



CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

Douglas Holtz-Eakin, Director

September 29, 2005

Honorable Jim Nussle
Chairman
Committee on the Budget
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

As you requested in your letter of September 23, 2005, the Congressional Budget Office (CBO) has reviewed its estimates of the likely consequences of Hurricanes Katrina and Rita for the national economy, federal receipts, and federal outlays. The preeminent cost of the disasters is the tragic loss of life. However, both hurricanes have had economic impacts, some of which will probably spread throughout the economy. Those impacts arise from the disruption of production (especially of oil, oil products, and natural gas), from spending in the affected areas, and from the loss of wealth of those most directly affected.

However, even with the additional impacts of Hurricane Rita, the macroeconomic consequences of the hurricanes appear more modest than those that CBO estimated for Hurricane Katrina in its letter to Senator Frist on September 6, 2005. According to CBO's estimates, while gross domestic product (GDP) will grow about half a percentage point more slowly over the second half of 2005 as a result of the hurricanes, most of that slowing will occur in the third quarter. CBO anticipates that, with private and government support for recovery and rebuilding, GDP growth will not be much affected in the fourth quarter of 2005 and could even be somewhat higher than was projected before the hurricanes. Overall, GDP will return to its previous trend by early 2006, CBO projects, and subsequently rise above that trend as rebuilding raises overall economic activity. Employment growth will roughly mirror the impacts on GDP. The pace at which consumer energy prices return to their pre-Katrina levels will be the dominant factor in determining the duration of higher inflation.

But those estimates are necessarily uncertain. CBO, like other forecasters, bases its analyses on available information about the losses in the stricken region and about the flow of resources to the region. New information on those matters, as well as about the damage to and recovery of energy resources, will emerge in coming weeks, and estimates of economic effects will change as that information becomes available.

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The disasters also will have a significant impact on the federal budget. Because the overall economic impacts will probably be offset and then reversed by the end of fiscal 2006, the budgetary effects will be largely the result of legislation. At this point, the scope of such legislation and its ultimate costs are yet to be determined. The President has already requested and the Congress has appropriated \$62.3 billion in emergency assistance, which will raise federal outlays by roughly \$30 billion in 2006 and by smaller amounts in subsequent fiscal years. Spending to pay flood insurance claims is expected to rise substantially in fiscal year 2006, and additional funding for that program is likely to be necessary. In addition, tax relief legislation enacted on September 23 is expected to reduce federal receipts by \$6 billion, almost entirely in fiscal years 2006 and 2007. Finally, there has been a wide variety of legislative initiatives, as well as some discussion of budgetary changes to offset—in whole or in part—any additional federal costs.

The details of CBO's economic and budgetary analysis are in the attachment. I hope that you find the analysis useful. As you requested in your letter, CBO will provide additional updates as more information becomes available. CBO would be pleased to address any further questions that you might have.

Sincerely,

A handwritten signature in dark ink, appearing to read "Douglas Holtz-Eakin". The signature is fluid and cursive, with a long horizontal stroke at the end.

Douglas Holtz-Eakin
Director

Attachment

Identical letter sent to the Honorable Judd Gregg

cc: Honorable John M. Spratt, Jr.

The Macroeconomic and Budgetary Effects of Hurricanes Katrina and Rita: An Update

September 29, 2005

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Summary

Hurricanes Katrina and Rita have temporarily reduced the growth of economic output, but the effects that rebuilding will have on economic activity may more than offset the drag by early next year. For the federal government, unless the Congress takes action to reduce other spending or raise taxes, the hurricanes will push the budget further in deficit for the next few years, largely because of the \$62 billion appropriated for emergency assistance, but also because of various temporary changes to tax rules and a slightly weaker economy during the second half of this year.

The majority of the economic and budgetary effects of the hurricanes can be attributed to Katrina. Initial indications are that Rita had a smaller effect on nonenergy infrastructure, although its impact on oil, natural gas, and electricity resources may be greater than that of Katrina. An assessment of Rita's damage to offshore platforms and pipelines is incomplete.

The major uncertainties affecting the speed of recovery are how quickly insurance and government payments are distributed; how quickly consumer energy prices decline; and how quickly rebuilding can start, in New Orleans and elsewhere. For example, if, during 2005, about half of the private insurance claims are paid out, federal spending for relief and recovery totals about \$10 billion (in transfers and outlays for goods and services), gasoline prices fall back to only about 10 percent higher than their pre-Katrina levels, and rebuilding is only slightly delayed relative to the timing experienced in previous hurricanes, then economic dislocation caused by the hurricanes probably will be offset by the reconstruction effort by early next year.

The direct, immediate reduction in employment in the areas affected by Hurricane Katrina now appears to be between 280,000 and 400,000 jobs. The effects of Hurricane Rita appear to have been considerably smaller. Much of those losses will be trimmed as some people return to their former jobs or find new jobs (including in reconstruction work) in the next few months. By early next year, the pace of reconstruction will probably cause the net effect of the hurricanes on jobs nationwide to be minimal. If, as appears likely, output bounces back to equal or exceed its previous trend by early next year, total employment will be similar to what it would have been if the hurricane had not occurred, even though some of the people who lost jobs may remain unemployed for some time.

The growth of consumer prices will be higher for the second half of this year than previously expected, primarily because of the increase in energy prices. But consumer price inflation should revert to pre-Katrina rates in the first half of 2006 if, as is generally expected, energy prices ease part of the way back to their pre-Katrina levels. Higher prices of construction materials and higher energy prices (which raise transportation costs) will tend to temporarily increase inflation in the prices for many non-energy-related goods as well as for airline, bus, and railroad fares.

Effects on Gross Domestic Product

The initial effects of the hurricanes on economic output comes from the lost production in the affected regions and the temporary spike in energy costs. However, looking forward, the impact of the hurricanes on the pace of production and income depends on what happens to four major categories of spending: investment (in business plant and equipment, commercial structures, and housing), spending on consumer durables, government spending for goods and services, and other household consumption expenditures (see Table 1).

The Congressional Budget Office (CBO) estimates that the hurricanes could reduce real (inflation-adjusted) growth of gross domestic product (GDP) in the third quarter of 2005 by between 1 and 1½ percentage points, but as the cleanup and repair begin, the economy is likely to grow in the fourth quarter at a rate not much different from what would have occurred without the hurricanes, and possibly even a little higher. GDP growth for the second half of 2005 is likely to be about ½ a percentage point lower than it would otherwise have been. The spending to repair or replace capital stock (homes, business structures, and equipment) is likely to drive the level of output back to its previous trend early in 2006 and to continue to add slightly to growth during the rest of the year.

Initial Production Losses in the Directly Affected Areas

Estimates of the initial production losses in the directly affected areas are necessarily very rough. CBO estimates the direct losses of marketable goods and services to be about \$28 billion to \$44 billion (at annual rates) in both the third and fourth quarters. Those estimates are for initial production losses and do not take into account the effects of higher energy prices on nationwide economic activity, increased government spending, or the impact of private rebuilding.

The vast majority—\$18 billion to \$28 billion in each quarter—of the losses in production comes from lost oil and gas production and from refinery damage. The loss in crude oil production is expected to be 0.35 million barrels per day (mmbd) in the third quarter and 0.50 mmbd in the fourth. For natural gas, output appears to be 0.25 trillion cubic feet (tcf) lower in the third quarter and 0.30 tcf lower in the fourth. Refinery output (primarily of gasoline) is expected to fall by 0.30 mmbd in the third quarter and 0.15 mmbd in the fourth quarter. (To gauge the value of lost output, CBO multiplied those physical losses for each category by estimates of what the prices of the products would have been in the absence of the hurricane.)

Other production (excluding housing services and agriculture) may have fallen by \$8 billion to \$12 billion in the third quarter of 2005 and may fall by a similar amount in the fourth quarter. (Those estimates exclude rebuilding activity.) CBO's estimates are based on the number of employees displaced by the hurricanes, on the productivity of workers in that area relative to the national

Table 1. Estimated Net Effect of Hurricanes Katrina and Rita on Real GDP
(Billions of 2005 dollars at annual rates)

	2005	2006		2007	
	2nd Half	1st Half	2nd Half	1st Half	2nd Half
Energy Production	-18 to -28	-8 to -10	-5 to -7	-5 to -7	-5 to -7
Housing Services	-1 to -2	-2 to -4	-1 to -3	0 to -2	0 to -2
Agricultural Production	-1 to -2	0	0	0	0
Replacement Investment	7 to 11	29 to 43	30 to 46	30 to 46	25 to 37
Government Spending on Goods and Services	6 to 10	12 to 18	14 to 20	10 to 16	7 to 11
Effect of Higher Energy Prices on Nonenergy Consumption	-6 to -10	-5 to -7	-2 to -5	-1 to -3	0 to -2
Other Consumption	-8 to -12	-2 to -4	-1 to -3	-1 to -3	0 to -2
Real GDP	-21 to -33	24 to 36	35 to 48	33 to 47	27 to 35

Source: Congressional Budget Office.

average (inferred from relative wage rates), and on national productivity estimates. (Estimated impacts on employment are discussed more fully below).

The consumption of housing services in the region may have fallen by at most a few billion dollars. The hurricanes made uninhabitable about 0.2 percent of the nation's housing stock (owner-occupied, rental, and hotel units). Nationally, the housing stock provides housing services that the Bureau of Economic Analysis estimates were worth about \$1,275 billion (at an annual rate) in the second quarter of 2005. On that basis, the loss of housing services from the hurricanes could be about \$3 billion in the fourth quarter of 2005. Only one month of the third quarter—September—is affected, so the production loss in that quarter would be correspondingly smaller. Some of the apparent losses may be offset, as evidenced by the fact that the hotels and motels in Louisiana, Texas, and Mississippi that are still operating have extremely high occupancy rates and the vacancy rates of rental units are lower than they otherwise would have been.

Agricultural losses, according to the estimates of the U.S. Department of Agriculture, could amount to \$0.9 billion. That could subtract between \$1 billion to \$2 billion, at an annual rate, from production in the second half of 2005.

Expected Impacts on Production and Incomes

In the second half of 2005, the effect of the hurricanes on overall real GDP growth will probably be modestly negative, approximately $\frac{1}{2}$ percentage point at an annual rate, primarily because of the drop in production in the third quarter. By the fourth quarter, cleanup and repair efforts are likely to begin to spur economic activity. By the early part of 2006, the level of real GDP is likely to be at least as

high as it would have been without the hurricanes, and the growth of real GDP and incomes will be modestly boosted for a year or so thereafter.

The possibility that the hurricanes could boost GDP does not mean that they are not damaging. As a measure of economic activity, GDP does not record the losses of lives and assets.

CBO's analysis of likely effects on production and incomes is based on what may happen to investment (in business plant and equipment, commercial structures, and housing), to spending on consumer durables, to government spending for goods and services, and to other household consumption expenditures. The analysis does not include any dynamic feedback effects—that is, the tendency of increased spending in one area to increase incomes and thus spending everywhere. Such effects are likely to be small, particularly if the Federal Reserve Board does not alter its apparent plan to increase its target interest rates. (The Federal Reserve increased rates by 25 basis points on September 20, as had been expected before the hurricane.)

Replacement of Lost Plant, Equipment, Residences, and Consumer Durables

Estimates of damages remain quite uncertain because the damage has not been completely surveyed. However, some private insurance sources have made initial estimates. For example, figures from Risk Management Solutions suggest that total losses—insured and uninsured—approach \$140 billion.¹ (See Box 1, for a discussion of insurance payments.) Some portion of those losses will reflect business interruptions, rather than actual capital losses, so for purposes of illustration, CBO assumes a round number of \$100 billion in losses to fixed capital and consumer durables.

Under an assumption that the hurricanes damaged a representative sample of the national stocks of fixed capital and consumer durables, about 40 percent of the damage would have been in housing, a little over 30 percent in business plant and equipment, nearly 20 percent in public infrastructure (roads, bridges, sewer systems, and so forth), and 10 percent in consumer durables (vehicles, appliances, furniture, and so forth) (see Table 2). As time goes on, it may be possible to base estimates on the actual amount of damage experienced in the stricken areas, but for the time being, such estimates are not available.

CBO's analysis suggests that the pace of rebuilding and replacement of lost plant, equipment, housing, and consumer durables (that is, total private replacement and rebuilding) could rise quite rapidly, to an annual rate of between \$29 billion and \$43 billion (in 2005 dollars) by the first half of 2006. By far, the majority of such spending—perhaps three-fourths of the total—will be in residential construction.

1. See www.rms.com.

Table 2. Stocks of Fixed Capital in the United States, End of 2004

	Billions of dollars	Percentage of fixed assets and consumer durables	Percentage of private fixed assets
Fixed Assets and Consumer Durables	37,610	100.0	
Fixed assets	34,032	90.5	
Private	27,043	71.9	100.0
Nonresidential	12,569	33.4	46.5
Equipment and software	4,616	12.3	17.1
Structures	7,953	21.1	29.4
Residential	14,473	38.5	53.5
Government	6,990	18.6	
Consumer durable goods	3,578	9.5	

Sources: Congressional Budget Office; U.S. Department of Commerce, Bureau of Economic Analysis.

Government Spending

Various levels of government are spending large amounts for rescue and recovery. The federal government may have outlays of about \$2 billion more in September than it otherwise would have had and perhaps \$10 billion more in the fourth quarter. Spending for the next few years will also be higher as a result of the emergency appropriations and, possibly, additional funding yet to come. Some of the federal spending to date (to provide supplies and medical care, cover expenditures for the National Guard, repair levees and pumping stations, pump out New Orleans, and purchase mobile and manufactured homes, among other things) is for goods and services, but some consists of transfers to individuals and grants to state and local governments.

State and local government spending will also be higher during the fourth quarter of 2005 and in 2006 as infrastructure is rebuilt. Experience with previous disasters does not provide clear guidance as to how large the increase will be, but it may be on the order of a few billion dollars in the fourth quarter.

Consumer Spending

The hurricanes have reduced the consumption expenditures of people in the directly affected areas and for the nation as a whole through the effect of higher energy prices.

Consumption of Nondurables by Affected Residents. People who lost houses, businesses, or jobs in the hurricanes will probably, even with insurance and government assistance, face a loss of wealth that will reduce their consumption spending. In addition, at least in the short term, many residents in the stricken areas may find themselves short of cash and, without access to documentation,

Box 1. Insurance Payments Associated with Hurricanes Katrina and Rita

According to Standard and Poor's, privately insured losses from Hurricane Katrina could range from \$35 billion to \$60 billion. Hurricane Rita, according to Risk Management Solutions, resulted in privately insured losses of \$4 billion to \$7 billion. By comparison, insurers paid about \$32.5 billion after the September 11, 2001, attacks and just under \$23 billion after last year's four hurricanes. Developing credible loss estimates for Hurricanes Katrina and Rita is difficult because of the nature of the losses. In general, private insurers are responsible only for wind losses, not losses caused by flooding, so disputes over settlements are likely. And insurers' access to the properties has been delayed by the flooding. Moreover, the extent of business interruption losses, which could be substantial, depends on the duration of the interruption, which is not yet known. (Business interruption losses were about \$11 billion, or one-third of the insured losses after 9/11.) Finally, liability claims are possible from environmental damage.

Some insurance claims have already been settled, and many policyholders have received payments for temporary housing assistance. There were about 2 million claims (\$22.9 billion) after last year's hurricanes, and over 95 percent were settled within 4½ months, according to industry sources. More claims are expected from Katrina and Rita, and the settlements are likely to be much higher. Disputes over the source of the, however, could delay settlements of claims, especially if those disagreements end up in the courts. The Mississippi Attorney General filed suit on September 15 to force insurers to cover flood losses where the policyholders did not have federal flood insurance. Reinsurers might dispute obligations to primary insurers on any flood-related claims should that suit be successful. The suit could have the unintended effect of restricting the supply of private insurance in Mississippi in the future and thereby slow the pace and extent of rebuilding.

Although no estimates have been published, federal flood insurance payments are also likely to be substantial. Although a significant percentage of affected households did not have flood insurance, the National Flood Insurance Program (NFIP) has received 150,000 claims arising from Katrina to date, and NFIP has tried to speed up payments through the use of aerial photos.

unable to borrow. Under those circumstances, their consumption may drop until they can get either jobs or assistance from the government or charities.

Insurance payments may be an important offset to losses of wealth, though some may be delayed by disputes over the source of the loss (as described in Box 1).

Effects of Higher Energy Prices on Nonenergy Consumption. Consumer purchases of nonenergy items nationwide will also be affected by the increases in energy prices. Such increases redistribute income from consumers to stockholders of companies producing and refining energy, some of whom are also U.S. consumers and some of whom are foreigners. If all of those parties spent about the same portion of their income on U.S.-produced nonenergy goods and services as do other consumers, there would be no net effect on nonenergy consumption. However, foreigners are likely to spend less than U.S. residents on U.S. goods, and some of those consumers facing higher energy prices may have difficulty maintaining their consumption of other goods and services as they pay more for energy. Thus, CBO assumes that about 40 percent of consumers will have to cut back on nonenergy purchases.

Employment Effects

Between 280,000 and 400,000 people lost jobs directly because of Hurricane Katrina. The effects of Hurricane Rita appear to have been considerably smaller, although the data are not complete. The impacts of the hurricanes on general economic activity mean that employment will be temporarily depressed—on average as well as in the stricken areas. However, the rebuilding efforts appear likely to fully offset all of the reduction in employment in the first half of 2006.

Measuring the effects of the hurricanes on employment will remain difficult, even after the Bureau of Labor Statistics begins to publish data for September. (Those data will be published on October 7 for the national level and on October 21 for the state level). The bureau will probably experience unusual difficulty in measuring employment in the storm-damaged areas (see Box 2).

Direct Effects of Katrina

Two primary sources of information are available to estimate the possible impacts of the hurricanes on employment. A lower bound can be estimated from the number of storm-related claims for unemployment insurance filed to date. The Labor Department estimates that a total of 279,000 such claims had been filed by September 24. The number could go higher. (One potential source of future claims is workers who have so far remained on the payroll even if they cannot work but who will be dropped at some point.)

The other source of information is the Bureau of Labor Statistics' report of annual average data for 2004, based on the Quarterly Census of Employment and Wages. That report includes the number of establishments, total employment, and total wages in areas affected by Katrina.² The figures define the jobs potentially at risk because of flooding and other damage caused by Katrina and as such represent an upper bound of the storm's effect. At the broadest level, the Federal Emergency Management Agency (FEMA), as of September 8, had designated 169 counties or parishes in four states as eligible for some form of disaster assistance; employment in those areas totaled about 5.8 million jobs, or 4.5 percent of the U.S. total. Residents of those counties might have missed at least one day of work. In the 86 counties or parishes classified as "most affected" (meaning that residents are eligible for both individual and public disaster assistance), where people could have missed a week or more of work, employment was 2.4 million jobs (or 1.9 percent of the national total). The wage bill in those counties was \$76.7 billion, or 1.5 percent of the national total.

Workers in the areas that FEMA has identified as flooded and storm-damaged are those most likely to experience an extended absence from work (or even to lose their jobs permanently). According to the Bureau of Labor Statistics, in the fourth quarter of 2004 there were about 22,500 business establishments within those areas employing roughly 373,000 workers and paying \$3.49 billion in wages and salaries during the quarter (not annualized) (see Table 3). Most of the at-risk employment was in flooded areas of Louisiana, while in Mississippi, virtually all of the potential employment losses were attributable to damage rather than flooding. In addition, about 265,000 workers were employed within half a mile of the storm-damaged areas in Louisiana and Mississippi—184,000 of them in Louisiana.

Direct Effects of Rita

Hurricane Rita's impacts on employment appear to have been considerably smaller than those of Katrina. While detailed data on areas damaged by Rita are not yet available, data from the Quarterly Census of Employment and Wages indicate that in the 17 counties or parishes designated as eligible for individual disaster assistance, total employment in 2004 stood at about 482,000 jobs, or 0.37 percent of the U.S. total. The wage bill in those areas was \$15.7 billion, or 0.3 percent of the U.S. total.

As in the case of Katrina, actual employment losses are likely to be considerably smaller than the number of jobs potentially at risk. The timing of the storm was such that the September survey was already completed before the hurricane

2. Those data are derived from reports submitted by all employers who are subject to unemployment insurance, accounting for more than 98 percent of total wage and salary employment. The Quarterly Census of Employment and Wages is sometimes referred to as the ES-202 program.

Box 2. Employment Measurement Issues

The Bureau of Labor Statistics recognizes that it faces unusual challenges in collecting employment data in the areas damaged by Katrina. As a consequence, some procedures will be modified. In particular, at the establishment level, nonrespondents in the most heavily affected areas will be assumed to have an employment level of zero, instead of the usual assumption made for nonrespondents that over-the-month changes were the same as at those of establishments with similar characteristics. That modification runs the risk of overstating employment losses attributable to Katrina, but the normal procedure would carry a strong risk of understating such losses. For the many multiestablishment firms that report all of their data from a single central site, it should be possible to obtain accurate data on workplaces within the disaster areas. The bureau does not intend to quantify the direct effect of Hurricane Katrina, “because its effects can not be separated from other influences on the economy, particularly at the national level.”

Evacuees staying in shelters, hotels, and motels were not interviewed for the September survey of households, and there was no attempt to contact sample households in Orleans and Jefferson parishes. However, outside those parishes, people in sample households who had evacuated but returned to their homes by the week of September 19 were interviewed as usual.

Hurricane Rita probably will not affect the data for September and is likely to pose, at most, minor difficulties for the collection of establishment-level data. However, the collection of household data in Southwest Louisiana and Southeast Texas (including the Houston metropolitan area) might have been hampered by the evacuation for Rita.

struck, so no measured effect will be present in the data for September. If most residents are able to return home and cleanup can begin once floodwaters have receded and power and other basic services are restored, then the impact on measured employment in October should be small. The evacuation of more than 2 million residents from the Houston metropolitan area (most of whom did not reside in counties eligible for individual disaster assistance) probably resulted in a loss of a few days’ pay for some workers and reduced profits for employers who continued to pay their workers, but will not show up in the October employment data. Renewed flooding in portions of New Orleans and St. Bernard Parish might slightly delay the recovery from job losses attributable to Katrina, though it should have no impact on employment totals by the end of the year.

Table 3. Employment and Wages Within Areas Damaged by Hurricane Katrina, Fourth Quarter of 2004

	Alabama	Louisiana	Mississippi	Total
Employment (Thousands of jobs)				
Flooded Area	*	305	1	306
Nonflooded Area by Degree of Damage ^a				
Limited	2	8	11	20
Moderate	*	2	6	9
Extensive	0	1	2	3
Catastrophic	<u>0</u>	*	<u>35</u>	<u>36</u>
Total	2	316	55	373
Wages (Millions of dollars, quarterly rate)				
Flooded Area	1	2,966	5	2,972
Nonflooded Area by Degree of Damage ^a				
Limited	16	60	111	187
Moderate	3	13	42	57
Extensive	0	4	15	18
Catastrophic	<u>0</u>	<u>5</u>	<u>248</u>	<u>252</u>
Total	20	3,047	419	3,486

Sources: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics; Department of Homeland Security, Federal Emergency Management Agency.

Notes: Zones that were both flooded and storm-damaged were classified as “flooded areas.”

* = Fewer than 500,000.

a.. Based on FEMA’s storm-damage categories.

Employment Pattern Through Early 2006

The pattern of employment effects for the nation will tend to track the pattern for GDP discussed above. The net effect of the negative macroeconomic effects and the positive rebuilding effects will probably result in a higher level of employment by the second quarter of 2006 than would have occurred in the absence of the hurricanes. By the end of this year, the net employment loss may be less than 200,000 jobs, and by the second quarter of next year, net employment may be higher. Of course, many of the people who lost jobs because of Katrina may be unemployed for many months.

Inflation

The effect of the hurricanes on inflation depends almost entirely on the path of energy prices. (A detailed discussion of factors affecting energy prices begins on page 19.) Shortages of some other commodities and increased demand for workers and materials for rebuilding will have a relatively small effect on inflation.

Gasoline prices, as compiled by the Department of Energy's Energy Information Administration (EIA), jumped sharply in late August and the initial weeks of September because of the reduction in refinery operations, but forecasts of gasoline prices remain significantly higher through mid-2006 (see Figure 1). The longer-run effect on prices stems from the prospect of reduced refinery capacity for many months and from the continued pressure of high world oil demand on crude oil prices.

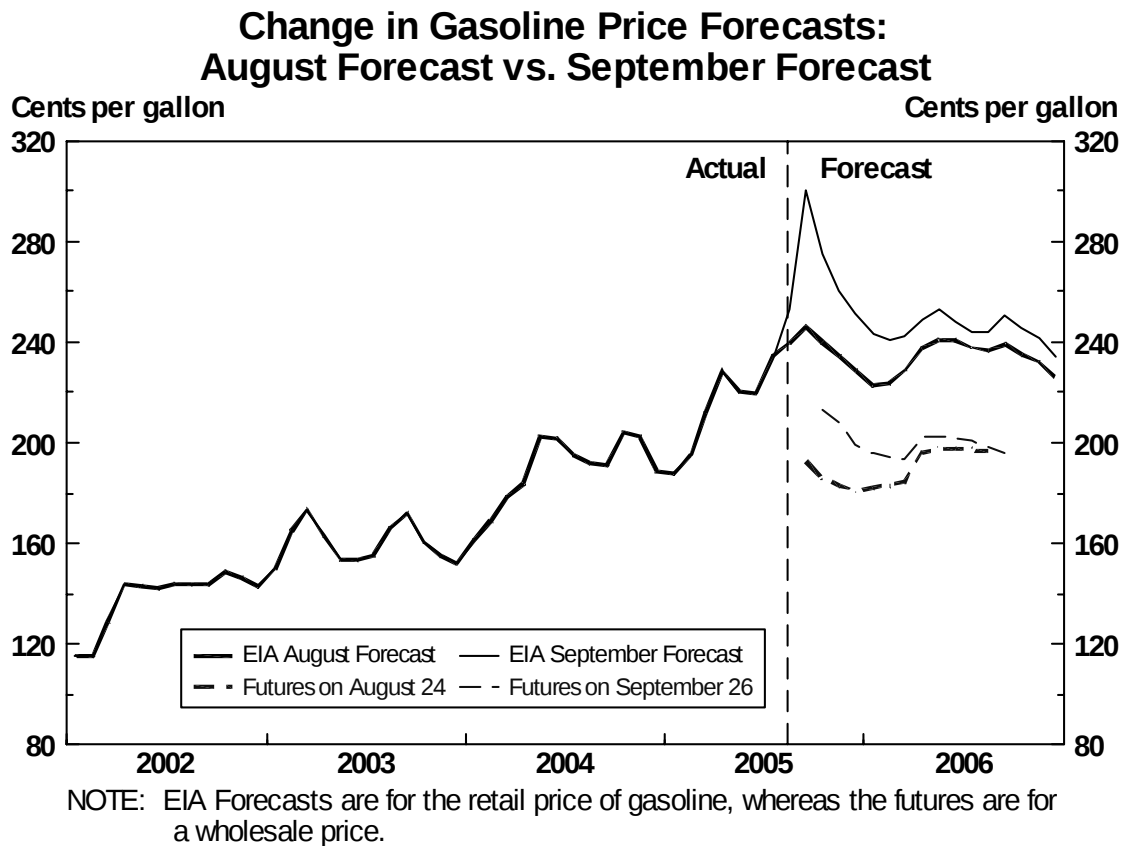
Natural gas prices have also jumped in commodity markets. Although natural gas prices for homeowners will not rise as much in percentage terms, they may still be almost 40 percent higher this winter than last (see Figure 2). The persistence of the effect of the hurricanes on natural gas prices may be even greater than that for gasoline. Utilities' demand for natural gas is expected to remain high even though prices are high.

Electricity prices for residential consumers will ultimately increase as a result of the hurricanes, although not immediately because of the regulation of electricity prices for those users. In the future, higher natural gas prices and the cost of rebuilding capital stock damaged by the storms will lead to higher electricity prices.

Retail food prices are expected to be slightly higher because of increased transportation costs, even though the outlook for farm prices is slightly lower. Farm prices are lower in part because of hurricane-related transportation delays, but primarily because agricultural production estimates for most crops increased recently for reasons unrelated to the hurricanes.

The direct short-term effects of the hurricanes on the rise in the consumer price index for all urban consumers (CPI-U) stemming from the increase in energy prices will be large. From those direct effects alone, the growth of the CPI-U between the fourth quarter of 2004 and the fourth quarter of 2005 may be almost 1 percentage point higher than would have occurred in the absence of the hurricanes. During 2006, however, CPI-U inflation may be slightly lower than previously anticipated, as the effect of the hurricanes on energy prices dissipates.

Figure 1.



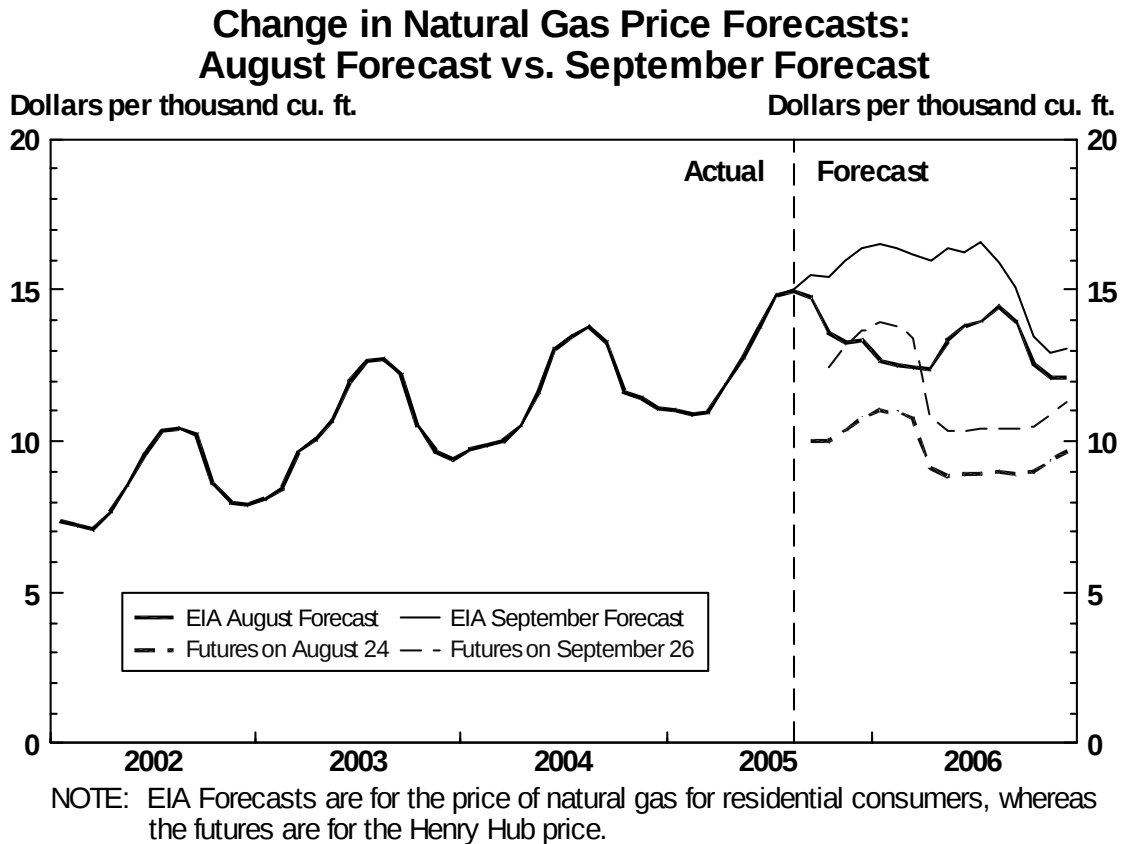
Effect on the Federal Budget

It is still unclear what the ultimate impact of Hurricanes Katrina and Rita will be on the federal budget. Much will depend on policy decisions yet to be made as to the scope of the federal government's role.

Federal Spending

To date, the President has requested and the Congress has appropriated \$62.3 billion in emergency assistance in response to Katrina. Almost all of that amount—\$60 billion—was provided to the Federal Emergency Management Agency's disaster relief account; some of those funds could be used for Hurricane Rita or other disasters, if necessary. As of September 21, FEMA had obligated about \$12 billion of that appropriation, and allocated another \$4 billion for future obligation for activities related to Hurricane Katrina. Of that \$16 billion, \$6.3 billion has been allocated for housing assistance and the acquisition of manufactured housing, \$3.1 billion has been committed to states in the form of goods and services for relief activities, and \$3.5 billion will be used to reimburse billion has been allocated for housing assistance and the acquisition of

Figure 2.



manufactured housing, \$3.1 billion has been committed to states in the form of goods and services for relief activities, and \$3.5 billion will be used to reimburse other federal agencies—particularly the Army Corps of Engineers and the Defense Department (DoD)—for their disaster relief efforts. In addition, those agencies have received funding of their own—\$400 million for the Corps and \$1.9 billion for DoD (for costs associated with the deployment of military personnel in support of relief efforts, for the evacuation of military personnel and their families, and for short-term repairs to military facilities).

CBO anticipates that outlays from the supplemental appropriations will be about \$2 billion in September, about \$30 billion in fiscal year 2006, and the remainder over the following three years. Although billions of dollars may be obligated in this month (that is, within fiscal year 2005), most of the checks are likely to be written in subsequent months. Any substantial spending on reconstruction activities will occur over a period of several years.

In addition to supplemental appropriations for disaster relief, the Congress and the President have enacted a \$2 billion increase in borrowing authority for the flood

insurance program, bringing the total available borrowing authority to \$3.5 billion. CBO expects that payments for flood insurance claims resulting from the hurricanes will reach \$1 billion to \$2 billion in the first quarter of fiscal year 2006. Historically, FEMA has paid at least one-third of the total value of flood insurance claims within three months of an event, and 90 percent of those claims within one year. Given the magnitude of Hurricane Katrina, CBO expects that the initial rate of payments, within the first three months, will be slower. However, because FEMA is already implementing expedited procedures for paying claims in affected areas, the percentage of claims paid by the end of fiscal year 2006 will probably be in line with historical experience. CBO estimates that additional outlays in 2006 from currently available authority will total between \$3 billion and \$4 billion.

Although CBO does not have sufficient information at this time to estimate the total value of claims that FEMA is likely to face because of the recent hurricanes, information from the agency about the amount of flood insurance in force in the affected areas suggests that those losses will significantly exceed the \$3.5 billion that CBO estimates is currently available to pay such claims.

The Congress and the President also enacted the TANF Emergency Response and Recovery Act of 2005 (Public Law 109-68), which provides additional funds to states that were damaged by Hurricane Katrina or those that are hosting evacuees from the hurricane to provide benefits to needy people. That legislation will cost about \$400 million, CBO estimates, mostly in 2006.

Some federal programs may experience temporary increases in spending as evacuees become eligible for benefits (such as Medicaid) that they would not normally collect. Also, workers who are now unemployed as a result of the hurricanes may receive unemployment benefits, which CBO estimates could cost about \$600 million (in addition to disaster unemployment assistance, which is paid by FEMA). The government is likely to lose at least a few hundred million dollars in royalty payments for oil and gas leases on the Outer Continental Shelf; on the other hand, the government will receive about \$700 million from the sale of 11 million barrels of oil from the Strategic Petroleum Reserve.

Legislation passed or under consideration in the House or Senate would, if enacted, further add to the federal deficit. For example, the Senate has added \$4.3 billion to the Commerce-Justice-Science appropriation bill, mostly for emergency housing assistance. CBO estimates that \$2.5 billion of that sum would be spent in 2006.

Federal Revenues

The hurricanes will affect total federal receipts through their impact on the overall economy and through delays in the payments of taxes and other tax relief. The

temporary reduction in economic growth will reduce receipts but not significantly. A reduction in overall economic growth of 0.5 percentage point for a full year might reduce receipts by between \$5 billion and \$10 billion, or less than a billion dollars per month on average. But the effect of the hurricane in reducing economic growth is expected to be of much shorter duration, and the changes in receipts are not likely to stand out from total federal receipts that average about \$175 billion per month. As the economy picks up with recovery and reconstruction, the negative effect on overall receipts should dissipate.

Delays in the payment of taxes could affect the timing of several billion dollars or more in receipts over coming months. As a result of Internal Revenue Service rules implemented shortly after Hurricane Katrina struck and recent legislation, hurricane victims may delay all tax payments until February 28, 2006. Taxpayers with records in the disaster areas and relief workers can also qualify. As result, some payments of taxes, including estimated payments of corporate and individual income taxes and withheld income and employment taxes, may be delayed for a number of months. Some of that delay would shift receipts out of fiscal year 2005 and into 2006, but probably not more than a few billion dollars.

In addition, the Katrina Emergency Tax Relief Act of 2005, which was enacted on September 23, provides tax relief in a number of ways to businesses and individuals. The Joint Committee on Taxation estimates that the act will reduce revenues by about \$6 billion, almost entirely over fiscal years 2006 and 2007. The provisions with the largest revenue effects allow taxpayers to deduct more personal property losses from taxable income, allow taxpayers more time to replace damaged property without being assessed income taxes on the insurance proceeds, and allow businesses and individuals to deduct more charitable donations from taxable income.

Effects of the Hurricanes on State Budgets

Data from the state of Louisiana are especially difficult to acquire, but that state is expected to face severe revenue problems. Early information from Mississippi, Alabama, and Texas indicates that state general fund revenues may not suffer significantly as a result of Hurricanes Katrina and Rita. Expenditures are expected to increase significantly in all four of those states, whether from influxes of evacuees in Texas, or from cleanup and rebuilding efforts in Louisiana, Mississippi, and Alabama. Some local governments may confront more difficulties, as they face significant losses in their property tax bases.

Louisiana

State officials are still in the process of gathering information about the effects on the state budget. Unofficial estimates of lost revenues have ranged from \$3 billion to \$6 billion. The governor's budget recommendation for assumed state tax

collections for state fiscal years 2005 and 2006 is about \$12 billion, excluding federal funds of over \$6 billion. Business closures, disruptions in corporate tax filings, and the mass departure of tens of thousands of residents will disrupt both income and sales tax collections. According to the Government Performance Project, the state relies on sales taxes for almost 60 percent of its total tax collections and income taxes make up about 28 percent. About \$2 billion in state sales tax collections comes from the affected areas.

Local governments, particularly New Orleans', are in a more precarious position as they have lost significant parts of their tax bases—notably revenues from property taxes. About two-thirds of the population of Louisiana is from an area officially declared a disaster area. Property taxes in the affected counties total about \$1.3 billion, and local sales taxes about \$1.8 billion. The affected local governments have about \$9 billion in outstanding debt.

Mississippi

In testimony before the state economist's office on September 12, the Deputy State Economist said that the revenue picture would be mixed but that over time, the net effect on the state's general fund would probably end up being negligible. While about two-thirds of the Mississippi population lived in an area officially declared a disaster area, initial tax losses resulting from lost income and wages and some decreased gaming activities will be balanced by increased collections from income taxes as cleanup continues and rebuilding efforts begin.

About one-third of the state's gaming facilities have been affected by Hurricane Katrina, but revenues from gaming support only a small portion of the state's overall general fund—about 5 percent. A little less than half of those revenues comes from the coastal counties most affected by the hurricane.

The state is trying to assess the potential damage to state facilities and any increased demands on state programs. Much of the ultimate effect on the state budget will also depend on how much of the spending is eligible for federal reimbursement.

It is likely that local governments in areas affected by the hurricane were generating between \$250 million and \$300 million from local sales taxes. With respect to the property tax, the affected areas generate about \$2 billion in property taxes, or a little more than two-thirds of the state total, and have about \$4 billion in outstanding debt.

Alabama

Although Alabama's gulf coast was hit by Katrina, the state is not anticipating any long-term effect on revenues. The 10 affected counties in Alabama hold about 18 percent of the state population.

The primary effect on state revenues will be any reduction in income taxes as a result of lost wages. At this time, state officials are not anticipating a significant change in sales tax revenues. The state is granting a waiver in the six counties most affected by the hurricane for income tax remittances; individuals and corporations will be able to delay paying income taxes until January 1. Early estimates indicate that the state's cash flow will be sufficiently strong to absorb the effects of that delay.

Local governments in areas affected by the hurricane generate about \$243 million in property taxes and \$267 million in sales taxes. The affected local governments have about \$2 billion in outstanding debt.

Texas

Texas has received a majority of the evacuees from Katrina—more than 140,000 displaced heads of household are registered in Texas with the U.S. government. The state estimates that 373,000 evacuees are temporarily calling Texas home. The state also sustained substantial damage, particularly in rural areas, from Hurricane Rita.

While the governor's office has stated that it is too soon to estimate the total costs of the storms to the state and local agencies, the costs from various agencies are considerable. The Texas Education Commissioner estimated that the state's bill to assist displaced students could be at least \$450 million. The city of Austin, which is housing over 4,000 evacuees, estimated costs at \$2.7 million in less than two weeks. The city may receive federal reimbursement for some of those costs.

FEMA has said that it will reimburse school districts for transportation costs, portable buildings, school computers, and mental health counselors, but not for other costs related to hiring new teachers and support staff.

Effects on Municipal Bonds

Overall Picture

All three major ratings firms have issued warnings on debt issued by cities, special purpose districts, and states along the Gulf Coast, but they had not downgraded any bonds as of September 23. Because of the hurricanes, between \$10 billion and \$15 billion in outstanding debt in Alabama, Louisiana, and Mississippi is at a greater risk of default. Also, local governments and quasi-governmental entities are facing significant risks of default. In general, most analysts believe that the hurricanes have increased the chances of short-term losses but that long-term stability will return to the market because many of those losses will be covered by insurance and because the federal government will provide significant aid for cleanup costs.

Local and Quasi-Governmental Issues

Both Louisiana and Mississippi have relatively good liquidity and the ability to borrow from various funds in order to meet bond obligations. In contrast, local governments face lost property and sales taxes and will probably not be able to generate other revenue streams to pay off bonds. Although they can probably pay what is owed through the end of the year, local governments will have limited options to raise revenues after that. Some issuers were not able to make September interest payments, and some analysts believe that bankruptcy for New Orleans and other cities is a possibility. MorganStanley suggests that health care facilities and certain structured public finance transactions like those for stadiums and transit projects are at the most risk for default.

Louisiana and Mississippi are working to help local entities pay interest on bonds. In Mississippi, the state has established a \$100 million fund from which local governments can borrow and pay off the loans with tax revenues or funds from FEMA whenever they are received.

New Orleans has about \$800 million of outstanding bonds, the water and sewer authority another \$198 million, the convention center has about \$500 million in bonds that are dependent on hotel and restaurant taxes, and the airport has about \$140 million in outstanding general airport bonds.

A study by Standard & Poor's suggests that bond insurers with the heaviest exposure in the Gulf Coast region will be able to withstand "worst case" scenarios, remaining liquid even if required make payments on numerous defaults. Moody's is somewhat less optimistic, suggesting that a worst-case scenario would put capital ratios for certain firms at a precarious level, and might generate a downgrade in ratings for bond insurers.

Sectoral Economic Effects

Energy Supply and Prices

Supply has been lost in the markets for crude oil, petroleum products (especially gasoline), natural gas, and electricity. Supply that was returning to the market after Hurricane Katrina was further disrupted by Hurricane Rita. The prices of gasoline and natural gas immediately jumped following the disruption of refinery and pipeline activities. Crude oil prices were not greatly affected by the loss of offshore oil production because refinery demand for oil was curtailed and because sales from the U.S. Strategic Petroleum Reserve and by the International Energy Agency had been announced. With offshore production initially returning faster than refineries were restarting, crude oil prices actually fell from their pre-Katrina levels—although renewed increases in crude oil prices are likely if the recovery of offshore production is delayed. Gasoline prices started falling after Katrina, too,

with the reopening of major product pipelines and increasing refining activity but remain above pre-Katrina levels. Natural gas prices, however, remain high and are likely to stay that way for some time.

The higher prices attributable to the two storms will linger for some months, until the damages to offshore oil and gas platforms and pipelines and to petroleum refineries, natural gas plants, onshore storage terminals, and transportation infrastructure for oil and gas can be repaired. Upward pressure on electricity rates is likely in the future as utilities try to pass through their increased costs for natural gas and as they press state regulatory agencies to allow them to recover costs for repairing damaged equipment and recover revenues from lost sales.

Crude Oil. Hurricane Katrina resulted in an immediate loss of nearly 1.5 million barrels a day of crude oil from the Gulf (100 percent of Gulf production, and 10 percent of the nation's oil needs), but the loss fell to about 0.9 mmbd before the facility closures in advance of Hurricane Rita halted all production again. About 700 manned platforms for producing oil and gas currently were closed as of September 28.

The full restoration of oil production will depend on the extent of damages to production platforms and undersea pipelines, and the damage assessment is far from complete. (About 0.2 mmbd are still offline because of damage to pipelines that Hurricane Ivan caused a year ago.) After Katrina, the Minerals Management Service reported extensive damage to 20 offshore production facilities and the destruction of 46 low-producing structures. The damaged structures include some of the highly productive deepwater platforms, which may not fully recover for many months. Hurricane Rita may have delayed the work in assessing the damage from Hurricane Katrina as well as inflicted additional damage. The extent of further damage is unknown, but it is likely to be extensive, given the intensity and path of the second storm.

One main factor has so far prevented the production losses from pushing up crude oil prices: refinery shutdowns have reduced the local demand for crude oil. Other potential influences on oil prices that have been reported are the announced sales of strategic oil reserves and the announced increase in OPEC's (the Organization of the Petroleum Exporting Countries') production quotas. Those factors are not likely to have a major impact on the price of crude oil, however.

Gasoline. The loss of gasoline supply was a problem almost exclusively for the Southeast and the East Coast initially as a result of the closure of two major product pipelines, but they soon reopened. Refinery closures attributable to Katrina continue to reduce the nationwide supply of gasoline and other refined products by about 5 percent (about 0.9 million barrels per day). In addition, a significant amount of refinery capacity currently is shut down because of

Hurricane Rita. Altogether, 20 percent of capacity is shut down, and it is uncertain how soon those plants will reopen.

In the first week after Katrina, the price of gasoline increased by 60 cents a gallon in the East (or by 25 percent), to nearly \$3.20 a gallon (for regular grade). Gasoline prices also increased sharply elsewhere—nationwide, prices averaged about \$3.05 a gallon. Outside the East, the price increase largely reflected a five-dollar-a-barrel jump in crude oil prices that occurred in August before the hurricanes and by the normal Labor Day peak in gasoline demand: it does not appear to have been caused by the hurricanes.

The initial loss of gasoline supply to the East was about 30 percent (reflecting a cutoff in the flow of both Texas and Louisiana gasoline) and to the nation, about 10 percent. With the recovery of the product pipelines within a week and with the benefit of a significant inventory drawdown in the East, the total supply to that region after the first week was down by only about 10 percent. Despite the closure of additional refineries with Rita (reflecting 3.5 mmbd in refining capacity), the market has not reacted further. In the week before and the week after Hurricane Rita, nationwide gasoline prices averaged about \$2.80 a gallon. However, because capacity will be lower for many months, gasoline prices are likely to be higher during the first half of 2006 than they would have been in the absence of the storms.

Natural Gas. Natural gas supply was affected by the loss of production from the Gulf of Mexico, damage to natural gas plants (which remove certain liquids from the gas so that it can go into pipelines for commercial use), and damage to pipelines. For the most part, the pipeline outages were related to electricity supply problems and to the slowness of the damage assessment work. Damage assessment also depends on the pace of the restoration of natural gas production. (Leaks cannot be found if pipelines are not operating at capacity.) The initial loss of nearly 10 billion cubic feet (bcf) a day from the Gulf, nearly 10 percent of the nation's supply, had been cut to about 3.5 bcf before Rita hit, but the volume that was shut in increased again with that storm. Currently, offshore gas production is about 7.8 bcf a day (or 80 percent of total capacity in the Gulf). Initial indications are that natural gas production will not come back as quickly following Rita as it did following Katrina.

Wholesale prices for natural gas increased from about \$9 per thousand cubic feet (mcf) to a high of about \$12 per mcf just after Katrina. Unlike gasoline prices, natural gas prices did not come back down as additional supply came online, and with the new loss from Rita, they currently are close to \$13 per mcf (having peaked at over \$14). Natural gas prices may well stay at those record highs through the winter. If the supply remains seriously disrupted, prices could go up even more. Damage assessment for the offshore regions has barely started.

Sustained high prices are related to the inelasticity of demand for natural gas by electric utilities in the face of the large supply disruption. Reportedly, utilities throughout the South have experienced difficulty getting natural gas. Operators of the Henry Hub (that routes Texas and Louisiana natural gas into the major interstate pipelines) are rationing their supplies. Further, late summer and early fall are normally a time to build inventories for the winter. That buildup now appears to be on schedule, although continued reduced production in the Gulf probably would lower it and contribute to continued high prices through the winter.

Electricity. After Hurricane Katrina, about 2.7 million customers were without electric power, state utilities in the Gulf had restored power to all but about 250,000, but with the further damages from Hurricane Rita, the outages increased again. Three days after Rita, customers without power in Texas, Louisiana, Mississippi, and Arkansas numbered about 1.3 million. Entergy, the main utility in Louisiana and east Texas, reports 279 transmission lines and 284 substations out of service—almost all of that damage is attributable to Rita. (The damage to 181 lines and 263 substations from Katrina had been largely repaired.)

Entergy had reported total losses for damages and lost sales related to Katrina of about \$1 billion. After Hurricane Rita, Entergy and the utilities operating in the affected areas of Texas, Louisiana, and Mississippi now report that they will need \$2.5 billion in assistance. Those costs have to be recouped through some combination of insurance, diminished returns to investors, and increased rates for local electricity consumers—subject to the approval of state public utility commissions. More broadly, rates for electricity in the coming months also will reflect a pass-through of increased costs for natural gas—a consequence of damage to offshore production and to pipeline infrastructure.

Transportation Sector

The hurricanes do not appear to have caused major disruptions to the transportation system of the United States—the only damage that appears likely to cause significant problems is that to the Port of New Orleans. Although some highways, rail lines, ports, and channels sustained severe damage and will operate at levels substantially below their prehurricane capacity for weeks or months, redundancies in the transportation system will enable most shipments to reach their destinations, albeit at somewhat higher costs and times in transit.

Roads and Bridges. In the immediate aftermath of Katrina, roads throughout southern Mississippi and the New Orleans area were impassable because of debris and downed power lines. Within a few days, however, most roads had been cleared enough to permit travel, although in some places, only two lanes of four-lane highways were available. Hurricane Rita flooded some roadways, but major arteries were not affected.

At this point, the national effects of road damage appear minimal, because most major roads reopened quickly and because alternative routes beyond the hurricane zone could accommodate rerouted traffic. Highways into and out of the ravaged areas of southern Mississippi and Louisiana have not been put to the test, however, because diminished economic activity in those areas has meant less demand for truck transportation (the major exception being the influx of emergency supplies).

Local and regional effects are greater. The I-10 Twin Spans Bridge across Lake Pontchartrain between New Orleans and Slidell needs its deck replaced. Louisiana highway officials expect to restore one lane in each direction by October 26, 2005, and two lanes in each direction by January 6, 2006. Because I-10 is the most direct route from the Port of New Orleans to points in the East and Northeast, the loss of it will increase trucking time and costs. But a work-around to the west and north is available. Once the port returns to normal, the cost and increased time associated with the diminished capacity of the I-10 bridge will probably be more pronounced. Numerous bridges on U.S. 90 and on state and local roads in southern Louisiana sustained serious damage. Many of those bridges provide access to port terminals and other commercial facilities as well as serve local traffic.

In Mississippi, two bridges on U.S. Route 90 (which parallels the east-west I-10) were destroyed: the Bay St. Louis Bridge and the bridge between Biloxi and Ocean Springs. In addition, the road was badly damaged in many places. The Mississippi Department of Transportation expects to have two lanes of traffic on U.S. 90 in Harrison County open for civilian traffic by mid-November.

Freight Railroads. Railroad lines in the New Orleans area and to the northeast suffered extensive damage, and a substantial amount of traffic that ordinarily would be interchanged between eastern and western railroads in New Orleans continues to be rerouted by way of Memphis or St. Louis. That adds as much as 48 hours to transit time. The most badly damaged track appears to be CSX's 100-mile line between New Orleans and Pascagoula, Mississippi. When it will be back in full service is not known. The consequences of that damage will be more apparent once port operations return to normal levels.

Ports. Several major ports along the lower Mississippi River in Louisiana and on the Gulf Coast sustained damage.

Of the Mississippi River ports—the Port of New Orleans, the Port of South Louisiana, and the Port of Greater Baton Rouge—New Orleans sustained the most serious damage but is slowly resuming business. It expects to be operating at about 30 percent to 40 percent of capacity within a month, at 80 percent of capacity within three months, and at 100 percent in four to five months. The first

cargo since Katrina hit was unloaded on September 13. As of that date, trucks were able to get in and out of the Port of New Orleans.

Those ports handle large amounts of bulk cargoes, such as crude and refined petroleum products, steel, aluminum ores, chemicals, rubber, machinery, plywood, coffee, cotton, foodstuffs, forest products, corn, oil seeds, and wheat. Ranked by tonnage, the Port of South Louisiana was first in 2003, New Orleans was fifth, and Baton Rouge was 10th. The Port of South Louisiana handles half of all U.S. exported grain and grain by-products, and its major test will come over the next few weeks as grain is harvested in the upper Midwest.

Each port has numerous terminals and extends many miles along the river. Many of the terminals concentrate on particular types of commodities for which they have specialized equipment. Some appear to have suffered greater damage than others, making the overall effects on commerce unclear. An underlying problem common to the Port of New Orleans and the Port of South Louisiana has been the lack of electricity and a lack of workers. Efforts are under way to restore power, and the Maritime Administration is working on getting ships in place that could house workers temporarily.

The Louisiana ports handle a smaller percentage of the nation's containerized cargo. Because the value of such cargo, which includes items like electronics, toys, clothes, and other household items, is generally much higher per ton than that of bulk commodities, the value of traffic handled at the Louisiana ports lags far behind that at the giant ports of Los Angeles, New York, and Long Beach.

Along the Gulf Coast in the state of Mississippi, the ports of Gulfport and Pascagoula sustained extensive damage. It is unknown when they will be able to resume normal operations. In the meantime, ships are being diverted to other ports. In 2004, Pascagoula ranked 35 and Gulfport ranked 37 in terms of the dollar value of foreign trade at U.S. ports, with each handling about \$4 billion of cargo.

In Louisiana, Port Fourchon, a key facility for crude oil transportation, has suffered major damage.

Waterway Navigation. The Mississippi River is now open to deep-draft navigation along its entire length, although a part of the southern end—roughly the portion encompassing the Port of New Orleans—is limited to daylight operation because some aids to navigation have not yet been replaced. The Coast Guard is advising vessels to operate at their minimum safe speed. Should the combination of slow orders and delays at terminals persist, barges will be unable to cycle up and down the Mississippi as quickly as usual, and shippers' costs could increase. Along various canals, sunken or damaged barges that might pose hazards to navigation are being identified and removed.

Drinking Water and Sewage Treatment

Hurricane Katrina caused significant disruption to drinking water and sewage treatment operations, and Hurricane Rita caused additional damage. Full restoration of drinking water systems and wastewater treatment systems will be delayed by the many breaks in the distribution and collection systems and by the need for upgrades and repairs in older systems. Uncertainties arising from the need to drain the floodwaters and from the scope and complexity of the interdependent systems make it difficult to estimate recovery times.

As of September 25, with the impacts of Hurricane Rita awaiting assessment, the Environmental Protection Agency (EPA) identified 158 drinking water systems and 40 publicly owned wastewater systems in Louisiana, Mississippi, and Alabama that were not operating or whose status was unknown. Those figures represent 7 percent of the drinking water systems and 16 percent of the publicly owned wastewater systems in the affected areas of those states. Systems considered operational may also need significant repair or restoration.

Estimates of the ultimate cost to restore drinking water and wastewater services are preliminary and vary widely. EPA does not yet have access to all of the affected systems and does not expect to have cost estimates for weeks.

Although water systems will continue to rely in part on the EPA-administered state revolving funds (SRFs) for clean water and for safe drinking water, FEMA grants will be the most immediate source of funds used to rebuild systems. The amounts currently available through the SRFs are small relative to the projected need. For example, allocations to the clean water SRFs of the three Gulf Coast states affected by Katrina totaled \$41.3 million in fiscal year 2005 and are tentatively set at \$28.6 million for fiscal year 2006. Those states' safe drinking water SRFs received a total of \$24.9 million in fiscal year 2005 and are tentatively allocated \$28.6 million for fiscal year 2006. FEMA's public assistance program grants typically constitute two-thirds of federal moneys flowing to disaster areas.³ The grants (authorized under the Stafford Act) are classified as for either emergency work (that which must be done immediately to save lives, protect property, public health and safety, or to lessen the threat of a major disaster) or permanent work (intended to restore damaged facilities to their predisaster design). Categories of permanent work, which may extend for 48 months, include water treatment and delivery systems and sewage collection and treatment facilities.

Other federal programs can also provide postdisaster assistance to water systems. The Department of Agriculture's Rural Utilities Service offers emergency and

3. The Congress appropriates funds for the program annually to the Disaster Relief Fund. Supplemental appropriations have also been made in response to specific disasters.

imminent community water assistance grants to respond to significant actual or imminent declines in the quality or quantity of drinking water where funds are needed to meet health or sanitary standards such as Safe Drinking Water Act and Clean Water Act requirements. EPA's Drinking Water Emergency Assistance program (authorized under the Safe Drinking Water Act) provides technical assistance and grants to respond to emergency situations in which public water systems, including their water sources, present a substantial danger to the public health as determined by the Administrator. Finally, under the National Response Plan administered by the Department of Homeland Security, the Army Corps of Engineers is responsible for FEMA's emergency support for public works and engineering. Such support includes emergency repair of wastewater facilities and temporary restoration of water supply systems. Funding is provided through mission assignments made by FEMA and paid for from the Disaster Relief Fund.

Bank and Other Loan Repayments

Default rates on business loans, as well as residential and commercial mortgages, are likely to increase, but insurance payments may keep the default rates low. In many cases, the value of the collateral backing the loans has been greatly diminished. However, the prospects for banks in the area might actually be improved by the increase in lending that will accompany rebuilding. Banks in Florida did well after the four hurricanes that struck last year. What is uncertain is whether that experience is a reliable guide because the nature of the losses is different.

Standard & Poor's expects the effect on residential mortgage-backed securities (RMBSs) to be "relatively limited." (The RMBS transactions do not include agency mortgage-backed securities; those transactions would largely be the "private-label" market.) The exposed pools have a limited concentration of mortgages in the affected areas. Fitch Ratings reached a similar conclusion after a review of two-thirds of its rated RMBS portfolio. Of the \$475 billion reviewed by Fitch, just \$3 billion (0.65 percent) are secured by properties in FEMA-designated disaster areas. Fitch believes that uncompensated losses on that exposure will not be substantial.

Most losses will probably be associated with the lack of flood insurance or insufficient flood insurance. Fitch's review found that the servicers of the mortgages were required to maintain flood insurance in special flood hazard areas, and to attest to that coverage in the servicer representations and warranties. However, some parts of New Orleans were not designated as special flood hazard areas. Initial indications are that between 25 percent and 40 percent of homeowners in New Orleans have flood insurance. Those without insurance will probably receive FEMA or SBA assistance in the form of cash grants or low-interest loans. In addition, some borrowers may face extended unemployment, and

others may choose not to return. Standard & Poor's expects that there will be an increase in delinquencies, given the damage to homes and the loss of employment.

In the past, hurricanes and flooding have not materially affected the trend of Freddie Mac's credit losses. Freddie Mac's exposure in the FEMA-designated disaster areas represents less than 1 percent of its total \$1.2 trillion credit guarantee portfolio, with just a quarter of that exposure in the three hardest hit parishes in the New Orleans area.

Agriculture Sector

Winds during Hurricane Katrina affected crops in portions of Alabama, Florida, Louisiana, Mississippi, and Tennessee. The affected counties account for 1 percent to 3 percent of total U.S. production of hogs, milk cows, cattle, corn, and soybeans. Those counties also account for around 15 percent of broilers, upland cotton, and rice and 85 percent of U.S. sugarcane.

Estimates of agricultural losses resulting from Katrina are still in flux, and estimates for Rita are not yet available. On September 20, 2005, the Agriculture Department estimated that losses due to Katrina amounted to \$700 million for crops and \$170 million for livestock. In addition, about 4.2 billion cubic feet of timber was damaged, and net losses will depend on the success of salvage operations. Katrina also caused significant damage to livestock production facilities. An estimated 6.2 million chickens died in the storm, and 2,400 poultry barns in the region were either lost or damaged. Loss of power to dairy operations and impassable roads have made it difficult to process and transport milk to market. Dairy losses are around \$3 million per week as long as power shortages continue. Those estimates could change as formal damage assessments are completed.

The agriculture sector will also be affected by higher prices for gasoline, diesel, and fertilizer. For each month that the cost of fuel remains 10 percent higher than it was before the storm, farmers incur additional production expenses of about \$85 million. The domestic nitrogen fertilizer cost index is currently 13 percent above what it was in August of last year.

Depending on the severity of the losses and the level of insurance coverage purchased, producers incurring crop losses from Katrina may be partially reimbursed through the federal crop insurance program. No estimates of insurance payments resulting from the storm are available at this time.

Although Katrina damaged port facilities, and a few facilities may take months to become fully operational, grain shipping is not expected to be a major problem. A current shortage of barges for Gulf transport and higher energy costs have increased the cost of moving grain, resulting in somewhat lower crop prices

upriver in the major grain belt areas. But port facilities are expected to be able to handle this year's grain harvest, which will be in full swing in a matter of weeks.

On September 21, the Agriculture Department announced administrative measures to alleviate stress on the grain economy caused by Katrina's damage to the Gulf transportation system. Those actions include providing financial incentives to move barges of damaged corn from New Orleans; arrange for alternative storage for grain; find alternative shipping routes to relieve pressure on the Gulf system; and allow producers to store government-owned corn on the farm with the option to purchase it.