

The Economic Aftermath of Hurricane Katrina

Jacob Vigdor

On August 29, 2005, Hurricane Katrina swept north from the Gulf of Mexico into the states of Louisiana and Mississippi. The winds, rain, and coastal storm surge associated with this storm caused considerable destruction. Beyond these typical effects, Katrina began a chain reaction that led to the near-total abandonment of a major American city. New Orleans, a city built largely on land reclaimed from swamp, witnessed massive failures in the system of levees designed to protect the city from the waters that surround it. Much of the city and its surrounding suburbs were inundated; those residents of the city who had not heeded warnings to flee the approaching storm were evacuated in its wake. In less than a week, the city's population declined from over 400,000 to near zero. Census Bureau estimates indicate that almost two years after the storm, by July 1, 2007, nearly half of these evacuees had yet to return.

Will the future New Orleans bear any resemblance to the city that existed prior to Katrina? Most government authorities, from city officials to federal spokespersons, insist that New Orleans must—and should—be fully rebuilt. Many environmental scientists question whether such a rebuilding would be sensible, given the city's precarious geological position and the contribution of past land reclamation to the city's current vulnerability. The more basic positive question of whether the city will come back, however, is fundamentally an economic one. After Hurricane Katrina, will the city of New Orleans continue to be a preferred location for more than 400,000 residents and their employers? Or will the disaster shift the city to a new equilibrium level of employment and population?

■ *Jacob Vigdor is Associate Professor of Public Policy Studies and Economics, Terry Sanford Institute of Public Policy, Duke University, Durham, North Carolina. He is also a Faculty Research Fellow, National Bureau of Economic Research, Cambridge, Massachusetts. His e-mail address is <jacob.vigdor@duke.edu>.*

Historical evidence suggests that cities can rebound from disasters. Figure 1 shows the population trajectories of several cities struck by natural or man-made disasters over the past 150 years. With one exception, these prominent case study cities returned to their pre-disaster population trends.

The Chicago fire of 1871 burned about 1,700 acres in the heart of the city, leaving more than 100,000 inhabitants homeless in a city that counted 300,000 inhabitants in the prior year's Census (Cronon, 1991). By 1880, the city had not only rebuilt homes for those 100,000 inhabitants, it had also welcomed 200,000 new residents, bringing its total population to more than half a million. The San Francisco earthquake of 1906 was proportionately even more devastating—more than half the city's population was left homeless—yet the city of 400,000 that witnessed it had surpassed that level of population by 1910 (National Oceanic and Atmospheric Administration, 1972). As Figure 1 illustrates, both cities were in the midst of periods of steady growth when disaster struck.

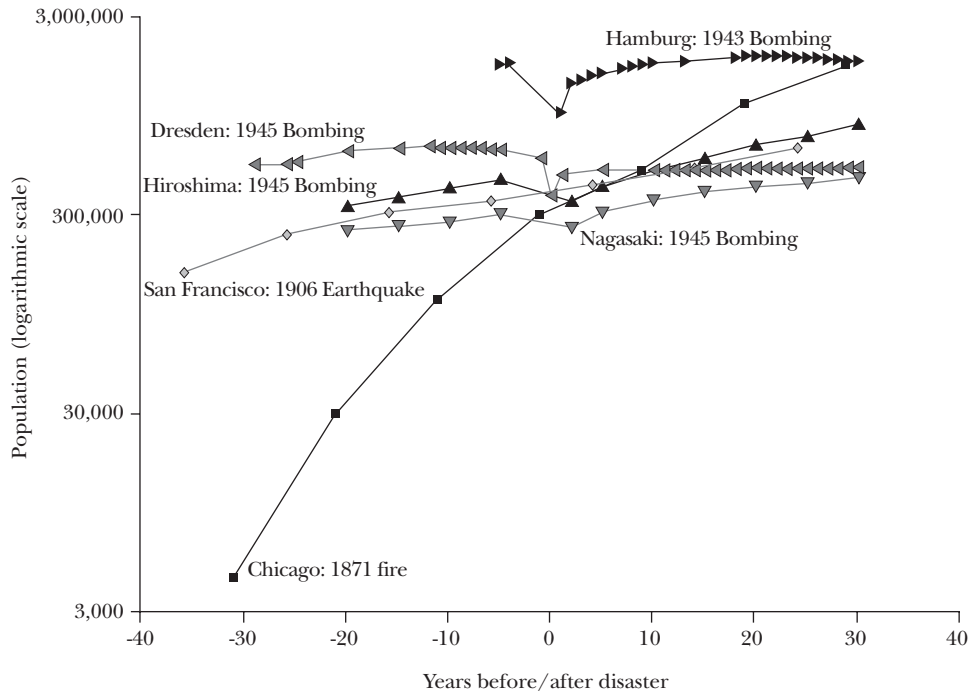
World War II witnessed unprecedented destruction of cities and civilian targets in both Europe and Japan. Davis and Weinstein (2002) evaluate the impact of Allied bombing in Japan, which destroyed nearly half of all buildings in a set of 66 cities, leaving 40 percent of the population homeless. They conclude that these shocks to population were entirely reversed by 1960. Figure 1 replicates their evidence on the return of Hiroshima and Nagasaki to their prewar growth trajectories—by 1960 in the case of Nagasaki, and by 1975 for Hiroshima. Once again, note that both cities experienced upward trends in population in the decades immediately prior to their devastation.

Some European cities experienced similar rebounds. Intense allied bombing raids on Hamburg in the summer of 1943 destroyed nearly half of the city's housing, yet roughly two-thirds of all evacuees had returned by 1946, and the city's population surpassed its prewar level by the early 1950s (Ikle, 1951). Again, Hamburg enjoyed steady growth in the period prior to the war.¹ Dresden, another allied bombing target, is the sole example in this set of case studies that fails to exhibit a complete rebound to pre-disaster population levels or trends. Home to 630,000 inhabitants at the outbreak of World War II, Dresden's population stabilized at around 500,000 within a few years after 1945. Tellingly, Figure 1 shows that Dresden, unlike the other examples, was experiencing negative population growth in the period immediately before the disaster. This pattern foreshadows the experience of New Orleans and Hurricane Katrina.

Beyond these mostly encouraging historical examples, there is one additional rationale for expecting recovery in New Orleans: the existence of a formal government disaster assistance program. Government intervention in the wake of disaster has occurred on an ad hoc basis for centuries, but a formal mechanism for disaster relief in the United States was not established until the Federal Disaster Act of 1950. In 1979, federal emergency preparedness and relief efforts were consolidated in a

¹ The city of Hamburg consolidated with several outlying municipalities in 1938, which makes it difficult to trace population for a consistent area before that date.

Figure 1
Disasters and City Population Trends



single agency, the Federal Emergency Management Agency (FEMA). In theory, a formalized national system of disaster relief serves as a form of insurance, increasing the likelihood that a disaster-struck local area will have resources available to undertake rebuilding efforts. Some evidence suggests that government action can assist a city's recovery from disaster: for example, Davis and Weinstein (2002) report that postwar growth trends were modestly more positive in Japanese cities that received more relief spending per capita.

But in spite of the historical examples of recovery cited above and the emergence of a federal disaster bureaucracy, the likelihood that New Orleans will regain its pre-evacuation population appear slim. As noted above, each of the cities cited as recovering successfully from disaster did so either at the end or in the midst of a historic boom. New Orleans, by contrast, has been a city in decline for quite some time. Its peak of relative importance was in 1840, when six of every thousand residents of the United States lived in the city. Its absolute population peak occurred in 1960. The decline of New Orleans pre-Katrina was more rapid than the decline of Dresden prior to World War II.

Pre-fire Chicago, pre-earthquake San Francisco, and prewar Hamburg grew rapidly because the production technology in place at the time provided a compelling economic rationale to locate in the city. Destruction of the cities' physical infrastructure did not alter the compelling economic rationale. New Orleans, by

contrast, is a city whose original economic rationale—as a river port at the mouth of the continent’s largest watershed—has been greatly diminished in an era where transportation by rail, truck, pipeline, and container ship has rendered the river barge largely obsolete. Glaeser and Gyourko (2005) offer an argument explaining the persistence of obsolete manufacturing cities that applies equally well to New Orleans: cities whose economic justification has declined or disappeared persist for quite some time largely because an excess supply of housing keeps the cost of living low, effectively compensating residents for a lack of economic opportunity. Hurricane Katrina has brought an end to the era of abnormally cheap housing in New Orleans. Absent a massive effort to subsidize the reconstruction of housing units in an ecologically frail landscape, the city will not regain its former size. The lessons of disaster recovery in initially booming cities do not apply: temporary shocks may have little long-run impact in growing cities, but they fundamentally change the fate of declining cities. Hurricane Katrina appears destined to have caused greater population loss after the damage of a single day than the city of New Orleans had witnessed over 45 years of slow decline.

This article proceeds first by describing the trajectory of New Orleans through August 2005, and then by reviewing Hurricane Katrina’s impact on the city’s population, housing, and labor market. The article closes with a discussion of the efforts that would be required to return the city to its initial size.

The Pre-Katrina Equilibrium in New Orleans

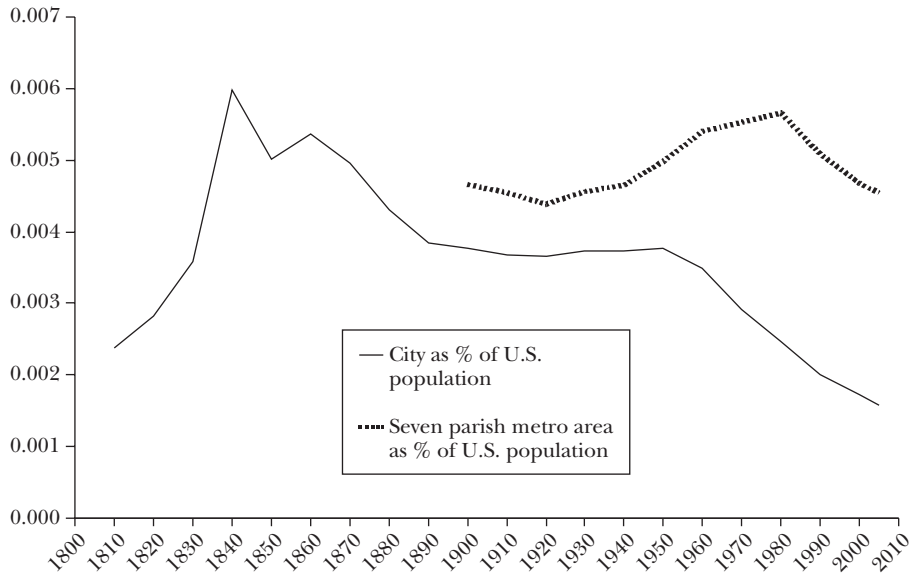
The peak of New Orleans as a magnet for population in the United States occurred in 1840, at which time the city was effectively tied with Baltimore as the nation’s second largest city. Six of every thousand American residents lived in the city; today only the nation’s four largest cities match that relative magnitude. The New Orleans metropolitan area—counting the city and six surrounding county-equivalents, or “parishes” in Louisiana terminology, would never again reach this level of relative prominence. Figure 2 displays the ratio of population in the city of New Orleans to the population of the United States from 1810, the first Census that included territories acquired in the Louisiana Purchase, to July 2005.

The importance of New Orleans was tied to its location near the mouth of the Mississippi River. The city collected the output of midwestern farms and southern cotton plantations, and received imports destined for many of the same locations. In part because of the asymmetric cost of river transportation (downstream is far cheaper than upstream), the importance of the Mississippi river system declined as more direct canal and rail routes from the Midwest to the East Coast developed through the nineteenth century. Secession and Civil War served to further weaken the city’s role as a center for export and import. By 1890, fewer than four in every thousand American residents lived in New Orleans.

Although the city declined in relative magnitude after 1840, the city managed to continue growing in absolute terms, notably between 1890 and 1950, when the

Figure 2

New Orleans' Share of U.S. Population, 1810–July 2005



city's growth kept pace with that of the nation as a whole. During this period of growth, many of the low-lying wetlands surrounding the historical core of New Orleans along the banks of the Mississippi were filled in, in the process eliminating a major natural protection against tropical storm surges. Figure 2 also shows that, like many American cities, the growth of the suburbs of New Orleans outpaced that of the city itself beginning in the 1920s. The Office of Management and Budget now defines the New Orleans Metropolitan Statistical Area as a region reaching from the city center 85 miles southeast to the mouth of the Mississippi River, plus another 50 miles upstream to the west, 32 miles to the state border with Mississippi in the northeast, and 50 miles inland across Lake Ponchartrain to the north. This vast region, which consists largely of uninhabited wetland, added population at faster than the national average for 30 years, even as the central city at its core declined.

New Orleans is certainly not the only American city that rose to prominence as a port only to watch technological innovation reduce its importance; for example, Glaeser (2005) makes the same observation about Boston. Many of these port cities transformed into centers of industrial production in the late nineteenth century. Such a transformation did not occur in New Orleans; the city was largely left out of the industrial revolution. A number of factors can potentially explain this pattern. The skill level of the city's workforce was poor relative to many others. As of 1880, the adult literacy rate in New Orleans, as recorded by the U.S. Census, was under 80 percent; the emerging manufacturing centers of the Northeast and Midwest generally had adult literacy rates above 90 percent. The manufacture of river-going

vessels concentrated at points further upstream, and the production of ocean-going vessels remained centered on the East Coast. The region's flat topography implied that water power, which drove much industrialization in New England, was a less practical option. Finally, the city's relatively remote southern location deprived it of the access to affluent markets in Europe and abroad that many northeastern manufacturing cities enjoyed.

In the second half of the twentieth century, many cities—particularly those that had witnessed industrial booms between 1850 and 1950—experienced a decline associated with the gradual erosion of manufacturing employment, along with the growth of suburbs as centers of population and employment. New Orleans, having undergone a slow relative decline for more than a century, began its absolute decline in the 1960s. Some portion of the absolute decline of the population of New Orleans reflects the general phenomenon of “white flight” that occurred following the effective integration of public schools in cities nationwide. In recent decades, however, the population declines of New Orleans have transcended racial groups. Since 1980, the entire metropolitan area, not just the central city, has grown more slowly than the nation as a whole, with negative population growth rates during the 1980s and the first half of the 2000s.

In the late twentieth century and the first decade of the twenty-first century, growing cities have often emphasized postindustrial “knowledge” industries as engines of economic growth. These industries, ranging from biotechnology, computer manufacture, and software design to professional services and finance, have never been strongly represented in the New Orleans metropolitan area. To summarize, there have been two major transformations in the economic rationale for urban growth in the United States since 1840, and New Orleans has missed both of them.

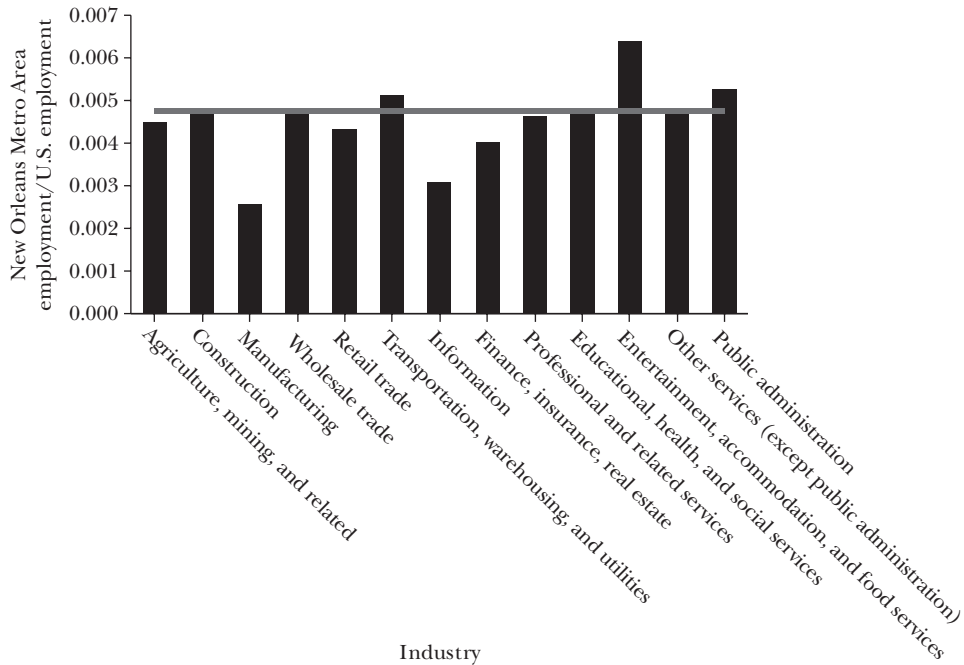
The consequences of this failure to transform can be seen in Figure 3, which compares the industry mix of the pre-Katrina New Orleans area workforce with that of the nation as a whole, and Table 1, which presents basic summary statistics describing the labor force in the metropolitan area and nation. Both rely on figures drawn from the 2000 Census, before Hurricane Katrina. Figure 3 shows the ratio of employment in the New Orleans metropolitan area to employment nationwide by broad industry group. Were the New Orleans area a perfect economic microcosm of the nation, each bar in this graph would be exactly the height of the thick horizontal line, which indicates the ratio of population in the New Orleans area to the national population.

The portrait in these statistics conforms to the narrative description above. In 2000, the New Orleans area had a pronounced deficit of jobs compared to the national averages in the manufacturing sector, in information-related industries, and in finance, insurance, and real estate. These shortages are substantial. There were 47,000 manufacturing employees in the New Orleans area in 2000; a metropolitan area of equal size but with a nationally representative employment mix would have had 87,000. Relative to this hypothetical metropolitan area, the New Orleans region had a deficit of over 6,000 retail sector jobs, over 6,000 information

Figure 3

Employment by Industry: New Orleans Metropolitan Area/United States

(horizontal line indicates the ratio of New Orleans population to total population in the United States)



sector jobs, over 6,000 jobs in the finance, insurance, and real estate sector, and more than 1,000 professional service sector jobs.

The New Orleans area is overrepresented in only three industries: the transportation sector, the entertainment sector (which includes accommodations and food service), and the public sector. The region's economic strength, such as it was, rested on the continued (though diminished) importance of its port and on the tourism industry. Relative strength in these industries, however, was not sufficient to overcome weakness in others when considering overall employment conditions. The New Orleans metropolitan area had a shortage of roughly 37,000 jobs in 2000—that's how many jobs it would have taken to make the area's civilian employment-to-population ratio equal the nation's. Moreover, the area's employment was concentrated in lower-paying sectors, and sparse in those sectors associated with the strongest growth in twenty-first century America.

Table 1 verifies these conclusions in a comparison of basic labor market statistics for the New Orleans metropolitan area and the United States as a whole. Relative to the nation, the New Orleans region featured a lower rate of labor force participation, a higher unemployment rate, and a lower frequency of full-time employment among those employed. Median household income was more than

Table 1

Labor Market Statistics for New Orleans Metropolitan Area and United States, 2000 Census

	<i>New Orleans Metropolitan Area</i>	<i>United States</i>
Labor force participation rate, persons age 16 and over	61.2%	63.9%
Unemployment rate	4.1%	3.7%
Proportion of employed persons working at least 35 hours/week, at least 50 weeks/year	57.8%	58.3%
Proportion of households with wage or salary income	76.9%	77.7%
Median household income in 1999	\$35,517	\$41,994
Poverty rate	18.4%	12.4%
Percent with income below 50% of the poverty line	9.3%	5.6%
Percent of adults over 25 without a high school diploma	22.3%	19.6%

Source: 2000 Census of Population and Housing.

\$6,000 below the national average; both the poverty rate and the proportion of individuals residing in households with income below 50 percent of the poverty line were roughly half again as large as the national figure. Many of these statistics reflect the low human capital levels of the area's residents; educational attainment levels were generally below the national average. Each of these economic maladies was concentrated in the city of New Orleans itself; the city's median income in 1999 was only \$27,000, and the poverty rate was 28 percent—more than twice the national average.

The economic difficulties of pre-Katrina New Orleans were also reflected in the housing market. The American Housing Survey periodically conducts a detailed analysis of individual metropolitan areas across the country, and completed such a local enumeration in New Orleans in 2004. In that year, the median owner-occupied home in New Orleans was worth about \$120,000, and the median size for owner-occupied homes was 1,800 square feet. This implies a price per square foot of \$67, substantially below most reasonable estimates of construction costs for housing of standard quality, let alone housing built to withstand the impact of hurricane-force winds and flooding. The pricing of housing below marginal cost is a feature common to many areas experiencing negative population growth and can be attributed to the durability of housing built in happier economic times (Glaeser and Gyourko, 2005). Houses were in excess supply in pre-Katrina New Orleans, which kept housing prices low.

The effects of Hurricane Katrina extended beyond the New Orleans metropolitan area, to the Mississippi Gulf Coast. The Gulfport-Biloxi area, represented by the two coastal counties in Mississippi that are closest to the Louisiana border, enjoyed robust population growth over much of the twentieth century, doubling its share of the national population between 1920 and 1980, and posting a more modest gain relative to the nation thereafter. The striking differences in growth trajectories between the Mississippi Gulf Coast and the New Orleans regions can be

attributed in large part to simple geography. Whereas southeastern Louisiana is dominated by the Mississippi River Delta and its vast wetlands, the coast of Mississippi consists largely of sandy beachfront. The development of this beachfront for recreational use drove the region's quadrupling of population between 1940 and 2005. The strengths of Gulfport-Biloxi relative to the New Orleans area can be seen in both the labor and housing markets. A graph equivalent to Figure 3 for the Mississippi Gulf Coast region would reveal only three sectors with a relative deficit of jobs, compared to six in the New Orleans area. While the high frequency of seasonal properties in the Gulfport-Biloxi region make it difficult to directly compare housing market statistics, as of 2000 the median housing unit along the Mississippi Gulf Coast was just 25 years old, compared with 32 years in the New Orleans area. Although the Mississippi Gulf Coast has been a growing region, it is still relatively poor. In 1999, the area's median income was well below the national average, and its poverty rate 1.5 percentage points above the national level. These difficulties reflect the nature of the tourism- and recreation-based regional economy. Like New Orleans, the greatest relative concentration of jobs in the Gulfport-Biloxi area was in the relatively low-paying entertainment sector.

In summary, before Hurricane Katrina made landfall, the greater New Orleans area was a region with growth confined to the periphery and profound decay at its core. Particularly for the residents of the central city, there was a shortage of economic opportunity, and what opportunities existed were concentrated in industries with little potential for long-term advancement or productivity growth. For residents, this lack of opportunity was offset to a large extent by the low cost of living, driven by excess supply in the housing market. Continued out-migration from the city, however, suggests that the lack of job opportunity was not fully offset for the remaining population.

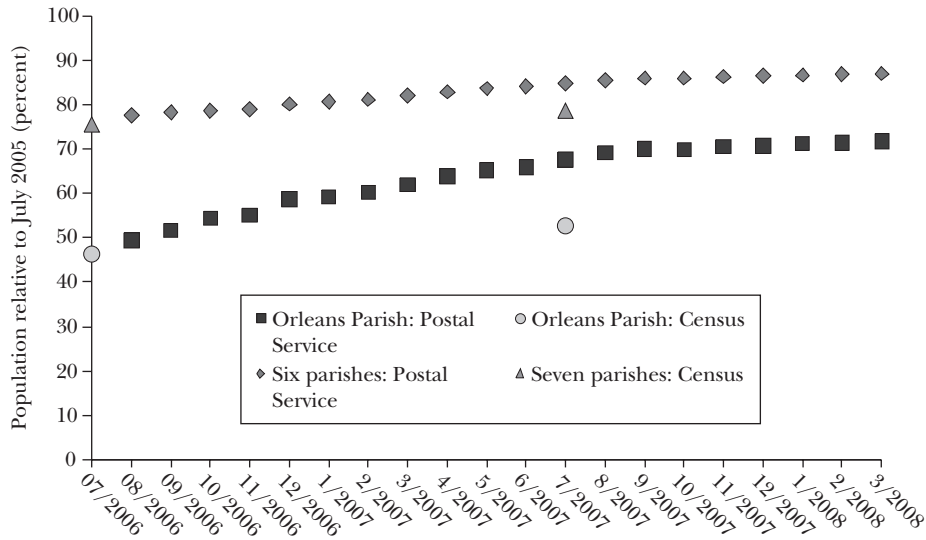
Hurricane Katrina disrupted this initial equilibrium by forcing residents to leave New Orleans, by shuttering most places of work, and by destroying a large proportion of the housing stock. The following three sections describe the post-landfall recovery of population, the housing market, and the labor market.

Katrina's Impact on the Population of New Orleans

The initial impact of Hurricane Katrina on the population of New Orleans involved a near-total evacuation of the city. The rate of recovery since is uncertain and a matter of some dispute. Figure 4 shows the path of recovery using two different data sources: official Census Bureau population estimates and a second estimate derived from U.S. Postal Service information on the number of households actively receiving mail.² According to both sources, the population of the city

² After Hurricane Katrina, regular delivery of mail ceased in the New Orleans area. Returning residents were instructed to notify their local post office when they were ready to continue receiving mail at their pre-evacuation address.

Figure 4
Population Trends in the New Orleans Area Post-Katrina



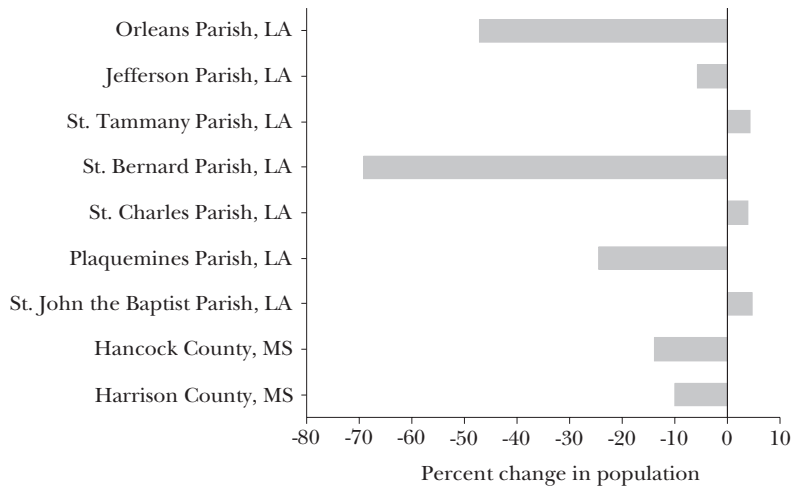
itself stood at just under half the July 2005 level of 453,000 in the summer of 2006. The relative impact on the entire metropolitan area was more modest, with population a year after the hurricane between 75 and 80 percent of its July 2005 level.

According to the Postal Service data, the city's population continued to rebound over the next two years, to a level between two-thirds and three-quarters of the pre-evacuation population. The metropolitan area appears to have converged to roughly seven-eighths the pre-evacuation level. This monthly time series corresponds poorly to the official Census estimates; the Census estimates suggest that the city's population persisted at just over 50 percent of the pre-Katrina level for at least the first half of 2007. Officials in Orleans Parish, the county-equivalent unit of government coterminous with the city of New Orleans, have requested a formal review of this estimate from the Census Bureau.

A review of other independent indicators, however, suggests that the Census Bureau numbers are closer to reality. Public school enrollment in Orleans Parish fell by slightly more than half between fall 2004 and fall 2007. Private school enrollments declined over the same time period. Transit ridership has decreased by more than two-thirds. The Postal Service data may inflate the rate of repopulation to the extent that continued repair and rehabilitation of the housing stock has decreased the average number of individuals residing at a single address.

There is less dispute over the fact that, as of mid 2008, the flow of population back to the city of New Orleans and the surrounding area had fallen very close to zero. If Census Bureau estimates prove accurate, the city will have lost roughly 200,000 residents as a result of Hurricane Katrina. A population loss of this

Figure 5
Change in Population, July 1, 2005–July 1, 2007



magnitude would exceed the reduction of 175,000 during the city's period of slow decline from 1960 to 2005.

Figure 5 displays population change estimates between July 2005 and July 2007 for the nine parishes and counties at the core of the region affected by the hurricane. Orleans Parish, coterminous with the city of New Orleans, lost nearly half its population. Two Louisiana parishes downstream from the city, St. Bernard and Plaquemines, lost 70 and 25 percent of their residents respectively. Losses in other nearby areas, including the two Mississippi Gulf Coast counties, were more modest. Three suburban parishes actually posted gains in population over this time period. All three of the growing parishes are either upstream from New Orleans or further inland, across Lake Pontchartrain.

Hurricane Katrina changed not only the size but the composition of the city's population. Table 2 shows Census estimates derived from the 2006 American Community Survey. These estimates indicate that post-Katrina New Orleans has a smaller share of African-American residents, though the city remains majority black. The Hispanic population has increased slightly. The population has become if anything slightly more economically disadvantaged, as the proportion of adults without a high school diploma increased slightly between 2004 and 2006.

The city is substantially older; the median age in 2006 is nearly six years older than the comparable figure for 2004, and school-aged children form a smaller proportion of the population. In spite of the fact that the proportion of children in the population has declined, the average household size has increased, as reduction in the housing supply has forced adults to share living quarters with a larger number of fellow adults, on average. This pattern is consistent with the view that the more optimistic population rebound numbers offered by postal service mail deliv-

Table 2

Demographic Shifts in New Orleans after Hurricane Katrina

	2004	2005	2006
Percent black	68%	68%	59%
Percent Hispanic	3%	3%	4%
Percent of adults without a high school diploma	18%	18%	19%
Median age	34.8	35.2	40.6
Percent age 5–17	19%	18%	15%
Average household size	2.46	2.68	2.89

Source: American Community Survey (ACS).

Note: The American Community Survey is conducted over the course of a year, thus the 2005 sample is neither a pure pre- or post-evacuation sample.

ery statistics reflect movements into independent households within the city, rather than moves from outside the city to within.

Katrina's Impact on the Housing Market

The 2000 Census counted just over 215,000 housing units in the city of New Orleans. By 2006, the estimated number of units had declined to 106,000, of which more than 32,000 were vacant.³ Although these vacant units appeared intact from the exterior, most of them undoubtedly required significant interior rehabilitation prior to occupation. Hurricane Katrina thus rendered two-thirds of the city's housing stock uninhabitable, at least in the short term. Outside the city itself, Census estimates indicate that an additional 12,000 housing units were lost and 50,000 left vacant in the suburban portion of the New Orleans metropolitan statistical area as of 2006. In the Gulfport-Biloxi area, Census estimates suggest a loss of nearly 10,000 housing units, with an additional 5,000 left vacant. The larger proportional reduction in the housing stock in the city relative to the suburbs likely reflects several factors. The damage within the city was caused primarily by unanticipated flooding that lasted for several days, while other areas were affected by wind and storm surge that had been forecast many hours in advance and that lasted for only a few hours. Even if all residents of the area had been equally warned of the potential damage to their property, fewer precautions were available against catastrophic flooding relative to wind damage and storm surge. Households in outlying areas may have been more likely to carry insurance against their losses and may also have had earlier access to claims adjusters.

³ This latter figure comes from the 2006 American Community Survey. In conducting the ACS, the Census Bureau excludes from the official enumeration housing units that are "open to the elements" or have indications that they are condemned or slated for demolition.

In the city of New Orleans, the proportionate reduction in the housing stock exceeded the reduction in population, according to Census estimates. Predictably, then, as the reduction in supply exceeded the reduction in demand, the price of housing in New Orleans rose dramatically in the hurricane's wake. As noted above, the 2004 American Housing Survey indicated a median owner-occupied value of \$120,000 in the New Orleans metropolitan area. American Community Survey data for the same year indicate that the median house price for owner-occupied units in Orleans Parish was slightly higher, at \$131,000. The median cost of renting, including contract rent and utilities, was \$566 in 2004. In 2006, the ACS reported a median value of \$208,500 for houses in Orleans Parish, a 59 percent increase in two years. Median rent rose to \$838, a 48 percent increase in the same time period. Fair market rents, set by the Department of Housing and Urban Development as the maximum permissible amount for a housing voucher for eligible households in a metropolitan area, increased by 42 percent between 2004 and 2006, and have continued to climb since.

Will the housing market return to its initial equilibrium? At first glance, there are some promising signs. The city of New Orleans has issued more than 57,000 residential building permits since Hurricane Katrina made landfall, excluding permits for demolition. More than 60,000 city homeowners applied for the Road Home program, which made grants of up to \$150,000 available for the rehabilitation of properties. About three-quarters of these applicants stated an intention to re-occupy their property.

But upon further inspection, and considering the simple economics of the initial equilibrium, a return to pre-2006 housing price levels seems unlikely. The 57,000 building permits represent less than half of the housing units damaged or destroyed by Katrina in Orleans Parish. Moreover, some of these permits were likely issued for housing units that were already occupied by 2006 and hence not included in the count of damaged or destroyed units. The rate of permit issuance has declined dramatically; 47,000 were issued by the end of 2006, and only 9,151 were issued in calendar year 2007.

While government subsidies may help homeowners rebuild, programs for landlords and renters appear to be less aggressive. The rental housing stock in New Orleans took a larger hit to begin with: the number of renter-occupied units declined by 63 percent between 2004 and 2006, versus a 56 percent decline for owner-occupied units. The Road Home program does include a rental unit program, but as of February 2008 the program's commitments figured to produce just under 13,000 rental units in the entire New Orleans metropolitan area.⁴ Roughly 60,000 rental units were rendered uninhabitable in the city alone.

Left to its own devices, the New Orleans housing market will not return to its earlier pre-Katrina equilibrium. Remember that the cost of New Orleans housing, pre-Katrina, was below the replacement cost of new construction. A complete

⁴ This figure derived from the Road Home small rental property program webpage, (<http://www.road2la.org/rental/default.htm>), accessed on May 21, 2008.

restoration of pre-Katrina housing prices would require builders to operate at a loss. A program of substantial government subsidy, larger and more comprehensive than even the Road Home program, would be necessary to induce such a quantity of building behavior. The Road Home program to date has expended more than \$6 billion.

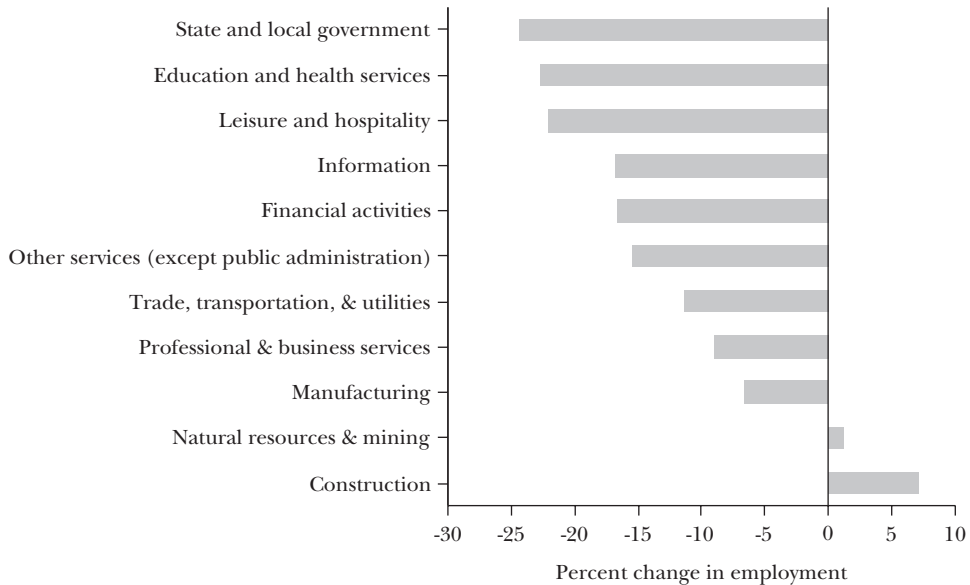
A final signal that housing prices are not likely to descend back to their pre-Katrina levels can be inferred from the relation of housing price increases to rent increases. In equilibrium, the price of a unit of housing should be proportional to the discounted stream of rents the owner could expect from renting that unit. Were the elevation of rents attributable to a temporary shortage of housing, one would expect rent increases to outpace price increases—because potential homebuyers would be expecting lower rents in the future. The fact that median owner-occupied housing prices grew significantly faster than median rent, in spite of the fact that there was a greater proportional loss of rental housing, suggests that buyers expect further increases in market rents in the future.

Pre-Katrina New Orleans was a city where a lack of opportunity was offset to some extent by low living costs generated by an excess supply of durable housing. The excess supply of housing is now gone, and absent unprecedented government intervention in the housing market, it will not return. To return to its pre-Katrina size, then, New Orleans must establish itself as a location of greater opportunity, for both employers and workers. The following section searches for signs of such an economic revival.

Katrina's Impact on the Labor Market

Hurricane Katrina reduced both the number of workers and the number of firms operating in the city of New Orleans. In the second quarter of 2005, 9,592 employers based in Orleans Parish filed wage and salary reports with the state unemployment insurance agency. Two years later, the number of filers had declined by more than 2,000. Proportionately smaller declines were recorded in the suburban areas surrounding the city, once again likely reflecting differences in the nature of destruction and disparities in the proportion of losses covered by insurance. The payroll of private-sector firms located in the New Orleans metropolitan area declined 13.6 percent between July 2005 and July 2007, reflecting a loss of almost 70,000 jobs. Figure 6 shows that the largest proportional reductions in employment occurred in service-related industries, which presumably contracted in size along with the population they serve. Sectors less explicitly tied to local population, including the transportation and manufacturing sectors, posted comparatively smaller losses. The strongest performing industry in terms of jobs, understandably, has been construction. Natural resource-related firms have also expanded employment slightly, in all likelihood reflecting the effect of continuous oil price increases on a region close to productive oilfields in the Gulf of Mexico.

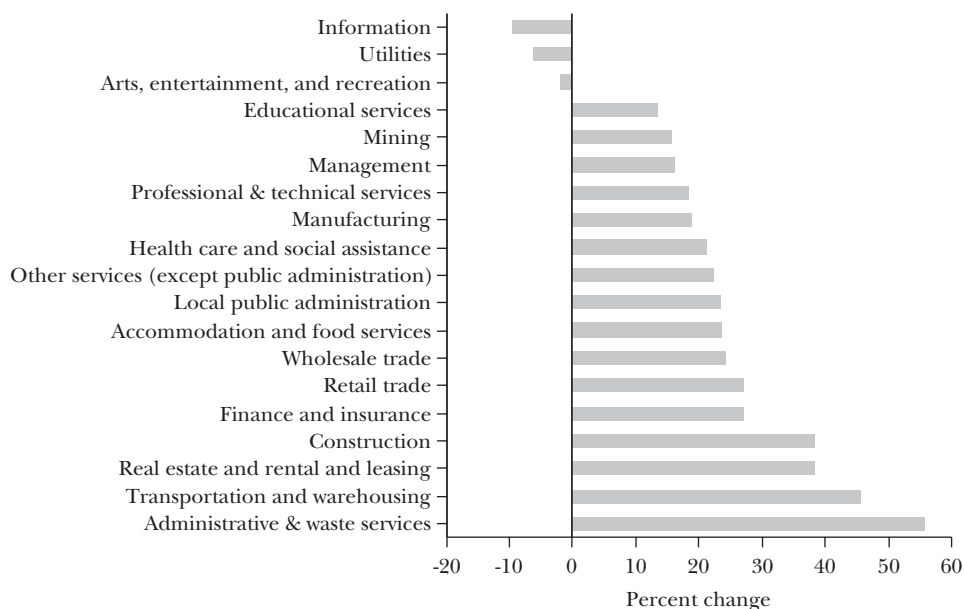
Figure 6

Relative Employment Losses by Industry: New Orleans Metropolitan Area, 2005–2007

Several independent pieces of evidence indicate that across the metropolitan area, the Katrina-induced reduction in the supply of labor outpaced the reduction in demand. Unemployment rates spiked in the first few months after landfall, but have persisted at below the national average every month since September 2006 (Liu and Plyler, 2008). Average weekly wages paid by firms located in the metropolitan area, derived from quarterly filings to the unemployment insurance program, increased by 21 percent between the second quarter of 2005 and the second quarter of 2007—more than twice the rate of increase posted in the nation as a whole. The rate of increase was even higher among firms located in Orleans Parish. Current Population Survey data confirm that worker experiences in the post-Katrina New Orleans labor market have been relatively favorable (Vigdor, 2007). As Figure 7 shows, however, these gains were uneven across industry sectors. Wages increased most rapidly in sectors associated with demolition, construction, and turnover in the housing market. Workers in the accommodation and food service industries posted strong gains, but those in the tourism-related arts, entertainment, and recreation industry posted absolute losses.

Given the magnitude of housing price increases and wage increases in New Orleans, does it make sense for a marginal evacuee to return to the city? On average, evacuees who have not returned to their pre-Katrina address have not done very well in the labor market. Between November 2005 and October 2006, the Current Population Survey asked respondents nationwide if they were Hurricane Katrina evacuees. Although the number of adult respondents who reported having evacuated is no more than a few hundred, this sample does permit some analysis of

Figure 7

Percent Change in Average Weekly Wage, 2Q2005–2Q2007*(firms located in Orleans Parish)*

the fate of evacuees who did not return to New Orleans. I found (Vigdor, 2007) and Groen and Polivka (2008) also show that long-term evacuees fared quite poorly in the labor market, with only weak evidence of progress even as late as October 2006.

But consider a hypothetical evacuee employed in the accommodation and food service industry prior to evacuation, whose earnings are equivalent to the average for that industry in Orleans Parish. After deducting 7.65 percent of these earnings for payroll taxes to support Social Security and Medicare, this evacuee would have had \$791 to spend after paying rent on the median apartment each month. In 2007, performing the same calculation leaves the evacuee slightly better off without correcting for inflation, at \$838 remaining after payroll taxes and median rent. This 5 percent nominal increase in post-housing-cost income is probably not sufficient to offset nonhousing inflation over the two-year period. Judging from the poor labor market outcomes of evacuees who have persisted outside the New Orleans area, however, it might well be difficult to find comparable opportunities in other cities.

This simple arithmetic varies for workers in different industries. Evacuees in the arts and entertainment industries, an industry with no nominal wage growth in New Orleans between 2005 and 2007, would clearly be worse off in returning; workers in the construction industry clearly better off. Moreover, as workers return to the New Orleans region, increasing both housing demand and labor supply, the higher price of housing and lower wage levels will make these calculations less favorable, absent a resurgence of new construction activity. Recall that the excess of

housing price growth over rent growth is consistent with the expectation that rental rates will increase rather than decrease in the long run.

What Will the Post-Katrina Equilibrium Look Like?

The city of New Orleans suffered severe damage to roughly two-thirds of its housing stock in the wake of Hurricane Katrina. While the entire region suffered ill effects from coastal storm surge and wind, the city was dealt the additional blow of multiple failures in its levee system, which left most of the city inundated long after the storm had passed. This profound shock to the city's housing supply will, in the long run, make New Orleans a more expensive place to live. This increase in the cost of living will, in turn, disrupt the fragile pre-Katrina equilibrium, where a lack of economic opportunity was offset by the fact that housing prices were substantially below construction costs. Setting aside the political or ecological arguments regarding whether New Orleans should be rebuilt, the plain economic reality is that its rationale for existence has been dealt an irreversible blow.

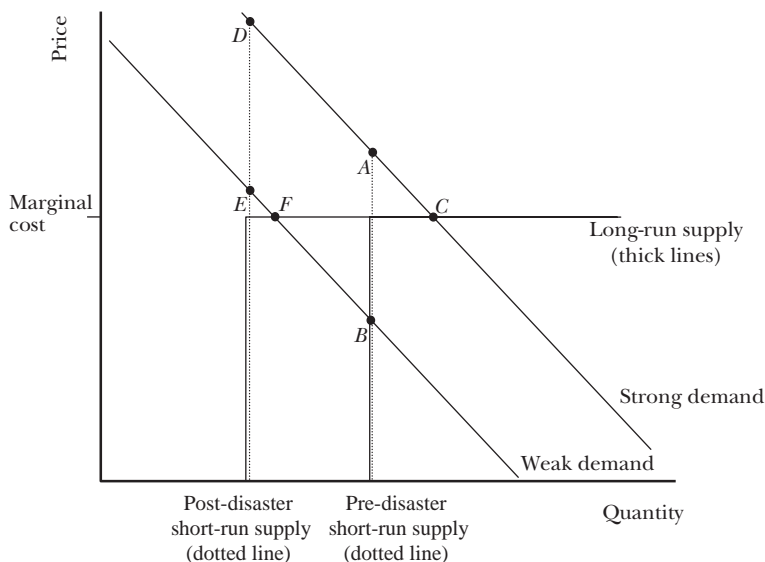
Why is New Orleans destined to depart from the post-disaster trajectories of places like Chicago or San Francisco? A city is analogous to any other good or service; there is a demand for residence in a certain location, and housing provides the supply. The stories of success after disasters tend to involve cities where demand was robust and growing when calamity struck. The elimination of supply did nothing to remove the underlying demand. In the wake of disaster, the excess of demand over supply created profit opportunities, which in turn fed rebuilding booms led almost entirely by the private sector.

When demand for a location declines, as was the case in Dresden just prior to World War II and in New Orleans for many decades prior to Katrina, the supply of housing does not always decline on the same time frame. Housing is a durable good, and the cost of transferring it from one location to another is prohibitively expensive. Declines in demand for workers in a city thus translate into some combination of reductions in population and reductions in housing costs. In pre-Katrina New Orleans, the price of housing had declined so far as to be below most reasonable estimates of replacement cost.

Figure 8 illustrates the impact of disasters on cities in varying degrees of demand, incorporating the insight that durable housing does not disappear when a city declines. The figure presumes that in the short run, the supply of housing in any location is fixed (see the dotted lines, indicating short-run supply). In the long run, the housing stock never declines below the current level, but can expand along a horizontal long-run supply curve that represents the marginal cost of building an additional housing unit. This implies that the long-run supply curve (indicated by the thick lines) turns a 90-degree angle where the current housing stock meets the marginal cost of construction.

Suppose there are two cities. In the first, demand is strong enough that consumers are willing to pay more than marginal cost for a unit of housing at

Figure 8

The Impacts of Disasters in Cities with Strong and Weak Demand

existing levels of supply. The initial market condition is represented by point *A*; we expect that builders will respond to this situation by expanding the housing stock, which will lead eventually to equilibrium at point *C*, the intersection of the long-run supply and demand curves. This outcome describes a city in the midst of a boom, much like late-nineteenth-century Chicago.

In the second city, demand was once strong but has since declined. With the housing stock fixed at its current level, demand is weak enough that the market price falls below the marginal cost of construction. Since the housing stock is immobile and the costs of construction are sunk, suppliers have little choice but to accept this low price. The equilibrium is represented by point *B*, the intersection of the long-run supply and demand curves. This is a city in decline, much like early twenty-first century New Orleans. Note that according to this model further decreases in demand will translate into still lower prices, rather than a reduced number of houses.

In either city, a disaster results in an instantaneous reduction in the short-run housing supply. Immediately after the disaster, before construction activity begins, price levels in both cities are much higher than before the disaster; the short-run equilibrium for the Chicago-style city is at point *D*; the New Orleans-style city rests temporarily at point *E*.

Very different things will happen to these two cities in the wake of a disaster. In the Chicago-style high-demand city, long-run equilibrium continues to be at the intersection of the demand and long-run supply curves, at point *C*. In other words, the disaster has no effect on the long-run equilibrium. In the New Orleans-style low-demand city, by contrast, the initial equilibrium point *B* is no longer attainable,

because it lies on a portion of the supply curve that no longer exists. There will be some reconstruction activity in this city, but the new long-run equilibrium is at point *F*, where the long-run supply and demand curves now meet. The city will now be smaller, and its housing more expensive, relative to the pre-disaster equilibrium.

To override this natural progression to a new equilibrium point would require a massive program of subsidy to distort the behavior of those who would otherwise choose not to rebuild in the city. Much of the political rhetoric heard in the aftermath of Katrina suggests support for just such a program, and some such programs already exist. The Road Home program, mentioned above, intends to subsidize the rebuilding process for thousands of homeowners and landlords, offsetting costs not otherwise covered by insurance payouts. In late 2005, Congress passed the Gulf Opportunity Zone Act, which extended favorable tax provisions to businesses operating in portions of Louisiana, Mississippi, and other states.

Will these efforts have a substantial impact on the post-Katrina equilibrium? Existing evaluations of geographically-targeted tax expenditure programs such as enterprise zones and empowerment zones have reached mixed conclusions (Bondonio and Engberg, 2000; Busso and Kline, 2008). The subsidy programs have undoubtedly transferred considerable resources from the federal government to inframarginal consumers and firms, but the actual impact of the policies on location decisions are uncertain.

New Orleans was, and continues to be, a city of unrivaled cultural heritage. The city's ability to retain this heritage through the centuries is, ironically, a reflection of its economic failure. New York, in the process of becoming a center of manufacturing and then a hub of the postindustrial economy, lost almost every vestige of its Dutch colonial origins. Aside from its name, modern San Francisco shows few traces of its years under Spanish rule. Because New Orleans did not industrialize, it had no reason to plow under its historical core. Because New Orleans did not grow, a large proportion of its current residents can claim ties to a colonizing nation that ceded jurisdiction more than 200 years ago. The argument that New Orleans is a precious cultural artifact is not tantamount to a claim that the city must be restored to its slowly declining former self. The political pressure to restore New Orleans is strong, but the economic pressure is nonexistent.

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