Introduction

This special volume of the *Economic Policy Review*, issued soon after the one-year anniversary of the attacks of September 11, 2001, explores some of the key economic consequences of the attacks. The six articles that make up the volume address several important questions: How great were the losses in New York City on September 11 and in the difficult months thereafter? How much will the nation spend to prevent future attacks? Did the destruction of information and infrastructure impair the functioning of the payments and securities settlement systems, and what steps minimized further damage? Will these events hurt New York's future vitality and cause businesses and workers to retreat from the city?

The authors consider these questions from their vantage point in the Research and Market Analysis Group of the Federal Reserve Bank of New York. Economists in the Group conduct research and policy analysis in support of the New York Fed's responsibilities, which include carrying out the Federal Reserve System's open market and foreign exchange operations, managing payments-clearing activities between banks, contributing to the formulation of monetary policy, and tracking economic conditions in New York City and the Second Federal Reserve District. The economists' knowledge and experience in these areas inform their analysis of the September 11 events, as does their strong commitment to understand and illuminate events that took place in the Bank's own Lower Manhattan neighborhood.

The articles in the volume range in subject matter—from the concrete effects of the attacks on the financial system infrastructure to more abstract issues such as the viability of cities in the face of terrorism. But while the articles touch on a wide variety of topics, all employ the language and the viewpoint of economics. Thus, the authors follow the conventions of their discipline when they use forgone earnings to measure the "cost" of lives lost in the attack on the World Trade Center. Certainly, these losses should not be omitted from accountings, and forgone earnings is the best measure available for this purpose. However, the authors and editors recognize very clearly that the true cost of September 11—the grief, terror, and general loss of well-being—is beyond any calculus.

Overview

The six articles in the volume fall into three broad groups: 1) detailed accountings of economic costs—those incurred as a direct consequence of the September 11 attacks and those arising from efforts to prevent future attacks, 2) studies of the attacks' disruptive effects on the payments and securities settlement systems, and 3) analyses of New York City's prospects after September 11.

Cost Accountings

Jason Bram, James Orr, and Carol Rapaport begin the volume by analyzing the costs of the attack on New York City. Their account is indeed sobering. New York lost an estimated $7.8 billion in prospective earnings from those who died in the attack and $3.6 billion to $6.4 billion in job earnings from workers displaced afterward. These losses are distinct from the concurrent income losses attributable to the national recession and are spread across both high- and low-wage industries. Property losses—including the destruction of real estate, subway lines, and communications equipment—and the costs of cleanup and site restoration are expected to reach

$21.6 billion. Adding up the earnings losses, destruction of property, and cleanup costs, the authors calculate the direct damage from the attack on the World Trade Center to be between $33 billion and $36 billion. The additional productivity losses from psychological stress are harder to estimate, but quite real—as reflected in several surveys of city residents' experiences. Although insurance payments and federal aid have helped markedly to mitigate the attack's financial impact on New York City residents and businesses, these financial transfers do not lessen the more personal and psychological effects of the destruction.

The authors are careful to note that their cost estimates reflect the information available as of June 2002, the end of the recovery process at the World Trade Center site; the actual magnitude of the costs will become much clearer over time. There are, however, some signs that the brunt of these costs has already been borne: the Trade Center site has been cleaned up ahead of schedule, employment levels appear to have bottomed out, and housing market indicators remain surprisingly buoyant.

Focusing on the national effects of the attack, *Bart Hobijn* assesses how much the country might spend to prevent more such incidents. The federal government plans to spend $38 billion in 2003 on border security, protection against biological threats, emergency preparedness, and various other homeland security measures. State and local governments are expected to spend about $1.3 billion on security next year. Although a public expenditure of $39 billion is large in absolute terms, it is small relative to the $10 trillion expected output of the U.S. economy next year. Private-sector spending on counterterrorism is harder to gauge. Adopting the assumption that firms will double the amount they have spent in recent years on "protective services" (security guards, surveillance equipment, and so forth), Hobijn estimates that private security spending next year will reach about $33 billion. Thus, the author's total figure for the *direct costs* of homeland security spending for fiscal year 2003—private and public—is about $72 billion.

The effort to protect the nation from further attacks also entails indirect costs—including the inconvenience and delays experienced by the public as heightened security measures are put into place. Hobijn focuses on the costs associated with increased waiting times at airports. Drawing on a variety of sources, he estimates that about $12 billion will be lost this year in production and leisure time because passengers are waiting longer to pass through security checkpoints at airports.

Signficantly, Hobijn does not try to evaluate the efficacy of the $72 billion expenditure in securing the country against further attacks. A complete accounting of the economic costs of the attacks—one combining the $33 billion to $36 billion estimate advanced by Bram, Orr, and Rapaport for New York City and the costs associated with the Pentagon attack and the Pennsylvania crash—can only suggest the size of the loss that the country is seeking to prevent. A proper evaluation of the $72 billion expenditure would require an assessment of its impact on the likelihood of future attacks and on intangibles such as peace of mind—a very different, and difficult, question.

The Impact on the Payments and Securities Settlement Systems

The World Trade Center was not only an important symbol of business and finance, it was also a key location for those activities. The attack claimed lives, destroyed physical capital, and disrupted the information flows that facilitate transactions in financial markets. How well did the U.S. financial system withstand the blow? In particular, how did the various payments mechanisms—that is, the facilities used to transfer large amounts of money and financial instruments among institutions—perform on September 11 and the days that followed? And how did important market participants and policy institutions, including the Federal Reserve and the Treasury Department, respond?

Two articles in the volume examine the problems that arose in the payments and securities settlement systems in the wake of the September 11 attacks. The first studies the prolonged failure of brokers, dealers, and investors to deliver on Treasury security trades, and the second examines the disruption to Fedwire, the electronic network that processes large payments among financial institutions. The articles describe the technical exigencies and market conditions that led the Federal Reserve to inject vast amounts of liquidity into the banking system and to relax normal limits on securities lending.

Michael Fleming and Kenneth Garbade set the stage for their study of Treasury market functioning with a review of the market's normal settlement procedures. They then describe how the events of September 11 led to a huge and prolonged increase in settlement "fails" as sellers of Treasury securities did not meet their commitments to deliver securities on the dates scheduled. During the week ending September 19, daily average fails increased to $190 billion, a sharp rise from the $7.3 billion daily average observed during the first eight months of 2001. The increased fails can be traced to the technical problems created by the massive physical destruction in Lower Manhattan: several brokers and dealers could not operate, a clearing bank for dealers had to close its downtown offices, telephone lines were severed, and trading records were

lost. The Federal Reserve responded by relaxing its limits on securities lending, thereby making Treasury collateral more readily available. This action, together with restored communications, made the situation less acute, but fails persisted at higher than usual rates into October.

How did severe, but relatively short-lived, technical problems cause an extended disruption? Fleming and Garbade explain that "specials" rates—the rates that investors earn when they lend cash to borrow the particular securities they need to settle earlier trades—were near zero for several actively traded securities. The low specials rates gave investors little incentive to borrow securities to avert or remedy fails. The authors attribute the low specials rates in the weeks after the attack to a low federal funds rate and to concern among owners of securities that lent securities might not be promptly returned. Ultimately, worries that chronic fails were undermining market functioning led the Treasury to reopen its ten-year note. The additional supply raised the note's specials rate and increased investors' incentives to settle their trades. Fleming and Garbade conclude with a discussion of longer run reforms to prevent chronic fails, including the creation of a Treasury facility that could lend specific securities on a temporary basis and the imposition of a penalty fee for fails.

James McAndrews and Simon Potter investigate the problems affecting Fedwire, a backbone of the U.S. payments systems. Payments fell off sharply after the attacks: instead of the usual $10 billion per minute that flows over the wire near the end of most days, the end-of-day flow on September 11 was less than $2 billion per minute. The immediate problem was logistical: some banks were unable to send payments because of the destruction caused by the attacks. Because banks routinely use anticipated receipts to fund their own payments, many banks expecting payments found themselves unexpectedly short of liquidity. As a consequence, these banks were less likely to send payments to other banks in the normal pattern.

As the coordination of payments broke down, upsetting the distribution of balances across the banking system, banks sharply increased their precautionary demand for liquidity. McAndrews and Potter track this phenomenon by estimating banks' payments responses to the receipt of payments from other banks. The authors' analysis shows a distinct shift after September 11, with the typical bank requiring more of a liquidity cushion in advance of sending out payments than it had in the preceding period.

The Federal Reserve responded to the payments disruption by supplying extraordinary amounts of liquidity to the banking system: it loaned billions of dollars through the discount window (more than two hundred times the daily average amount of lending in the prior month), temporarily suspended penalties for bank overdrafts, and bought securities on the open market. In addition, Federal Reserve staff contacted the banks to assure officials of the availability of discount loans and to encourage them to make payments as usual. These actions by the central bank, McAndrews and Potter argue, helped reestablish payments coordination.

The authors identify the discount window as a particularly valuable tool in restoring coordination after September 11. The effectiveness of discount window loans calls into question the view espoused by some that open market operations alone can meet the liquidity needs of banks in extreme circumstances. The authors also discuss longer run payments system reforms—including infrastructure changes and changes in the protocols for submitting and settling payments—that might preserve coordination in the event of future disruptions.

Prospects for New York City: Can the Center Hold?

The September 11 attack was a severe blow to New York City. Could this event jeopardize the standing of the city as a leading financial capital? Will the trends toward higher income and improved quality of life in the city be halted or reversed by the attacks? Interestingly, the two articles that assess the city's longer term prospects reach similarly optimistic conclusions, despite very different approaches. One examines the economic trends that have helped New York City to prosper in recent decades and considers whether the attack will force the city off its course. The authors' findings indicate that New York's mix of industries should continue to serve the city well over the near horizon. The second article looks at current theories about why cities come into being, in order to assess the likelihood that terrorism could threaten the existence of New York. Here, the analysis suggests that forces strong enough to create cities are very difficult to overcome by terrorist actions.

Jason Bram, Andrew Haughwout, and James Orr use data on rents, wages, and labor shares to argue that the economic prospects for New York City at the time of the attack, even with the incipient recession, were favorable. Over a period of twenty-five years, New York City has enjoyed stable employment, rising real earnings, and appreciating land prices. Earnings in the city have advanced at a rate well above rates in the rest of the country, owing to accelerating productivity in the city's existing jobs and expanding employment in the high-paying services sectors—most notably finance. The high rents in New York, though lamented by residents, offer a clear indication that people are willing to pay a premium to live in

the city. Together, these patterns are consistent with a model of New York as an attractive, mature city in an open, competitive environment.

Looking forward, the authors tie the city's future to the supply of amenities such as safety, the arts, and municipal services, and to the demand for the goods and services produced in New York City. The authors find that trends in these areas have been encouraging in recent decades. With respect to amenities, crime rates have fallen rapidly, and the city government has strengthened New York's fiscal position, lowered property taxes, and improved public transit. Whether the fiscal strains from the attack will reverse these gains, the authors argue, will depend on how the city manages its finances and how it rebuilds the destroyed infrastructure.

As to the demand for its goods and services, New York City has a high concentration of some of the nation's fastest-growing industries, suggesting that the city's specialties tend to be in high demand. Moreover, national employment projections indicate that over the next decade, most of the city's key industries should fare better than average in generating jobs.

Seen in this context, the terrorist attack would be most damaging if it upset either the amenities available to city residents and businesses, or the demand for New York's products and services. Preventing such outcomes, the authors suggest, is the challenge now facing the city. New York's policymakers will need to close a substantial city budget gap without letting crime rise or municipal services deteriorate significantly, and without pricing New York's products and services out of the market. Judicious policy choices, along with the support of federal aid, will be key to New York's economic growth.

James Harrigan and Philippe Martin provide a more abstract analysis of New York City's prospects. They assess the viability of cities, and New York in particular, in the face of catastrophes such as terrorist attacks by considering why cities exist in the first place. The authors draw on two models, or theoretical explanations, for the existence of cities. The first centers on the idea that cities "pool" labor (that is, offer workers and firms an easy way to find each other); the second is based on the notion that cities lower transport costs (for goods shipped between producers and consumers). These rationales for the existence of cities are called agglomeration forces. In both models, the stable outcome—a city in equilibrium—is very stable indeed, because the agglomeration forces that create the city also tend to preserve it.

Using these models, Harrigan and Martin ask whether terrorism could overcome a city's agglomeration forces, causing firms and workers to scatter and the city to decline. They describe terrorism and the threat of terrorism as a special type of "tax" on a city's firms or residents, reflecting the costs of such hardships as higher insurance rates and security-related delays. This new tax detracts from firms' profits or workers' income without funding improvements in infrastructure or services, as a normal tax might.

The authors' simulations of the two models, conducted with data that approximate the characteristics of a large U.S. city, suggest that the vitality of cities could withstand terrorism "tax" rates well in excess of those that are likely to occur. Given the magnitude of the economic benefits that major cities generate, New York and its counterparts elsewhere should be remarkably robust in the event of subsequent terrorist attacks.

Concluding Remarks

The authors and editors hope that this volume will contribute to a fuller understanding of the September 11 events and their aftermath. In calculating the costs of the New York attack and those of protecting the nation from further assaults, the volume provides a measure of the injury sustained by the United States. But while these cost estimates may in some sense speak to the country's vulnerability, many of the volume's findings underscore the strong performance of our markets and institutions—both national and local—in a time of crisis. Economic data presented here show that New York City's prospects for growth remain favorable, while the economic theory outlined in the collection's final article upholds the resilience of all cities in the face of great shocks. The articles detailing events in the Treasury market and the nation's payments system tell a similar story of recovery, affirming the flexibility of U.S. financial and regulatory institutions and the resourcefulness of the individuals within them.

Erica L. Groshen, Linda S. Goldberg, James A. Kahn, Hamid Mehran, Donald P. Morgan, and Carol L. Osler