

HAS SEPTEMBER 11 AFFECTED NEW YORK CITY'S GROWTH POTENTIAL?

- Over the past three decades, New York City's economy has shown many signs of strength, including increased worker earnings and rising land prices.
- Although the attack caused a sharp temporary disruption in the economy, an advantageous industry mix—one weighted toward high-paying, rapidly expanding industries—is likely to keep the city well positioned for growth over the medium term.
- Still, if the city is to translate favorable prospects into actual growth, it must maintain an environment that is attractive to firms and workers. Thus, it must rebuild its damaged infrastructure and close a sizable budget deficit without letting services deteriorate or taxes rise too high.
- Preliminary evidence suggests that the demand for New York City property remains robust. Continued strength in land prices will be an important measure of the city's growth.

The terrorist attack on the World Trade Center claimed close to 3,000 lives and caused billions of dollars in property damage. In the aftermath, New York City's economy contracted briefly but sharply: many businesses were forced to shut down, mostly temporarily, and tens of thousands of workers were either dislocated for a short time or lost their jobs (Bram, Orr, and Rapaport 2002). The economic implications for the city, however, clearly extend beyond the first few months following the attack.

In this article, we analyze the effects of September 11 on the longer run prospects for the New York City economy. We find that, on the one hand, several downside risks to the city's growth outlook have arisen. In a worst-case scenario, the concentration of the attack on Lower Manhattan has raised the possibility that financial firms might relocate outside the city, which could generate a cumulative downward spiral of job and income growth. On the other hand, the city's industrial structure and its quality-of-life amenities—namely, an industrial mix weighted toward high-growth sectors and an environment desirable to workers and firms—suggest favorable economic prospects. However, whether or not these prospects translate into actual growth going forward depends to a large degree on the city's policy response to the economic pressures arising from the attack. The key elements of this response will be the ability to avoid budgetary decisions that

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The authors thank two anonymous referees, as well as Nathan Barczy for valuable research assistance. The views expressed are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

reduce the long-run attractiveness of a New York City location and, through rebuilding, to maintain the productivity of the city's capital stock.

We begin by describing recent earnings and land price trends in the city. To help interpret these data, we apply a model that emphasizes the importance of local property markets as an indicator of trends in a mature urban economy. The New York experience is then discussed in relation to the model, and the city's economic strengths and weaknesses both before and after the attack are evaluated. We also identify several challenges that local policymakers will face if the city is to recover fully. Finally, our study presents evidence on land prices after September 11 indicating that a strong demand for New York City property still exists.

GROWTH TRENDS IN NEW YORK CITY

Three important patterns characterize the trends in the New York City economy over the past three decades: steady but cyclical employment, rising real earnings, and appreciating land prices.

Economic growth at the national level is usually measured as the average annual rate of expansion of real (inflation-adjusted) GDP over some period. At the city level, however, an official output measure is not available and thus growth is often measured as the trend rate of growth in jobs and/or real

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income. Although in many localities these measures move together, the measures in New York City present different perspectives on the process of economic growth. Average total employment in the city essentially has been unchanged for three decades (Chart 1). Even with the rapid expansion of jobs in the mid-to-late 1990s, only in 1999 did total employment exceed its previous cyclical peak, in 1989. Indeed, the all-time peak level of total employment was reached in 1969.

In contrast, real earnings of city workers have trended upward since 1980 at an average annual rate of about 3.5 percent.

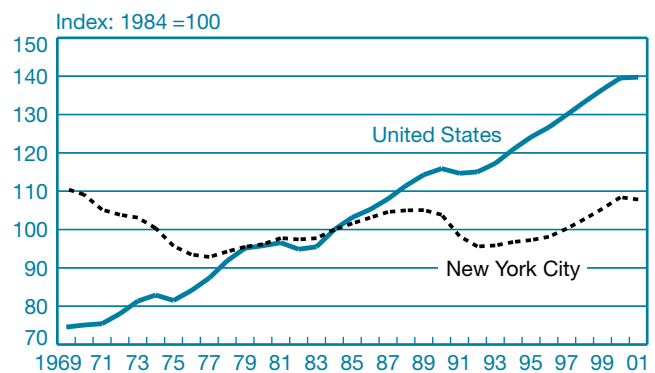
New York's pattern of steady employment and rising real earnings is attributable to occupational and industrial restructuring. Average earnings in the city have risen because of accelerating productivity growth in existing jobs and a shift

The city increased its earnings relative to the rest of the country by enhancing the productivity of existing employment and capturing a rising share of high-productivity jobs.

toward higher paying jobs. During the 1980s, the expansion of jobs in the high-paying FIRE (finance, insurance, and real estate) sector helped raise average real earnings citywide. Many of these job gains were temporarily reversed in the recession of the early 1990s. However, the city's recovery since the mid-1990s, in conjunction with the job expansion in some relatively high-paying service sectors, again boosted real earnings.

Over this same period, earnings per job increased nationwide, but New York's earnings per job rose even more rapidly (Chart 2). Thus, the city increased its earnings relative to the rest of the country by enhancing the productivity of existing employment and capturing a rising share of high-productivity jobs.

CHART 1
Total Employment in New York City
and the United States

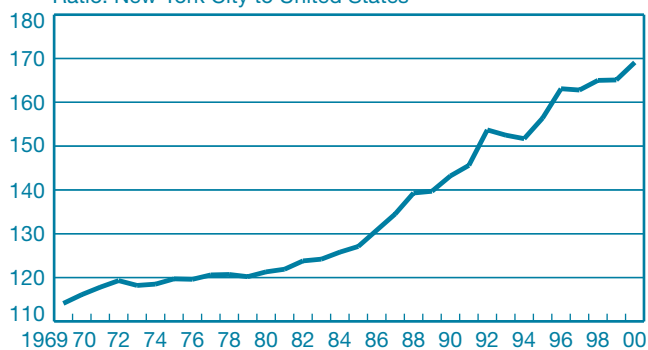


Source: U.S. Department of Labor, Bureau of Labor Statistics.

CHART 2

Relative Earnings per Worker in New York City

Ratio: New York City to United States



Sources: U.S. Department of Commerce, Bureau of Economic Analysis (earnings); U.S. Department of Labor, Bureau of Labor Statistics (total employment).

Note: Earnings are nominal.

Furthermore, the price of housing in New York has also risen relative to the nation since 1976 (Chart 3). Here, we use the repeat-sales price index, which controls for the quality of the structure, as a measure of price change. Constant-quality housing price changes provide a relatively clean measure of the attractiveness of the bundle of local traits available to residents of these homes. These data indicate that the price of residing in New York has climbed relative to the rest of the nation—with a particularly sharp rise in the second half of the 1990s.

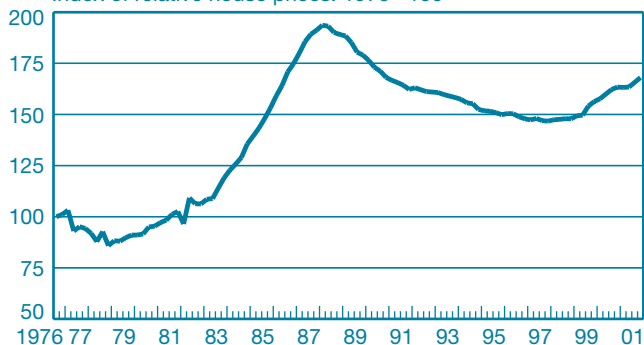
MODELING GROWTH IN A MATURE CITY

To analyze the effects of the terrorist attack on the New York City economy, we adopt the model of urban economies developed by Roback (1982) and refined in Blomquist, Berger, and Hoehn (1988), Gyourko and Tracy (1991), and Haughwout (2002). In this framework, metropolitan areas are viewed as small, open economies to which labor and capital are elastically supplied (see the box for more details on the model). Since each city is just one of many places where firms and households may choose to locate, it must offer competitive levels of profit for firms and utility for households. The value of a city to firms and households determines their “bids” in the city’s local land and labor markets. Thus, if a location has fixed characteristics that are extremely productive, firms will offer

CHART 3

New York City Area House Prices Relative to U.S. Average

Index of relative house prices: 1976 = 100



Sources: Office of Federal Housing Enterprise Oversight; Federal Reserve Bank of New York calculations.

Notes: The index is based on the ratio of the repeat-sales price measure for existing single-family homes in the New York City metro area to that of the United States overall; the index is designed to control for changes in the mix of homes sold. Data for the city itself are not available, so we present the index for the New York City primary metropolitan statistical area (PMSA), which consists of the city’s five boroughs (the Bronx, Brooklyn, Manhattan, Queens, and Staten Island) and Westchester, Putnam, and Rockland counties in New York State. Approximately 80 percent of the population of the New York PMSA lives within the city boundaries.

high bids for sites and high wages to attract workers there. Locations may vary in their attractiveness to firms for a variety of reasons, ranging from access to valuable existing infrastructure stocks to proximity to markets or sources of raw materials.

Given this set of productive amenities, firms will relocate if wages and/or land prices are too high for them to make equilibrium profits. If costs are so low that incumbent firms can make excess profits, new firms will enter, bidding up local prices. A similar logic applies to households. In a mixed economy that provides sites for households as well as firms, local land and labor prices are determined by the satisfaction of firm and household equilibrium conditions. The local price equilibrium is thus attained when no firm or household wishes to relocate.

When a city’s productive or residential environment changes over time, such changes will be reflected in local prices. Improvement in a city’s appeal to firms and/or households will lead to a rise in relative land prices over time.¹ When a city’s attractiveness is at its highest to firms (for instance, if taxes paid by firms fall but nothing else changes), wages will tend to rise.

A Model of Local Prices in Mature Urban Economies

Free mobility means that firms and households must pay, albeit indirectly, for attractive local characteristics. Firms and households pay for local amenities through higher land prices and wages. Thus, when a place offers household amenities like an attractive climate or unique consumption opportunities, households will be willing to pay to locate near these amenities, bidding more for land there. Yet, since wages represent an income source to households, they will also be willing to accept *lower* wages to locate in places with features they value. If a place is a “bargain” to households in the sense that its land prices are low and its wages are high relative to its attractive amenities, households will move in, bidding land prices up and wages down. Firms, however, bid more for attractive sites in both land and labor markets.

Exhibit 1 presents equilibrium land and labor bids by a competitive firm (labeled $\Pi = \Pi_0$) and a representative household (labeled $V = V_0$) for a place with a given set of production and consumption amenities (A_0). Note that the firm curve (an isoprofit curve in the price space) is downward-sloping, indicating that as wages in a jurisdiction rise, land rents must fall if firms are to remain profitable. The household indifference curve in the price space is labeled V , and it slopes upward: higher wages are associated with higher land prices. With higher incomes, households must pay higher land rents or they will earn excess utility—leading to new households

EXHIBIT 1

Wage and Land Rent Equilibrium

Land price per acre

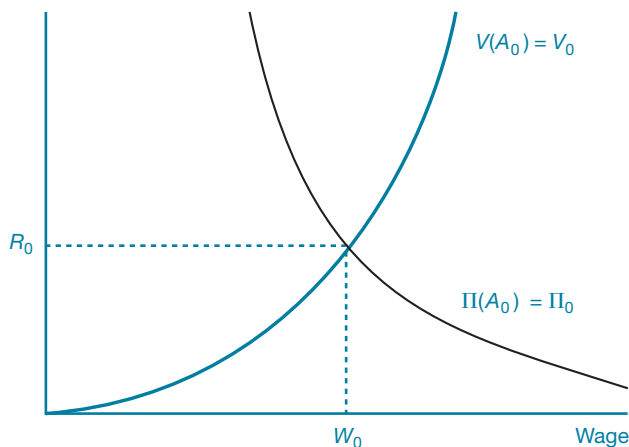
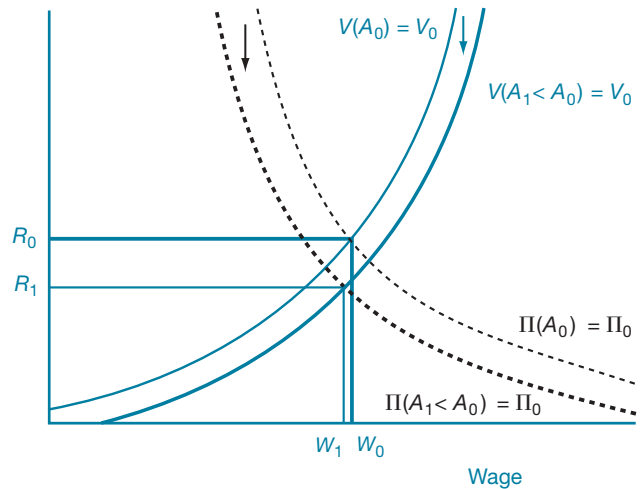


EXHIBIT 2

Wage and Land Rent Equilibrium with Fewer Amenities

Land price per acre



bidding in local land and labor markets. The point where both the firm and household equilibrium curves intersect is the local price equilibrium (W_0, R_0).

Exhibit 2 depicts the effect of a change in local amenities (to $A_1 < A_0$) on this equilibrium. When a city becomes less attractive to firms, the $\Pi = \Pi_0$ curve shifts downward. Changes that reduce the attractiveness of a location to households will shift the $V = V_0$ function downward. For given wage levels, firms and households are willing to pay less for land in unproductive places. Note that a reduction in attractiveness has an unambiguously negative effect on land prices, but that the effect on wages will depend on which curve (household V or firm Π) shifts more. When firms are disproportionately hurt by a change, the fall in equilibrium land rents will be accompanied by a *reduction* in wages. A relatively large impact on households would lead to *increases* in wages, as households demand higher compensation to induce them to reside and work in an unattractive, low-amenity place.^a

^aHaughwout (2002) formally derives these comparative statics and provides an example of the use of wage effects in the determination of the incidence of policy benefits.

When households receive the lion's share of the benefits of an amenity change (perhaps a costless reduction in the rate of violent crimes), relative wages would be expected to fall.

Wage and land price data for New York City indicate that the trends prior to September 11 were favorable, as both wages and relative land prices had been increasing over long and short horizons (Charts 2 and 3). Land price increases are a sign of growing attractiveness to firms and/or households, while wage increases indicate that businesses increasingly value a New York location relative to households. Interpretation of the wage increases observed in the city, however, is also confounded by the change in the population's characteristics over time, as we shall discuss.

Prices of housing and land, both of which are durable assets, reflect not just current conditions, but also market participant views of a location's future. The demand for a property is determined by the present value of the stream of net benefits expected to accrue to the property over its lifetime. When an individual purchases a piece of real property, he or she must evaluate future conditions in the area where the property is located. If conditions are expected to deteriorate next year, or in five years, then purchase prices this year will be reduced, as the stream of returns into the future falls. Relative property prices in any period thus indicate, in part, expected future conditions in that location. Note that this predictive power of property prices does not extend to either property rentals or wages—both of which reflect current conditions or, more precisely, conditions expected to pertain to the duration of the contract.

Our discussion provides some insight into the sources of the apparent land market strength in New York City. Among the factors explored in some detail in the academic literature are changes in local fiscal policies, such as a fall in local taxes without compensating service decreases or an increase in local infrastructure provision. On the household side, safety from crime, the quality of the public educational systems, and taxes are all considered important factors determining local quality of life and thus local land and labor prices (see Blomquist, Berger, and Hoehn [1988] and Gyourko and Tracy [1991]). Measured by several of these factors, conditions in New York have improved over the past thirty years, with especially sharp improvements occurring in the past decade.

Applying the Model to New York City

Here, we extend the model presented above to account for the various types of firms and households that are locating in a modern economy.

The model dramatically simplifies the structure of mature real-world economies, wherein many kinds of firms and households coexist, particularly in urban areas. As a practical matter, the way that firms and households sort themselves over space is relevant as an indicator of both evaluations of locations and the prospects of particular areas. Thus, the fact that New York's relative (constant-quality) home values have increased significantly versus those of the nation indicates that the city has become more attractive to households and/or firms over the past few decades.²

Still, the benefits of a New York City location are clearly not the same to all actors in the economy. New York's industrial and demographic structures differ from those of the nation because some groups are willing to pay more than others for the city's particular amenities. Most obviously, New York's long domination of financial services employment provides significant incentives for firms in that industry to locate there.³ But this same feature is less attractive to producers in, say, the automotive industry. Examples of the city's critical household amenities include relatively easy access to high-skill service employment opportunities and a diverse set of consumption opportunities such as theaters, museums, and other cultural offerings. However, the city's public schools, by most criteria, fall short of their suburban counterparts on several crucial dimensions.⁴

The fact that New York's appeal as measured by its relative land prices is near an all-time high seems to be contradicted by population and employment figures that have fallen relative to the nation. However, New York's situation is more complex than simple figures demonstrate: the city has substituted high-paying, high-productivity jobs in a few industries for low-skill, low-paying jobs in others. On the household side, corresponding changes in the composition of the local population have also tended to support a strong housing market, as we shall explain.

Clearly, the city's future depends on the growth prospects of the types of firms and households that have revealed a preference for New York. If, for example, the nation's financial services industry were expected to decline significantly, the city's concentration of these jobs would become a liability rather than an asset. Likewise, if concentrations of high-skill individuals or immigrants were detrimental to employment or population growth, the city's prospects would be dimmed.

New York's future—and the effect of events such as September 11—will therefore depend on the answers to two important questions:

- Can New York continue to provide the amenities valued most by those industries vital to its economy?

- Will the industries that benefit most from these amenities continue to thrive at the national level?

Our analysis suggests that the answers point to favorable prospects for New York City, although the future will not be without policy challenges. Our evidence indicates that New York is increasingly specialized in the production of skill-intensive services and in the provision of residences for high-skill workers and immigrants. These factors have supported rising land prices and wages in the city over the past three decades.⁵

THE CITY'S GROWTH FUNDAMENTALS

According to the model we employ, the desirability of a city springs from its productive and residential amenities. We begin our discussion of New York City's growth fundamentals by highlighting two key improvements over the past two decades that have made the city attractive to firms and workers: an improved fiscal position and a reduced crime rate. These improvements reflect both explicit policy choices and a healthier local economy. Next, we examine the associated changes in the city's industry and population mixes by reviewing the city's industrial structure and considering the medium-term prospects for these industries. Trends in the financial services sector are emphasized, because its fortunes exert a strong influence on the city's overall performance. We find that the local economy tends to have a relatively high concentration of industries expected to lead the nation in growth over the next decade. Finally, by profiling the changes in the local labor force, we find a more advanced educational profile in the city than in the nation as a whole—an advantage that has increased over the past ten years.

New York's Productive and Residential Environments

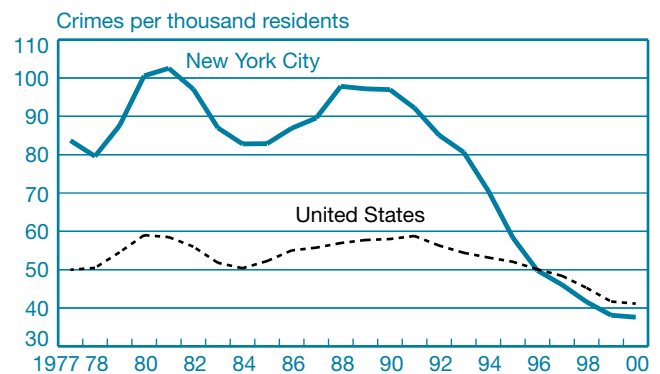
Both firms and households have benefited from the dramatic improvements in the city's financial condition since 1975, when New York experienced its most severe fiscal crisis since the Great Depression. The city has substantially reduced its reliance on debt finance, lowered property taxes, and enhanced its financial reporting since then (Haughwout 1997). Although the overall tax burden remains high, the share of the local tax dollar used to service short-term debt has been sharply reduced. Improvements in the city's public transportation

system, particularly during the 1990s, also have presumably benefited firms and households.

Public safety is another key aspect of a location's attractiveness. In that regard, New York's crime rate tells a compelling story (Chart 4). The rate, which actually rose during the economic boom of the 1980s, began a steady and steep decline in 1991 (amidst one of the city's worst recessions) that continued through the end of the decade. Although the 1990s saw a downward trend in crime nationwide and the city's improving economy clearly helped to lower the crime rate, New York's decline in crime was even more pronounced. Moreover, neighborhood-specific data from New York City suggest that the sharpest declines in crime over this period tended to occur in the poorest areas and highest crime areas. The U.S. Census Bureau's periodically conducted New York City Housing and Vacancy Survey (HVS)—which includes a resident-reported measure of "neighborhood quality"—indicates that city dwellers perceived significant improvements in crime in their own areas, with the sharpest improvements noted in the poorest neighborhoods.

Although these improvements in the business and residential environments have helped to enhance relative land and labor prices, New York's portfolio of amenities is not without certain liabilities. Perhaps the most important of these are the city's relatively high taxes on residents and businesses, and public schools that fall short of suburban competitors. Nonetheless, the evidence suggests that these liabilities have been outweighed by improvements in recent decades.

CHART 4
Annual Crime Rate of New York City and the United States



Sources: Federal Bureau of Investigation; New York State Division of Criminal Justice Services.

Industry Mix

A city's industry mix indicates which sectors benefit most from its particular package of amenities and helps determine medium-term growth prospects. New York has long had a significant concentration of employment in the financial services industry. Firms in this sector appear to strongly value proximity to one another, implying that New York's main advantage in this sector has promoted its growth over the past several decades.⁶

In addition, areas with a high concentration of growth industries tend to benefit from trends in the broader economy. Accordingly, we examine New York City's current industry mix, which has resulted in part from the aforementioned changes in the city's environment. We find that the current mix

In recent years, industries with a high concentration in New York City have tended to register relatively brisk job growth at the national level and are projected to continue doing so over the next decade.

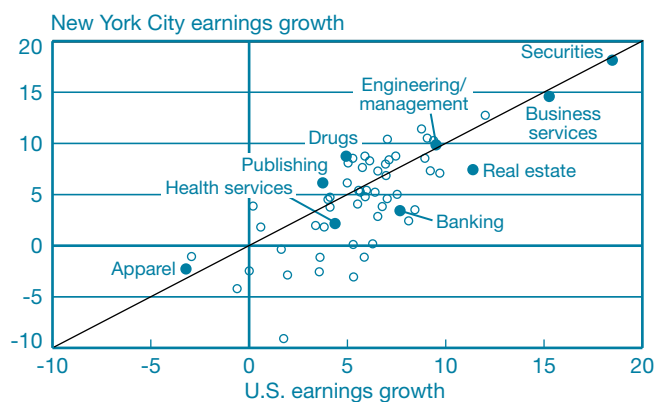
is strongly weighted toward growth sectors. By comparing the performance of these industries in the city with their national counterparts, we find that most local industries have tended to lag moderately in terms of income growth but fairly substantially in terms of job growth. This finding is consistent with the model of New York City as a mature economy, with less potential for expansion than most parts of the nation—if for no other reason than land and space constraints.

In recent years, industries with a high concentration in New York City have tended to register relatively brisk job growth at the national level and are projected to continue doing so over the next decade. In particular, the securities, business services, motion picture, legal, social, educational, and management services industries have all registered solid job and earnings growth at the national level, and their attraction to New York City has contributed to strong overall gains for the city. Conversely, the industries with the weakest trends in employment and earnings—almost all of which are in the manufacturing sector—are, for the most part, currently underrepresented in New York City. One notable exception is apparel manufacturing, which, though far less important than it was a few decades ago, is still one of the city's key industries.

Here, we illustrate the overall net effects of these industry dynamics by separating out the marginal effects of *local factors* and *industry mix* on overall income and job growth. Specifically, we decompose the differential between local and national growth into two components. *Local-factor effects* represent the performance of local industries compared with their national counterparts; these effects represent the portion of the overall growth differential not explained by local industry mix. *Industry-mix effects* represent what the differential would be if local job growth matched national job growth exactly within each industry; these effects represent the extent to which growth is enhanced or diminished by virtue of the local area's particular industry mix.

We conduct this exercise by first looking at changes in earnings over the 1995-2000 period to gauge the dynamics of the city's recent economic boom. Chart 5 presents local relative to national earnings growth for most two-digit Standard Industrial Classification industries, with selected key industries highlighted. As we see, some industries (those above the line) grew faster locally than they did nationally, while others (those below the line) grew more slowly. On balance, though, New York City's industries lagged their national counterparts in growth by an estimated 0.6 percentage point. However, because some of the nation's fastest-growing industries were

CHART 5
Earnings Growth by Industry: United States
versus New York City, 1995-2000



Sources: New York State Department of Labor; U.S. Department of Labor, Bureau of Labor Statistics.

Notes: Industries above the diagonal line registered faster earnings growth in New York City than they did nationally; those below the line experienced below-average growth in New York City. The dark circles represent selected two-digit Standard Industrial Classification industries that are important to the New York City economy.

overrepresented locally, New York City benefited disproportionately from its industry mix, as aggregate earnings growth was boosted by an estimated 2.3 percentage points (see table).

In terms of employment growth between 1995 and 2000, these effects were somewhat less pronounced, but they generally worked in the same direction. Here, positive industry-mix effects fully offset negative local-factor effects, leaving overall local job growth on a par with that of the nation. Over this five-year period, the local-factor effect in earnings per job was very near zero. That is, all of the city's relative growth in earnings per job was attributable to industry mix.

To gauge the likely impact of industry mix going forward, we performed a similar analysis using Bureau of Labor Statistics *projected* job growth rates by industry. The projected rates are for 2000-2010; comparable rates would presumably apply for 2002-12. Although we cannot predict local-factor effects, based on this information, industry-mix effects should continue to contribute positively, albeit modestly, to local job growth, as demonstrated in the table. As Chart 6 illustrates, industries with above-average expected job growth tend to be more concentrated in the city than those with subpar growth or job losses. Still, to the extent that local industries continue to lag their national counterparts in job growth, it is unclear whether local job growth would keep pace with the national average.

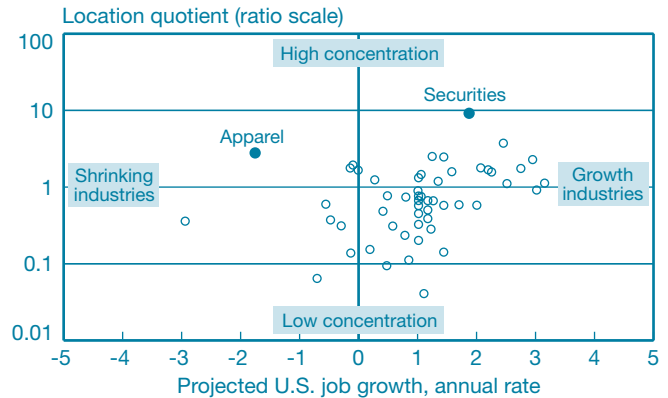
Because New York City has been moving toward increasingly high-value-added (and high-salary) industries and businesses over time, a comparison of local employment trends with corresponding national trends tends to understate the city's true relative performance. In fact, a study by McCarthy and Steindel (1997) points to the metropolitan region's persistently strong income growth as an indication of healthy

Average Annual Growth in Earnings and Employment Percent

Category	Total		Earnings	
	Earnings, 1995-2000	Employment, 1995-2000	per Worker, 1995-2000	Employment, 2000-2010
National growth	7.1	2.5	4.5	1.7
Local-factor effect	-0.6	-0.5	-0.1	—
Industry-mix effect	+2.3	+0.5	+1.7	+0.3
Local growth (New York City)	8.8	2.5	6.1	—

Source: U.S. Department of Labor, Bureau of Labor Statistics.

CHART 6
Projected U.S. Job Growth in 2000-2010 versus New York City Concentration



Sources: New York State Department of Labor; U.S. Department of Labor, Bureau of Labor Statistics; Federal Reserve Bank of New York calculations.

Notes: A location quotient is a measure of local industry concentration. It is defined here as an industry's share of employment in New York City divided by its national share. For example, the securities industry accounts for 4.9 percent of jobs in New York City, but only 0.57 percent of jobs nationwide, so its location quotient is $4.90/0.57=8.6$. Thus, this industry's share of New York City employment is 8.6 times the U.S. average. The dark circles represent the chief two-digit Standard Industrial Classification industries in New York City.

demand for its goods and services. The authors argue that if income is holding up fairly well, then spending on regionally produced goods and services is high and business in the region may be more robust than the employment data suggest. As depicted in Chart 2, average earnings per worker have consistently grown more strongly in New York City than nationwide; between 1995 and 2000, this growth was due entirely to *industry mix*. If these long-standing trends persist, New York City should continue to fare better in terms of income growth than in job growth.

Looking forward, we note that to the extent that local-factor effects on earnings and employment remain neutral or small—a condition that depends on New York City remaining an attractive site for business locations—the city may be expected to continue its long-standing pattern of rising earnings and cyclical but steady employment. Were city conditions to deteriorate, however, the positive industry-mix effect could be insufficient to offset large, negative local-factor effects in employment and even earnings per job. The role of the terrorist attack in this scenario is discussed later.

The Financial Sector

New York City has a favorable and diverse industry mix—at least within the service sectors—yet financial services stands out as a key sector driving the local economy. The securities industry alone accounted for 5 percent of city employment in 2000 and an estimated 20 percent of city earnings. These shares were higher than they were at any point in history and roughly eight times the respective U.S. figures. Not surprisingly, then, trends in the financial sector dominate the local economic landscape. In fact, a recent study (Bram and Orr 1999) finds that cycles in the financial sector—particularly the securities industry—tend to presage cycles in the broader local economy.

Accordingly, the steep contraction in Wall Street employment over the past year—driven by the national recession, particular weakness in the financial markets, and the September 11 attack—is a matter of serious concern and appears to pose the greatest threat to the city’s medium-term growth prospects. The fact that securities employment has also

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fallen, albeit somewhat less sharply, in the rest of the country suggests that these job losses reflect a combination of industry- and city-specific factors. Financial services will be an important sector to monitor when gauging the overall health not only of Lower Manhattan, but also of the broader regional economy. Over the longer term, the Internet and general advances in information and communications technology are likely to continue to have important effects on the broad structure of the financial services industry (see Orr and Rosen [2000] for a more complete discussion).

Labor Force Composition

New York City’s population growth accelerated over the past decade. According to the decennial U.S. census, the city’s population grew 9.4 percent during the 1990s—the strongest growth since the 1920s. Moreover, adjacent counties across the metropolitan area also saw increasingly brisk gains. Because

New York City’s economy tends to be a major hub of information-based industries, the metropolitan area’s labor force, not surprisingly, has a much higher proportion of college graduates than the nation overall. Much of the area’s highly educated population resides in the suburbs, but the city itself has attracted a very well-educated workforce. In the city proper, an estimated 30.5 percent of adults are college graduates—a share well above the national average of 25.2 percent. More important, though, is the *change* in educational attainment: in 1991, just 22.1 percent of New York City adults were college graduates, only slightly more than the national figure of 21.4 percent.⁷ This indicates that New York is growing in attractiveness as a residential location for well-educated Americans. Because high concentrations of well-educated residents are beneficial to urban growth (Rauch 1993), this component of the city’s population base is a positive factor for its future prosperity. In addition, the city is home to many immigrants, presumably because of its historical role as an immigration gateway. Although the effect of large stocks of immigrants on local labor markets is unclear, recent research suggests that these individuals tend to support a vigorous housing market (Saiz 2002). Thus, a reduction in immigration to the United States would disproportionately affect New York, if only in terms of population growth.

In sum, our empirical examination of New York City’s changing industry and population mix shows the city to be attractive to those industries that benefit from its productive amenities and to a relatively highly skilled and highly educated labor force. These results are consistent with the model of a mature urban economy as well as with the rising land prices and real wages observed in the city over the past two decades.

Although the city is currently well positioned for growth over the medium term, the aftermath of September 11 could disturb this equilibrium. For example, a change in the medium-term industrial outlook is possible, but it does not appear likely at this time. A more likely factor that could affect this equilibrium is the city’s policy response to the economic pressures arising from the attack. The task now faced by New York City is to restore and maintain the productive amenities and attractive environment for both firms and workers.

POLICY CHALLENGES AFTER SEPTEMBER 11

Although the city’s industrial and population structures on September 10 were favorable for its continued prosperity, the loss of life and property on September 11 represents a journey into uncharted waters. Accordingly, we now explore certain

effects of the attack in more detail and examine whether the specific types of damage to the city's economy might jeopardize its future. In the language of the model described earlier, the attack most likely induced shifts in the household and firm curves. But how large were these shifts, and what role can policy play in restoring the city to its pre-attack equilibrium? To answer these questions, we consider the future policy implications and challenges for the city in terms of its finances, its infrastructure, and the subsequent federal aid package.

Closing the City's Budget Deficit

The September 11 attack caused a significant short-run fiscal drain on the city. Although it is difficult to isolate the attack's effect on New York City's tax revenue, city agencies estimate that the attack will have reduced revenue by 3 percent to 7 percent in fiscal year 2001-02 and by 2 percent to 6 percent in fiscal year 2002-03.⁸ Although the losses represent a sizable shock to the city's revenue stream, they are considerably less severe than the losses faced by the city during its 1975 fiscal crisis. In 1975, the city had to refinance a net cash deficit of more than 25 percent of total tax revenue. The city revenue

The first policy challenge for the city . . . is to close its current budget gaps at the least possible cost to its long-run vitality.

costs of the September 11 attack are much more in line with the reversal in the city and national economies in fiscal year 1990. That year, revenues from the city's four major taxes (personal income, sales, property, and general corporation) fell approximately 0.5 percent after having grown by more than 3.7 percent the previous year—a swing of 4.2 percent in revenue growth rates (Haughwout 1997). Thus, the tax revenue shortfall related to September 11 is of a magnitude similar to the effects of the city's 1990 recession.

Revenue shortfalls of this magnitude require concerted action to avoid ending the fiscal year with a deficit. In New York, deficit spending led to the severe fiscal crisis of 1975; since then, the city has been under a strict balanced budget regime. In 1990, faced with a shortfall of similar magnitude, the city raised personal income tax rates sharply to bring the budget into balance in fiscal year 1991. Today, the issue facing city officials is how to react to the current shortfall, which has

been compounded by the effects of the recession and declines in equity markets. The historical pattern in New York has been to raise taxes to close budget gaps, and this is indeed the quickest way to generate cash. However, tax increases—particularly at this point in time—may be costly in the long run.

Recent research into the relationship between tax rates, bases, and revenues in four U.S. cities, including New York, indicates that these cities are very near the top of their local "revenue hills" (Haughwout et al. 2000). This means that increases in tax rates can reduce the base over time in such a way as to generate very little additional revenue in the long run. Instead, they may distort the local economies, leading to various forms of tax avoidance, especially the loss of economic activity to other jurisdictions.

Therefore, although tax increases could help close the city's current budget gap in the short run, they might well come at a substantial long-run cost, as higher taxes would make the city a less attractive location for mobile firms and households. Haughwout et al. assert that the deleterious effects of city tax increases can extend beyond the tax base by also reducing the size of the real economy and the job base. Such a reduction in the job base, unlike the temporary displacement of jobs from the September 11 attack itself, could last for the duration of the tax increases. Of course, temporary tax increases might have smaller and less durable effects.

The first policy challenge for the city, then, is to close its current budget gaps at the least possible cost to its long-term vitality. The alternative to tax increases, of course, is expenditure reductions, themselves costly. In addition, it may be viable for New York City to obtain federal and state aid to help it through this difficult period.

Rebuilding Damaged and Destroyed Infrastructure

Compounding the fiscal problems facing the city and its residents is the fact that a significant part of the damage to Lower Manhattan was sustained by public facilities, notably the Port Authority Trans-Hudson (PATH) train station in the World Trade Center. In addition, some streets and city subway lines were heavily damaged. These facilities allow Lower Manhattan to function as an employment center for the city and the region. Without ready access to Lower Manhattan, one of the city's growth engines—the financial services and related industries concentrated around Wall Street—is cut off from the rest of the region.

More generally, evidence from the academic literature indicates that the productivity of city public capital (that is, its

value to firms) is modest, but positive. Eberts (1990) and Haughwout (2002), for example, estimate output elasticities of around 0.04, meaning that a loss of 1 percent of a city's public capital stock is associated with a 0.04 percent decline in city productivity. Interestingly, household costs are estimated to be somewhat higher, yielding a total land price elasticity of about 0.12. These figures suggest that infrastructure stocks exert a significant influence on a city's attractiveness.

Initial reports indicate that New York's public facilities experienced approximately \$1.4 billion in damage from the September 11 attack (Bram, Orr, and Rapaport 2002). This amount is approximately 1.5 percent of the city's preexisting

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infrastructure stock (Haughwout and Inman 1996), implying a 0.18 percent decline in city land values as a result of lost infrastructure, assuming that the losses are permanent.⁹ The losses, however, are unlikely to be permanent.

The importance of these facilities to New York City can be illustrated by way of a rough calculation of the value of the World Trade Center's PATH station. With the destruction of that facility on September 11, some 20,000 New Jersey–Lower Manhattan commuters were forced to find alternate means of transportation to work. For some, this required a shift to more expensive ferries crossing the Hudson River from Hoboken, New Jersey. But for the substantial number who had commuted from the PATH station in Newark, New Jersey, the quickest option was to take a commuter rail to Pennsylvania Station in New York City and then a city subway to Lower Manhattan. New Jersey Transit, the state's commuter line, estimates that daily ridership to Pennsylvania Station increased by 15,000 passengers following September 11, despite the immediate loss of jobs experienced (New Jersey Transit 2001).

For these riders, a twenty-two-minute ride from Newark to Lower Manhattan was replaced by a twenty-minute train ride to midtown plus a twenty-to-thirty-minute subway ride downtown, with a similar lengthening of the homeward commute. The additional time cost is thus approximately one

hour per commuter per day. If we assume that 15,000 workers who value their commuting time at \$25 per hour (half their hourly wage) are spending an additional hour per day commuting, we obtain a daily cost of \$375,000, implying that the first year's loss of the World Trade Center PATH station cost nearly \$100 million in lost time.¹⁰ Thus, simply replacing the station would prevent this annual cost from becoming a perpetual loss, with a present value of nearly \$2 billion.¹¹

These calculations are intended to give an order-of-magnitude estimate of the value of Lower Manhattan's infrastructure systems to the city and the region. In the short run, New Jersey commuters and their employers are paying the costs of this lost infrastructure, as workers must either spend less time at work or less time with their families and friends. Although it is less certain exactly who will gain the most, rebuilding the PATH station will clearly benefit the metropolitan area's economy as a whole. Moreover, any additional improvements to Lower Manhattan's transportation linkages should further enhance the regional economy's potential.

As of this writing, the Port Authority of New York and New Jersey has publicly committed to rebuilding the PATH station, and the city has made substantial progress in repairing other damaged elements of the downtown infrastructure. Ensuring accessibility to established job centers in the region is thus a crucial policy challenge facing the city; doing so should reverse the initial negative effect of September 11 significantly.

Using Federal Compensation Effectively

Since the attack on the World Trade Center, much has been done to foster the recovery of New York City, and Lower Manhattan in particular. An outpouring of support nationwide has sought to provide spiritual and financial aid to the victims and to the city as a whole. Several blue-ribbon committees have been formed to assess the damage and monitor the progress made in rebuilding. To date, the federal government has committed \$21.7 billion to the rebuilding effort. These funds will be allocated to various efforts to sustain and rebuild New York, ranging from subsidies to residential properties, to the accelerated depreciation of business plants and equipment, to the repair and reconstruction of local streets (New York City Independent Budget Office 2002).

It is therefore important to address the difficult question of the degree to which federal aid will help in the city's recovery. The city is awaiting a final accounting of the unreimbursed losses before it can know with certainty what proportion of the losses the federal aid will offset. Nevertheless, a recent agreement among federal, state, and city officials should greatly

increase the flexibility in the allocation of federal aid for rebuilding. Specifically, roughly \$9 billion has been set aside by the Federal Emergency Management Agency (FEMA) and earmarked for specific functions related to site cleanup, including debris removal, restoration of damaged public facilities and equipment, and police and fire department overtime. According to the New York City Independent Budget Office (2002), this overall funding allocation is likely to be far greater than the unreimbursed cleanup losses, including the cost of restoring damaged facilities and equipment, which are now estimated to be more on the order of \$3 billion. Under the recent agreement, part of the remaining \$6 billion of FEMA assistance can now be redirected to help rebuild and improve the entire transportation infrastructure in Lower Manhattan, including such projects as a new PATH terminal and a new transit center that would connect to the terminal and link the downtown subway lines. The use of FEMA funds for transportation projects that go beyond the repair and restoration of damaged facilities is unprecedented.

These issues point to the third challenge facing city policymakers: to apply federal funds in the most efficient way possible to maximize their return. Overall, the federal aid package seems likely to cover the rebuilding costs of the physical facilities lost on September 11. There may even be sufficient funds, if applied judiciously, for Lower Manhattan to transform itself into an even more appealing location than it was on September 10. The proposed transportation improvements, for example, could make Lower Manhattan a more desirable place for businesses, while subsidies to residential development could enhance the neighborhood's various amenities.

LAND PRICES SUGGEST A POSITIVE ECONOMIC OUTLOOK

In conjunction with the model, we can gain insight into the city's longer term economic outlook by examining land prices.¹² Although these prices cannot be observed directly, the selling prices of houses, apartments, and commercial properties can serve as a rough proxy.

In the days and weeks immediately following the terrorist attack, there was widespread concern that large numbers of people would no longer want to live in New York City. As it turns out, following a brief but sharp dip in September and October, housing markets in New York City's nearby suburbs, the outer boroughs, and even Manhattan are reported to have rebounded strongly (Bram, Orr, and Rapaport 2002). As

shown in Chart 3, the selling prices of existing homes throughout the metropolitan area have continued to rise, not only in absolute terms, but also relative to the national average. These results suggest that the terrorist attack thus far has had little if any negative effect on land prices, even in areas close to the World Trade Center.

Manhattan's office market, however, has been more mixed. The rental market has clearly been weak: at midyear 2002, office vacancy rates were reported to be sharply higher than

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they were a year earlier and rents were reported to be sharply lower. However, the buyer's market for office property continued to be characterized as strong, again suggesting underlying strength in land prices.

Thus, conditions in New York's important property markets currently appear to reflect continued strong demand. To the extent that business and household evaluations of a location's prospects are reflected in bids, New York City's land markets suggest a very positive indicator for the city. Naturally, market participants are operating with very limited information about the future. Yet it appears that, from what they know, firms and households still view New York as an attractive location. Going forward, the strength of the city's property markets will be an important barometer of its economy.

CONCLUSION

Economic growth in New York City for most of the past three decades has been characterized by a transformation of employment from relatively low-paying jobs to increasingly higher paying ones—that is, overall employment levels have remained roughly constant but real earnings levels have risen both in absolute terms and relative to the nation.

In light of the destruction that occurred on September 11, several downside risks to the city's economic growth prospects have arisen. The worst-case scenario includes the possibility that financial firms located in Lower Manhattan will leave the city, which could generate a cumulative downward spiral of job and income growth.

In assessing this and other potential risks to New York, we examined the city's economic position with respect to several key growth fundamentals prior to September 11. We found that New York's industrial mix, which is weighted toward high-growth sectors, along with the city's attractiveness to workers and firms, point to favorable prospects for growth. However, whether these conditions translate into actual growth going forward depends to a large degree on the city's policy response

to the economic pressures arising from the terrorist attack. The main elements of this response will be the ability to manage relatively large budget deficits and rebuild New York City's damaged and destroyed infrastructure—while maintaining the productivity of the capital stock. Addressing the latter issue will require a vision of Lower Manhattan's role in the overall city economy as well as an efficient allocation of the anticipated federal aid.

ENDNOTES

1. By “relative,” we mean in comparison to other locations within the broad capital and labor market. In practice, the nation is a sensible benchmark, as national labor supply is relatively inelastic. Capital may be more elastically supplied at the national level, but in this context we take the national supply of capital as given.

2. This conclusion is also based on the assumption that higher prices of constant-quality housing reflect growth in demand for the land on which a house sits or for durable capital in place there, and that firms and households are competitors in the land market.

3. See Harrigan and Martin (2002) and Quigley (1998) for discussions of the local benefits of industry concentrations.

4. For example, for evidence on city schools’ math test scores, see New York City Department of Education (2002).

5. Because of improvements in the relative skill level of New York City employers and residents over time, we must be cautious in interpreting any income data. If the local skill-adjusted wage is higher than it is elsewhere, it can be interpreted as evidence that firms are willing to pay relatively more to workers here, implying that these workers are more productive when they work in New York.

6. See Harrigan and Martin (2002).

7. Data refer to all persons twenty-five years of age and older. City data are from the U.S. Census Bureau (1991, 1999); national data are from

the U.S. Census Bureau (2002). In 1991, the city’s college-educated share of the population was 22.1 percent, while the national share was 21.3 percent in 1990 (U.S. Census Bureau 1991, 2002).

8. The lower figures in the range (for both years) are from the New York City Office of the Comptroller (2001); the higher figures are May 2002 estimates from the New York City Office of Management and Budget, as reported by the U.S. General Accounting Office (2002).

9. Haughwout and Inman’s data are for 1992 and should thus be viewed as illustrative of the order of magnitude of the September 11 attack.

10. The value-of-time estimate as half the gross hourly wage is standard in the urban transportation literature; see Small (1992).

11. These calculations exclude the additional out-of-pocket cost to New Jersey commuters, as these amounts are transfers to regional transportation authorities. Lost time, however, is gained by no one. Present-value calculations assume 3 percent real discount and 2 percent depreciation rates.

12. Bram, Orr, and Rapaport (2002) discuss current economic indicators since the attack in order to assess short-term prospects.

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