDP. This share of GDP was twice as high as it was in 2001, when the $20.1 billion of federal homeland security spending represented about 0.2 percent of GDP. Current proposals for fiscal year 2007 include $58.3 billion in spending on homeland security, an amount that the Congressional Budget Office (CBO) projects to be 0.4 percent of GDP. In addition, the CBO projects that by 2015, homeland security spending will decline to 0.25 percent as a share of nominal GDP.[2]

Chart 1
Composition of Homeland Security Outlays, 2005



Source: U.S. Office of Management and Budget (2006).

To put these figures in a historical context, we turn to estimates from the Government Accountability Office (GAO) that shed light on homeland security spending in the years before and after 2001. According to the GAO estimates reported in Hobijn (2002), federal homeland security spending made up about 0.1 percent of GDP in the 1996-2001 period. This share increased to 0.35 percent in 2002 and has remained relatively stable since.

The GAO numbers provide insight into both the magnitude and timing of the increases in public sector security spending. Federal outlays grew substantially as a share of GDP in the year after the September 11 attacks. Since 2002, however, they have increased only modestly.

Unlike federal outlays for homeland security, state and local government expenditures are not systematically reported. Although detailed data are available on funds awarded to states and urban areas under the Department of Homeland Security's (2006) Homeland Security Grant Program (HSGP), these outlays are already accounted for in the federal homeland security spending numbers reported above.[3] Information about additional state and local government

[1] A fiscal year (FY) runs from October 1 through September 30. So, fiscal year 2007 runs from October 1, 2006, through September 30, 2007.

[2] See U.S. Congressional Budget Office (2006). This forecast is based on data that do not include the outlay numbers presented in U.S. Office of Management and Budget (2006).

[3] We were able to obtain data on security-related spending outside of the HSGP program for only two states. Data for the Vermont Homeland Security Unit (HSU) show a steady increase in grant provisions until FY 2005, when the state HSU reported its first decline in grant spending. For Vermont HSGP grants, a decline began in FY 2004. In Florida, overall domestic security spending also began to drop in FY 2004, and the state's HSGP grant appropriations declined beginning in FY 2005. In the case of both Vermont and Florida, homeland security spending has clearly followed a downward trend in recent years. Moreover, a pattern in which HSGP spending first rises and then falls has been documented for all states.

Protective Activities in the Private Sector

Labor: Protective Services Occupations[a]
Category 33 of the Standard Occupational Classification. Consists mainly of firefighters, police officers, correctional officers, private detectives, and security guards.

Capital: Electronic Security Systems[b]
Electronic access control, anti-burglary, closed-circuit television, fire protection, systems integration, and home automation.

[a]As defined in U.S. Department of Labor, Bureau of Labor Statistics (2005).

[b]As defined in Security Sales and Integration (2006).

spending on homeland security is sparse; consequently, we omit these expenditures from our analysis.

Private Sector Spending on Security

Estimates of the cost of homeland security require an assessment of private sector expenditures as well as government outlays. Unfortunately, current statistics do not identify which resources in the private sector are targeted specifically to *homeland* security.[4] We do have data, however, on the fraction of private sector resources devoted to the broader goal of security in general. These security-related resources are defined in our analysis as expenditures for protective services workers and electronic security systems (see box).[5] In this section, we consider how these labor and capital expenditures changed over the 2001-05 period.[6]

Labor

For our analysis of labor inputs, we report employment and earnings statistics for protective services workers as a group and for two subgroups, police officers and security guards. The statistics are presented for protective services workers in the economy as a whole and, separately, for those in the private, or business, sector.[7] Using these data, we can assess whether security-related labor inputs have increased in importance—in the total economy and in the private sector—over the 2001-05 period. We do so in two ways: first, by considering whether employment in protective services has grown as a share of total employment and, second, by considering whether the wages of protective services employees have increased as a fraction of the total wage bill.

Table 1 presents our main findings. From 2001 through 2005, U.S. employment increased from about 128 million to 130 million employees. Over the same period, the number of protective services employees in the total economy rose from 3.0 million to 3.1 million. Thus, the share of protective services employees in total employment has remained fairly constant at 2.3 percent. Moreover, the Bureau of Labor Statistics

Table 1
Employment and Earnings in Protective Services Occupations, 2001-05

	Total Economy			Private Sector[a]	
	2001	2005	2014	2001	2005
	Employment (Thousands)				
All U.S. employees	127,980	130,308	164,540	117,943	120,868
Protective services employees	2,958	3,057	3,578	1,227	1,203
Police officers	606	629	743	11	16
Security guards	996	994	1144	972	947
	Average Annual Earnings (Dollars)				
All U.S. employees	34,020	37,870	—	33,535	37,372
Protective services employees	32,530	35,750	—	21,586	23,830
Police officers	41,984	47,295	—	33,583	42,422
Security guards	20,460	22,690	—	20,349	22,468
	Percentage of Total Employment				
Protective services employees	2.31	2.35	2.17	1.04	1.00
Police officers	0.47	0.48	0.45	0.01	0.01
Security guards	0.78	0.76	0.70	0.82	0.78
	Earnings as a Percentage of Total Wage Bill				
Protective services employees	2.21	2.21	—	0.67	0.63
Police officers	0.58	0.60	—	0.01	0.01
Security guards	0.47	0.46	—	0.50	0.47

Source: U.S. Department of Labor, Bureau of Labor Statistics (2001, 2005, 2006a).

Note: Employment figures for 2014 are projections.

[a]Values for the private sector are based on data for the U.S. business sector.

[4]Identification of these resources might be impossible in practice, because firms themselves do not account for them and typically have no business reason to do so.

[5]Security-related expenditures in the private sector were similarly defined in Hobijn (2002).

[6]In the aftermath of the September 11 attacks, the *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System* (Board of Governors of the Federal Reserve System et al. 2003) identified best practices for minimizing the systemic effects of financial market disruptions and established time frames within which firms were expected to implement these practices. To meet these time frames, key firms were asked to establish geographically dispersed backup facilities in order to prevent a substantial shutdown of clearance and settlement operations in the case of a catastrophic event. While this request was aimed at financial firms, other firms may have acted on their own to create backup services. We do not have the data to quantify these backup costs directly, but in theory they are reflected in part by our private capital and labor cost estimates. However, because security spending constitutes only a fraction of the cost of setting up backup facilities, we do not capture the total cost. This limitation leads to an unfortunate downward bias in our overall estimate.

[7]In our analysis, we use business sector data to proxy for private sector data when necessary. The two sectors are largely equivalent, although the private sector includes nonprofit institutions while the business sector typically does not.

(2006a) expects this share to decline to 2.2 percent in 2014. In the private sector, where roughly 80 percent of protective services employees are security guards, the share of workers employed in protective services occupations has also held steady, at 1.0 percent in both 2001 and 2005.

The fact that the employment share of security workers has changed little does not necessarily mean, however, that the share of resources devoted to such workers has remained constant. For example, an increase in relative wages—presumably reflecting a rise in the qualifications of protective services workers—would boost the share of resources.

Nevertheless, we find that the hourly earnings of protective services workers have declined slightly compared with those of the average U.S. employee. Specifically, hourly earnings of U.S. protective services employees increased 9.9 percent between 2001 and 2005, in contrast to the 11.3 percent increase seen by the average U.S. worker. As a result, protective services employees accounted for roughly 2.2 percent of the U.S. wage bill both in 2001 and in 2005. In the private sector, moreover, protective services workers' share of the wage bill even fell slightly, from 0.7 percent to 0.6 percent.

Overall, the evidence suggests that the share of labor inputs devoted to protective services has not increased since the September 11 attacks. Moreover, the Bureau of Labor Statistics does not expect such an increase to occur in the next decade.

Capital

There are no official government statistics on how many capital goods are used primarily for security purposes. Thus, to gauge whether the use of security-oriented capital inputs increased over the 2001-05 period, we turn to trade association data for the electronic security market published by Security Sales and Integration (2006). The types of electronic systems covered by these statistics are listed in the box.

In 2001, there were 30.1 million electronic security systems, commercial and residential, installed and monitored by the electronic security industry. Four years later, this number had grown to 30.8 million. While more security systems were in place in 2005, the increase of 0.7 million during the 2001-05 period fell far short of the 4.7 million increase that occurred from 1997 to 2001. Thus, we conclude that investment in the U.S. electronic security-related capital stock has not accelerated significantly since September 11, 2001.

Nevertheless, the average price of a security system has increased, rising from $6,100 in 2001 to $9,900 in 2005. This price increase presumably reflects both upgrades in the quality of the systems installed and changes in dealers' pricing strategies in response to demand shifts in recent years.

If we narrow our focus to those security systems installed for commercial and industrial use by the private sector, we calculate that the replacement value of these systems increased from about $116 billion in 2001 to about $193 billion in 2005.[8] This increase was almost entirely due to the rise in the average price per system.

However, because firms have generally not replaced all of their security systems, they have not paid the entirety of the replacement cost reported just above. To obtain an estimate of the cost flow involved in owning these capital goods, we consider their cost as their amortization at a 6 percent interest rate over twenty years.[9] From this exercise, we calculate that electronic security capital costs increased from $9.4 billion to $16.6 billion over the 2001-05 period.

Table 2
Increases in Direct Costs of Homeland Security

Item	Cost (Billions of Dollars) 2001	Cost (Billions of Dollars) 2005	Share of Economywide GDP (Percentage) 2001	Share of Economywide GDP (Percentage) 2005	Change in Cost: Billions of Dollars	Change in Cost: As Percentage of Change in Total Direct Cost
Public sector						
Federal homeland security budget	20.1	54.3	0.20	0.44	34.2	78.5
Private sector						
Security-related labor inputs	26.5	28.7	0.26	0.23	2.2	5.1
Security-related capital inputs[a]	9.4	16.6	0.09	0.13	7.2	16.5
Total direct cost	56.0	99.5	0.55	0.80	43.6	100.0

Source: Authors' calculations.

[a]Based on amortization replacement value of electronic security systems at a 6 percent interest rate over twenty years.

Total Direct Costs

If we sum the homeland security expenditures reported in the preceding sections, we find that cumulative expenditures rose from $56 billion (0.55 percent of GDP) in 2001 to $99.5 billion (0.80 percent of GDP) in 2005 (Table 2). Increases in federal government outlays on homeland security priorities account for a sizable 78.5 percent of this overall rise.

Private sector costs climbed from approximately $36 billion to $45 billion. But as a fraction of private sector GDP, these expenditures changed little, accounting for 0.46 percent in both 2001 and 2005. Similarly, as a fraction of economywide nominal GDP, private sector labor and capital expenditures

[8]We use historical market demand shares to estimate the replacement value of the electronic security capital stock in the private sector.

[9]We have chosen to calculate the cost of capital as an amortized replacement value. This choice means that our calculations do not include depreciation and maintenance costs, for which there are no satisfactory estimates.

together showed a *net* increase of only 0.01 percent over the 2001-05 period: the wage bill for protection workers declined 0.03 percent in these years while the replacement value of capital increased 0.04 percent. Overall, then, we find very little evidence of a substantial shift in the fraction of resources that the private sector applies to security-related activities.

To be sure, the estimates of input costs presented here should be taken with some caution. First, the lack of data on state and local outlays for homeland security means that we underestimate total public sector expenditures and may understate the growth of spending. Second, because our private sector measures include labor and capital expenditures devoted to the broad goal of "protection" rather than to homeland security more narrowly, our estimates for the private sector could be high. Finally, our capital stock results are based on limited data and specific assumptions.

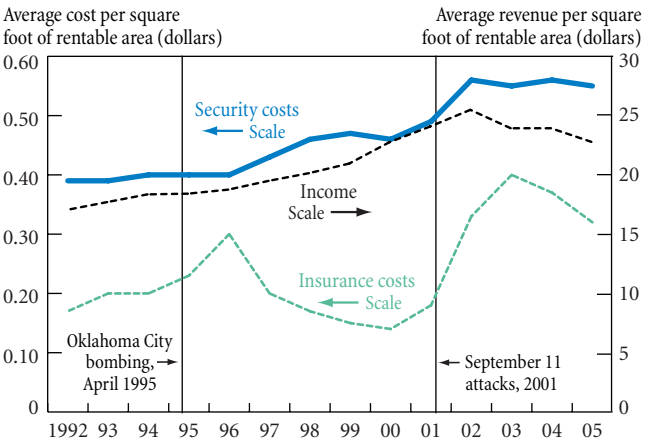
Nevertheless, while the limitations of our data imply that we might misclassify certain expenditures, our calculations do effectively compare the same expenditures for both 2001 and 2005. On this basis, we can assert with reasonable confidence that aside from federal government spending on homeland security, security-related expenditures have not accelerated over the last five years.

Sector-Specific Evidence on Security Costs

Recognizing the limitations of our total cost calculations, we present some additional, sector-specific evidence on security expenditures. Although direct evidence of most sectors' expenditures is sparse, the commercial real estate sector makes available detailed statistics on security and insurance costs. Specifically, the Building Owners and Managers Association International (1993-2006) produces annual reports on security and insurance costs per square foot of rentable commercial space.[10] The data are particularly interesting because the World Trade Center, one of the targets of the September 11 attacks, was commercial real estate; thus, in this sector more than in others, one might expect to see a marked rise in security spending.

In fact, security costs per square foot of rentable space do show a clear upward trend (Chart 2). From 1992 to 2001, security costs went up 25 percent, from $0.39 to $0.49 per square foot. From 2001 to 2005, security costs rose another 10 percent, reaching $0.55. Significantly, however, security costs in the commercial real estate sector have increased

Chart 2
Security Costs, Insurance Costs, and Income per Square Foot of Rentable Commercial Real Estate for Private Buildings



Source: Building Owners and Managers Association International (1993-2006).

approximately at the rate of inflation. Thus, there is little evidence of a substantial shift in resources toward security expenditures in this sector—a finding that is consistent with our earlier results for the nation as a whole.

As for insurance costs, they too appear to have increased substantially since 2001: they are up from $0.18 to $0.32 per square foot of rentable space. Since the major increase in insurance costs occurred after 2001, we can reasonably infer that some portion of the increase is due to the perceived threat of terrorism.[11] Nevertheless, the higher costs may reflect an increase in the average price of insurance policies as well as a move toward more extensive coverage. Thus, even when we consider this more detailed sector-level data, we find no clear-cut evidence of extensive increases in security-related costs since 2001.

Macroeconomic Impact of Homeland Security Spending

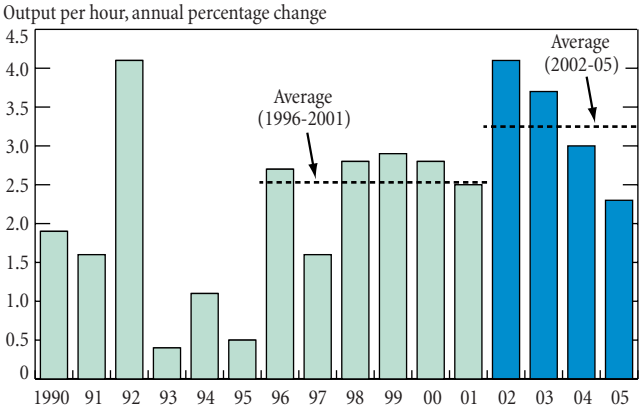
Another measure of the cost of homeland security is its effect on economic activity. If homeland security initiatives have diverted substantial resources from other uses and induced businesses to take precautionary actions, then one would expect economic growth to slow and firms to establish a buffer stock of materials and final products. These outcomes would, in turn, be reflected in such indicators as lower output and higher inventories.

We consider first how productivity, or output per hour, has fared. A private sector that was devoting sizable amounts of time and money to security-related activities that yielded

[10] Although insurance expenditures do not constitute a tangible input, they do in fact entail opportunity costs in the sense that payments of insurance premiums involve administrative costs and may drain cash—a particular problem for financially constrained firms. Otherwise, the payment of insurance premiums and payouts are contingent transfers.

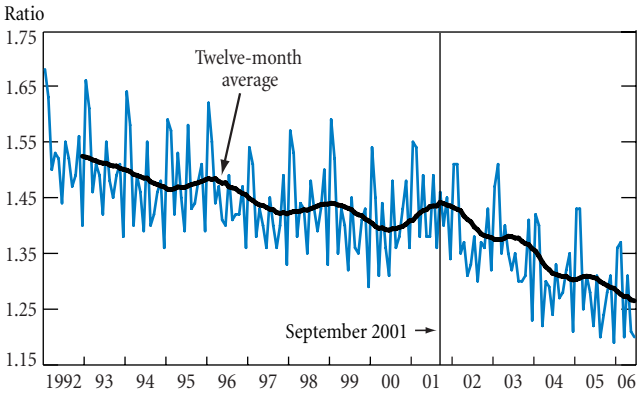
[11] Insurance costs per square foot of rentable space also increased after the Oklahoma City bombing in 1995.

Chart 3
Growth Rate of Average Labor Productivity in the U.S. Nonfarm Business Sector



Source: U.S. Department of Labor, Bureau of Labor Statistics (2006b).

Chart 4
Monthly Inventory-to-Sales Ratio for the U.S. Business Sector



Source: U.S. Bureau of the Census (2006).

no measured output would see a decline in the rate of productivity growth. Although it is hard to isolate the effect of homeland security from all other influences on productivity, we do know that productivity growth in fact accelerated, rather than decelerated, over the 2001-05 period. Indeed, the average productivity growth rate in the U.S. nonfarm business sector rose from 2.6 percent in 1996-2001 to 3.3 percent in 2002-05, a significant increase (Chart 3). These trends suggest, then, that while homeland security efforts might have had a small negative effect on productivity, the effect has been overshadowed by other mechanisms that drive U.S. economic growth.[12]

Second, we consider how inventory levels have changed. We might expect that after 2001, firms would build a buffer stock of inventories that would allow them to continue production and to supply their customers in the event that their own supply chain was interrupted.[13] However, a look at the inventory-to-sales ratio (I-S ratio) for the U.S. business sector from 1992 to the present suggests that firms are not maintaining substantial buffer stocks (Chart 4). After filtering out seasonal effects with a twelve-month moving average, we find that inventory-to-sales ratios have been steadily declining over the last fifteen years. There was indeed a slight uptick in the I-S ratio relative to trend after 2001—reflecting, perhaps, a move by the automobile and other industries to create buffer stocks in the immediate aftermath of September 11—but the I-S ratio appears to have returned to its pre-2001 trend path of decline. Given this evidence, we conclude that any buildup in buffer stock inventories was transitory and that the goods accumulated have since been sold off.

Productivity and I-S ratios are the two indicators most likely to reflect the broader economic impact of increased private sector security activities. Since neither appears to have been substantially affected, it is unlikely that homeland security efforts have contributed significantly to any slowdown in U.S. economic activity since 2001.

Conclusion

We find little evidence to suggest that increases in homeland security spending have led to far larger costs for the overall U.S. economy. While the share of homeland security spending in GDP rose from 0.55 percent in 2001 to 0.80 percent in 2005—an increase stemming in large part from the $34.2 billion step-up in the federal government budget on homeland security—spending on security-related inputs in the private sector does not seem to have increased as a fraction of private sector GDP. Instead, it has remained constant at about 0.46 percent. Moreover, forecasts by the Congressional Budget Office and the Bureau of Labor Statistics indicate that we should not expect a major shift in resources toward homeland security activities in the next decade. Finally, our look at output and inventory levels in the 2001-05 period suggests that homeland security outlays have not significantly constrained U.S. economic activity.

In concluding, we note that our analysis is intended as a purely descriptive exercise; we offer no normative assessments of the adequacy of current spending on homeland security. Although no major terrorist attacks have occurred on U.S. soil between 2001 and 2005, we are not in a position

[12]These mechanisms are discussed in more detail in Jorgenson, Ho, and Stiroh (2004).

[13]Griffy-Brown (2003) contains an illustrative discussion of how firms could go about developing better ways of dealing with supply chain disruptions.

to attribute this to the spending patterns reported in our study. Similarly, we have no grounds for saying that the resources we have identified as targeted to homeland security would ensure a sufficient response to a hypothetical future attack.

References

Board of Governors of the Federal Reserve System, U.S. Office of the Comptroller of the Currency, and Securities and Exchange Commission. 2003. *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System. Federal Register* 68, no. 70: 17809-14.

Building Owners and Managers Association International. 1993-2006. *BOMA Experience Exchange Report*.

Griffy-Brown, Charla. 2003. "Just-in-Time to Just-in-Case: Managing a Supply Chain in Uncertain Times." *Graziadio Business Report: Journal of Contemporary Business Practice* 6, no. 2.

Hobijn, Bart. 2002. "What Will Homeland Security Cost?" Federal Reserve Bank of New York *Economic Policy Review* 8, no. 2 (November): 21-33.

Jorgenson, Dale W., Mun S. Ho, and Kevin J. Stiroh. 2004. "Will the U.S. Productivity Resurgence Continue?" Federal Reserve Bank of New York *Current Issues in Economics and Finance* 10, no. 13 (December).

Security Sales and Integration. 2006. *Annual Installation Business Report*.

U. S. Bureau of the Census. 2006. *Manufacturing and Trade Inventories and Sales*. Available at <http://www.census.gov/mtis/www/mtis.html>.

U.S. Congressional Budget Office. 2006. *The Budget and Economic Outlook: Fiscal Years 2007-2014*. Available at <http://www.cbo.gov/publications/bysubject.cfm?cat=0>.

U.S. Department of Homeland Security. 2006. *Homeland Security Grant Program*. Available at <http://www.ojp.usdoj.gov/odp/grants_hsgp.htm>.

U.S. Department of Labor, Bureau of Labor Statistics. 2001, 2005. *Occupational Employment Statistics*. Available at <http://www.bls.gov/oes/>.

———. 2006a. *Occupational Outlook Handbook*. Available at <http://www.bls.gov/oco/>.

———. 2006b. *Productivity and Costs*. News release. Available at <http://www.bls.gov/news.release/prod2.toc.htm>.

U.S. Office of Homeland Security. 2002. *National Strategy for Homeland Security*. Available at <http://www.whitehouse.gov/homeland/book/>.

U.S. Office of Management and Budget. 2006. *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2007.* Available at <http://www.whitehouse.gov/omb/budget/fy2006/>.

About the Authors

Bart Hobijn is a research officer and Erick Sager an assistant economist in the Microeconomic and Regional Studies Function of the Research and Statistics Group.

Current Issues in Economics and Finance is published by the Research and Statistics Group of the Federal Reserve Bank of New York. Leonardo Bartolini and Charles Steindel are the editors.

Editorial Staff: Valerie LaPorte, Mike De Mott, Michelle Bailer, Karen Carter
Production: Carol Perlmutter, David Rosenberg, Jane Urry

Subscriptions to *Current Issues* are free. Write to the Public Information Department, Federal Reserve Bank of New York, 33 Liberty Street, New York, N.Y. 10045-0001, or call 212-720-6134. Back issues of *Current Issues* are available at <**http://www.newyorkfed.org/research/current_issues/**>.