

## Worker mobility before and after Hurricane Katrina

*A substantial number of workers were displaced from the New Orleans metropolitan statistical area after Hurricane Katrina; those who quickly found jobs in Texas experienced a substantial decline in their short-term earnings*

Richard L. Clayton  
James R. Spletzer

**H**urricane Katrina formed over the Bahamas on August 23, 2005, and crossed southern Florida on August 25<sup>th</sup> as a moderate category 1 hurricane. During the next several days, Hurricane Katrina strengthened rapidly in the Gulf of Mexico, attaining the status of a category 5 storm. On August 29, 2005, Hurricane Katrina recorded its second landfall as a category 3 storm in southeast Louisiana. Hurricane Katrina was the costliest and one of the deadliest hurricanes in the history of the United States. The storm caused devastation along the Gulf coasts of Alabama, Mississippi, and Louisiana, with catastrophic effects on the city of New Orleans. Levees separating Lake Pontchartrain from New Orleans were breached by the storm surge, ultimately flooding roughly 80 percent of the city and many areas of neighboring parishes.<sup>1</sup>

The States and the Bureau of Labor Statistics have done much to measure the labor market effects resulting from Hurricane Katrina. Many of these efforts are described in the other articles in this issue of *Monthly Labor Review*. This article studies the labor market effects of Hurricane Katrina using wage records from Louisiana and Texas, enhanced with data from the Quarterly Census of Employment and Wages (QCEW). Wage records are administrative data collected as part of the Federal and State Unemployment Insurance programs (UI), and are increasingly used by economists for research purposes. The analysis presented in this article shows that QCEW-enhanced wage records are a useful tool for studying the employment and earn-

ings impact from a large displacement event such as Hurricane Katrina.

A dynamic economy depends on a range of existing relationships, such as those between employers and employees (and their families), customers and suppliers, private and public institutions, and other community infrastructure. These relationships can take decades to establish and perhaps only days to destroy. In any economy, there is a constant level of change to these relationships; firms are born and some firms die, employees are hired and some are separated—some employees move to other jobs and some move to other locations. This creative-destruction process, along with a normal level of worker mobility, is healthy and positive.

However, New Orleans after Katrina is a changed economy. The tightly knit socio-economic fabric of relationships in the New Orleans area was severely damaged by the physical devastation to the New Orleans area and the resulting evacuation of large numbers of people. Statistics from the Census Bureau show that the population in Orleans Parish dropped from 437,186 on July 1, 2005 to 158,305 on January 1, 2006, and the population of the seven parishes that make up the New Orleans metropolitan statistical area (MSA) dropped by 29 percent, from 1,292,774 to 914,745, over the same timeframe.<sup>2</sup>

Natural disasters such as hurricanes, tornadoes, and floods usually involve rather temporary disruptions to the local economy. Typically, hurricanes affect immediate coastal areas and lose

Richard L. Clayton is chief of the Administrative Statistics and Labor Turnover Division. James R. Spletzer is a supervisory economist, and both are in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics.  
E-mail: Clayton.Rick@bls.gov and Spletzer.Jim@bls.gov

their force within a short time over land. Winds die down, flood waters recede, and evacuees return within days of the event to examine their households and businesses and begin the process of rebuilding. Many economic relationships are bent, and a few are broken.

Hurricane Katrina, however, was a truly unusual and abnormal event. New Orleans is a bowl-shaped flood area that is very densely populated. The New Orleans flooding from Hurricane Katrina and the re-flooding from Hurricane Rita roughly 4 weeks later resulted in severe damage to the housing stock and business structures, as well as severe damage to infrastructure and utilities (telephones, water, and electric power). This damage forced a long-term evacuation of a significant portion of the population and labor force.

The abnormal character of the Hurricane Katrina event makes for a compelling study of changing relationships. The lengthy evacuation forced many people to move far away from their homes and stay away, providing a strong incentive to find new employment in their new locations. This article studies the normal level of worker mobility between the New Orleans area and Texas, and contrasts this with the level of worker location change in the months immediately following Hurricane Katrina. The employment and earnings differences between normal mobility and the post-event mobility can be considered estimates of some of the labor market effects of Hurricane Katrina.

## Wage records

*Basic description of the wage records.* The Federal and State Unemployment Insurance programs provide benefits to eligible workers who are unemployed through no fault of their own and meet certain eligibility requirements. UI benefits are intended to provide temporary financial assistance to unemployed workers. When an individual applies for UI benefits, the State will review the person's eligibility and will calculate what the weekly UI benefits will be. In general, UI benefits are based on a percentage of an individual's earnings over a recent 52-week period. To calculate an individual's benefits, the State needs the individual's earnings history available in an electronic database. These earnings histories are supplied by employers in the State who are subject to State UI laws.<sup>3</sup>

Every quarter, employers subject to State UI laws are required to file two forms: the Quarterly Contributions Report and the Quarterly Wage Records. The contributions report lists the employer's monthly employment and quarterly wages in the State. It is filed jointly with the quarterly Multiple Worksite Report. Funded by BLS, the Multiple Worksite Report is designed to collect accurate employment and wage data at the local level. For employers with multiple establishments in the State, the Multiple Worksite Report disaggregates the employer's State-wide employment and wages into the employment and wages for each establishment in the State. After the Quarterly Contribution

Report and Multiple Worksite Report microdata are thoroughly reviewed and checked for errors by the State Labor Market Information staff every quarter, the States submit these data to BLS as part of the Federal-State cooperative Quarterly Census of Employment and Wages program. The data gathered in the QCEW program are comprehensive and accurate sources of employment and wages by county and industry, and provide a virtual census (98 percent) of employees on nonfarm payrolls. In the third quarter of 2005, the QCEW statistics show, in the U.S. economy, an employment level of 132.9 million, with 8.6 million establishments.

The quarterly wage records list the Social Security number and quarterly wages of all individuals who worked for the employer in the State during the quarter. The wage records are not edited by the State staff, unlike the Quarterly Contributions Report and the Multiple Wage Report data. The primary purpose of the wage records is to administer the State UI programs—in particular, to create the earnings history of an individual at a specific employer; this earnings history is necessary for calculating UI benefits. There are several limitations to using the wage records for economic analysis: the wage records do not indicate how many hours or weeks the individual worked (the individual could have worked 1 hour during the quarter, or could have worked all 13 weeks during the quarter), and the wage records are not specific to any particular establishment in the State for employers with multiple establishments.

Despite these inherent limitations, the wage records are useful for purposes other than administration of the State UI programs, particularly when merged with the QCEW microdata. The QCEW data include information on industry, geography, and other identifiers that allow linking establishments within firms. The QCEW-enhanced wage records are used to evaluate the effectiveness of government programs, in which the employment and earnings of individuals can be tracked after they receive their welfare payments or job training. The QCEW-enhanced wage records also are used by the States to analyze economic development such as employment histories of new hires in growing industries or locations, or employment and earnings of individuals involved in large layoffs. A relatively recent use of QCEW-enhanced wage records is to follow large groups of workers from one employer to another, which may be indicative of "SUTA dumping" (SUTA stands for "State Unemployment Tax Administration"). SUTA dumping refers to employers attempting to lower their tax payments by moving their workers out of one UI account with a high tax rate to a different UI account with a lower tax rate. A more thorough description of the analytical uses of QCEW enhanced wage records can be found in the May 2004 *Monthly Labor Review*.<sup>4</sup>

The QCEW-enhanced wage records also are used by academic economists who research labor market issues. Analysis of worker and job flows is one of the main research topics using the wage records.<sup>5</sup> QCEW-enhanced wage records also are used to study

the earnings losses of displaced workers, the impacts of government programs on earnings and employment, and the dynamic interactions between workers and employers.<sup>6</sup>

*Preparing the wage records for economic analysis.* The wage records microdata are very sparse with regard to data elements. The wage records have information on the employer's State UI account, the individual's Social Security number, and the individual's quarterly wages. We enhance the wage records microdata by merging in information on industry and location from the QCEW. We also enhance the wage records by merging in the employer identification number (EIN) from the QCEW. The Internal Revenue Service assigns the employer identification number to legal taxpaying business entities. The employer identification number will allow us to analyze whether workers are employed in the same firm, or in different firms, even if workers move to a different State.

For this analysis, it is crucial to identify individuals who were working in New Orleans when Hurricane Katrina struck in August 2005. These are the affected workers whom we expect to be displaced by the flooding and devastation of the city and surrounding areas. However, identifying the location of the individual's worksite is not always possible because the wage records identify the individual's statewide UI account rather than the specific establishment where the individual worked during the quarter. In Louisiana, in the second quarter of 2005, 62 percent of jobs are in businesses with one establishment in the State (this statistic is not available from the wage records data, but is immediately apparent when enhancing the wage records with the QCEW microdata). There is no difficulty determining the exact location of the worksite for individuals who work in single-establishment firms. The other 38 percent of jobs in Louisiana are in firms with multiple locations throughout the State. Our analysis of the wage records, enhanced with QCEW information, shows that 29 percent of the employment in multi-establishment businesses can be defined to a particular MSA. Thus, we know the MSA for 73 percent of employment in Louisiana—the 62 percent in single establishment firms, and the 11 percent (29 percent of 38 percent) of employment in multi-establishment firms in which all of the employer's establishments are located within the same MSA.

In the empirical work reported later in this article, we will refer to workers in the New Orleans MSA.<sup>7</sup> We can identify these workers from the enhanced wage records data as working in the New Orleans MSA. Because we are not able to define geography for workers who have employers with establishments in multiple MSA's, our label "Workers in the New Orleans MSA" in the forthcoming tables and charts refers to only a subset of all workers employed in the New Orleans MSA.

## Basic descriptive statistics

*Number of jobs and number of employers.* Louisiana and Texas sent their 2004 and 2005 wage records to BLS for our analysis of

the labor market impacts of Hurricane Katrina. Two transmissions of the third quarter 2005 data were sent—one transmission in spring 2006 accompanying the submission of the third quarter 2005 QCEW data to the BLS, and a second transmittal 3 months later (accompanying the submission of the fourth quarter 2005 QCEW data to BLS). As described later in this article, these two separate transmissions of wage records microdata provide important information for interpreting our analytical conclusions.

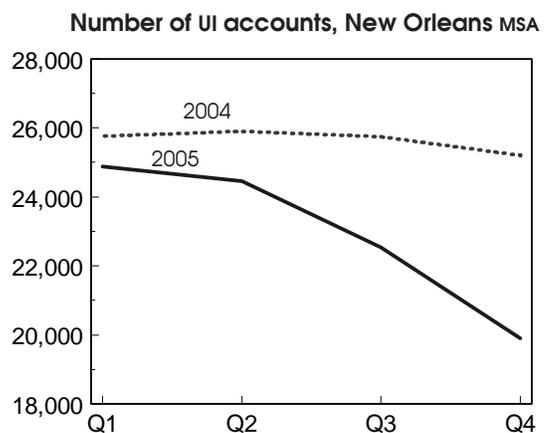
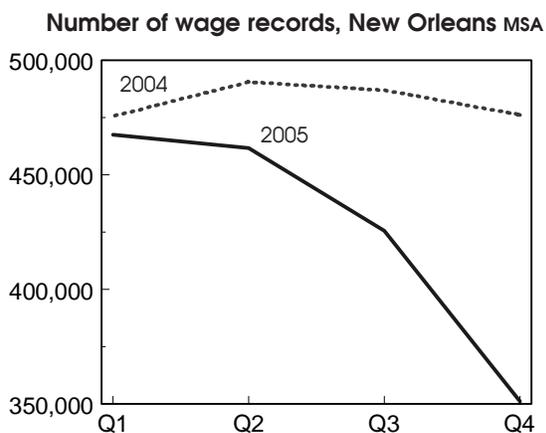
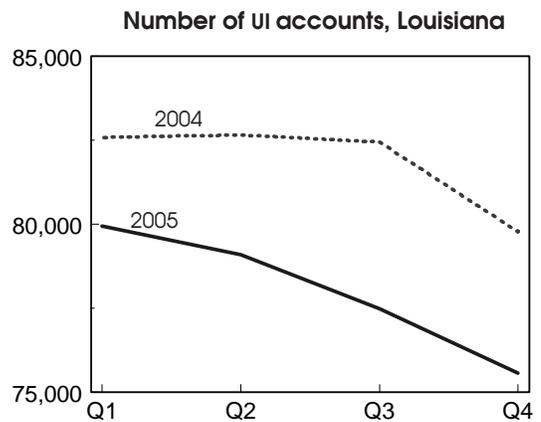
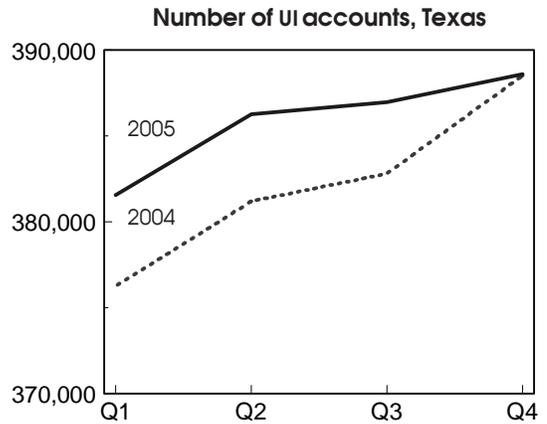
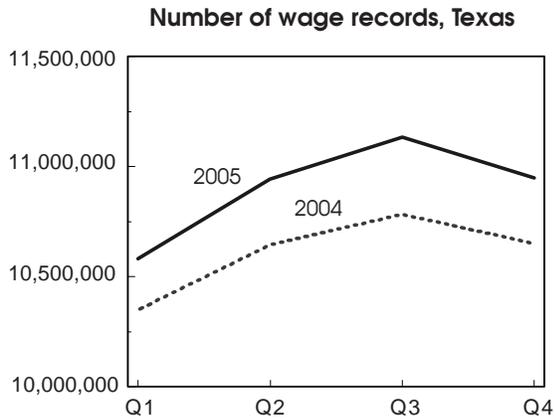
Table 1 reports on some basic descriptive statistics from the 2004 and 2005 quarterly wage records. The top half of the table reports the number of wage records for Texas and Louisiana, and the number of wage records where all establishments in the UI account are located in the New Orleans MSA. The bottom half of the table reports the number of UI accounts, which we refer to as the number of employers. Chart 1 illustrates the same statistics graphically.

In Texas, there are 10.3 million jobs reported in the first-quarter 2004 wage records data. In the Texas labor market, there is an increase in the number of jobs in the second and third quarters, followed by a decline in the fourth quarter. The Louisiana wage records data show 2 million jobs in the first quarter of 2004, with higher employment levels in the second and third quarters and a decline in the fourth quarter. The wage records data enhanced

**Table 1. Quarterly wage records and UI accounts in Texas, Louisiana, and New Orleans metropolitan statistical area (MSA), 2004 and 2005**

Period	Texas	Louisiana	New Orleans MSA
Number of wage records, 2004			
Quarter I .....	10,348,878	2,030,547	475,604
Quarter II .....	10,644,947	2,068,035	490,477
Quarter III .....	10,783,247	2,060,937	486,891
Quarter IV .....	10,650,813	2,010,233	476,212
Number of wage records, 2005			
Quarter I .....	10,582,806	2,027,316	467,410
Quarter II .....	10,943,773	2,023,430	461,718
Quarter III .....	11,133,727	1,965,717	425,474
Quarter IV .....	10,948,552	1,936,403	351,212
Number of unemployment insurance accounts, 2004			
Quarter I .....	376,253	82,581	25,758
Quarter II .....	381,205	82,655	25,901
Quarter III .....	382,819	82,441	25,743
Quarter IV .....	388,519	79,774	25,201
Number of unemployment insurance accounts, 2005			
Quarter I .....	381,577	79,941	24,880
Quarter II .....	386,260	79,085	24,459
Quarter III .....	386,979	77,468	22,537
Quarter IV .....	388,617	75,569	19,905

**Chart 1. Number of wage records and number of unemployment insurance accounts based on quarterly data from Texas, Louisiana, and New Orleans MSA, 2004 and 2005**



NOTE: MSA = Metropolitan statistical area.

with information from the QCEW identifies 476,000 workers in the New Orleans MSA in the first quarter of 2004, and the labor market in the New Orleans MSA has a quarter-to-quarter pattern in 2004 similar to the State of Louisiana.<sup>8</sup>

The statistics in table 1 clearly show the effects of Hurricane Katrina on the New Orleans MSA labor market. The number of jobs in the New Orleans MSA, as reported in the wage records data, falls from 461,718 in the second quarter of 2005 to 351,212 in the fourth quarter of 2005 — a 24-percent decline. The number of employers in the New Orleans MSA falls from 24,459 in the second quarter to 19,905 in the fourth quarter — a 19-percent decline.

Comparing the 2005 New Orleans MSA statistics with the 2004 statistics provides an initial measure of how Hurricane Katrina affected the local labor market. Between the second and fourth quarters of 2004, the wage records data show that the number of jobs and the number of employers in the New Orleans MSA both declined by 3 percent. If this is used as an indication of the expected seasonal pattern absent a major economic displacement, then the basic descriptive statistics in table 1 show that Hurricane Katrina decreased the number of jobs in the New Orleans MSA by 21 percent (24 percent in 2005 subtract 3 percent in 2004), as measured from the second to the fourth quarters, and similarly, Hurricane Katrina decreased the number of employers in the New Orleans MSA by 16 percent.

The statistics in table 1 for Texas also provide an informative comparison group. In Texas, the number of jobs between the second and fourth quarters of 2005 show a similar seasonal pattern to 2004. This finding suggests that what happened to the New Orleans MSA was a localized effect rather than a regional effect.<sup>9</sup> Using both the 2004 New Orleans MSA labor market and the 2004 and 2005 Texas labor markets as comparison groups, the statistics in table 1 and chart 1 show that Hurricane Katrina delivered a substantial economic shock to the New Orleans MSA in the latter half of 2005.

The statistics in table 1 and chart 1 for the State of Louisiana show less drastic effects relative to the New Orleans MSA. The number of jobs in Louisiana declined by 4.3 percent between the second and fourth quarters of 2005, relative to the 2.8-percent decline in the similar period of 2004. Furthermore, the wage records statistics reported in table 1 show that employment in Louisiana declined by 87,000 from the second to fourth quarters of 2005, whereas employment in the New Orleans MSA declined by more than 110,000 (which is undoubtedly an underestimate, because we are only measuring a subset of the New Orleans MSA labor market). This comparison suggests that the statewide loss of jobs is less than the loss of jobs in the New Orleans MSA, which is possible if individuals employed in the New Orleans MSA before Hurricane Katrina found work in other parts of Louisiana after the hurricane, or if there was an inflow of workers after the hurricane from other States into areas of Louisiana other than the New Orleans MSA.

*Possible caveats to simple interpretation.* The descriptive statistics in table 1 and chart 1 suggest a large loss of jobs and a large loss of employers in the New Orleans MSA following Hurricane Katrina. Could these empirical estimates be affected by issues of data quality: are these estimates true economic effects, or might they be (in whole or in part) an artifact of the data? This question is particularly relevant when using administrative data, such as wage records, that were designed for purposes other than economic analysis of natural disasters.

There are indications that the quality of the UI wage records might have suffered following Hurricane Katrina. From a conceptual perspective, the wage records are supposed to record any employment and wages earned at any point during the quarter. As such, the third quarter wage records should record all employment and wages during the months of July, August, and September. Hurricane Katrina hit New Orleans on August 29, 2005, and thus the normal seasonal employment patterns for July and early August 2005 should not be affected by the storm. Our finding that the number of UI accounts declined substantially in the third quarter leads to questions about non-reported wage records.

We have some evidence regarding late filing of the administrative wage records. As mentioned earlier, we received two submissions of the third quarter 2005 wage records from both Louisiana and Texas. For Texas, the initial submission of 2005 third-quarter wage records in spring 2006 had 369,434 employers reporting 10,923,716 jobs, whereas the latter submission of 2005 third-quarter wage records in summer 2006 had 386,979 employers reporting 11,133,727 jobs. These statistics imply that 4.5 percent of employers (accounting for 1.9 percent of jobs) filed their third quarter 2005 wage records with a delay. Some of this delay is undoubtedly attributable to Hurricane Rita, which made landfall on September 24<sup>th</sup> near the Texas-Louisiana border and devastated some coastal communities.

The late filing of 2005 third quarter wage records is much more striking in Louisiana than in Texas. The initial submission of 2005 third-quarter wage records from Louisiana had 67,111 employers reporting 1,804,019 jobs, whereas the later submission had 77,468 employers reporting 1,965,717 jobs. In Louisiana, 13.3 percent of employers (accounting for 8.2 percent of jobs) filed their 2005 third-quarter wage records with a delay. Many of these late reporters were businesses in the New Orleans MSA. These statistics on late reporting should not be surprising: Hurricane Katrina was a catastrophic storm in terms of lives lost and property damaged, and businesses that were affected by the storm might not have viewed prompt filing of their administrative tax data as a high priority.

This delayed reporting has two implications on the conclusions that we draw from the wage records data. First, on a general note, we have learned that caution is necessary when using wage records to estimate the economic effects of cata-

strophic events. The initial file of wage records from the affected State might be missing large numbers of businesses who will eventually file their wage records, and not accounting for these late reporters might bias the initial economic conclusions drawn from the analysis. Second, there might still be some businesses in the New Orleans MSA that have not yet filed their wage records for the third and fourth quarters of 2005. We can not quantify this, but we do note that the State of Louisiana has gone to remarkable efforts to obtain the highest quality data it can get for its Labor Market Information programs. However, if there are still some businesses that have not yet filed their wage records for the third or fourth quarters of 2005, the statistics presented in table 1 and chart 1 should be considered upwardly biased estimates of the labor market impacts resulting from Hurricane Katrina.

*Further aggregate analysis of the wage records.* Wage records are increasingly used as a statistical tool to understand the dynamic nature of the economy. Analysts can track individuals from one employer to another, and thus document the number of hires and separations occurring in any quarter. As we have learned from the new Business Employment Dynamics (BED) data and the new Job Openings and Labor Turnover Survey (JOLTS) data from BLS, the relatively smooth time series of net employment growth across time masks large underlying gross job flows and gross worker flows.<sup>10</sup> We have computed hires and separations statistics from the 2004 and 2005 Texas and Louisiana quarterly wage records. Hires are defined as an individual not working at an employer in the previous quarter yet working at the employer in the current quarter, and separations are defined as an individual working at an employer in the previous quarter yet not working at the employer in the current quarter. These quarterly hires and separations statistics are reported in table 2 and chart 2.

As seen in table 2, the wage records data show that there are approximately 2 million hires in any quarter in Texas. The number of quarterly separations in the Texas wage records data is between 1.6 million and 2.2 million, and the separations exhibit strong seasonal variation. By definition, the difference between hires and separations is the change in employment.<sup>11</sup> The seasonal pattern of the hires and separations data in the 2004 Texas wage records appears basically similar to the seasonal pattern of hires and separations in the 2005 data, which suggests that there are no obviously large differences that might be thought to be attributable to Hurricanes Katrina and Rita.

The effects of Hurricane Katrina are immediately obvious in the hires and separations statistics for Louisiana and the New Orleans MSA. The large decline in employment in the New Orleans MSA is due to a large increase in the number of separations, but not to a fall in the number of hires. The number of separations in the New Orleans MSA averaged roughly 100,000 per quarter in 2004, yet climbed to 126,000 in the third quarter of 2005 and climbed to 172,000 in the fourth quarter of 2005. Interestingly, the number of quarterly hires in the New Orleans MSA remained constant during 2005. Although this article presents no statistical

**Table 2.** Hires and separations based on quarterly wage records from Texas, Louisiana, and UI accounts in New Orleans metropolitan statistical area (MSA), 2004 and 2005

Period	Texas	Louisiana	New Orleans MSA
Number of hires, 2004			
Quarter I – II .....	1,925,295	408,237	102,181
Quarter II – III .....	2,001,630	400,021	98,221
Quarter III – IV .....	1,885,762	395,190	95,513
Number of hires, 2005			
Quarter I – II .....	2,025,559	415,425	97,868
Quarter II – III .....	2,138,387	441,106	90,399
Quarter III – IV .....	1,987,400	514,919	98,234
Number of separations, 2004			
Quarter I – II .....	1,629,226	370,749	87,308
Quarter II – III .....	1,863,330	407,119	101,807
Quarter III – IV .....	2,018,196	445,894	106,192
Number of separations, 2005			
Quarter I – II .....	1,664,592	419,311	103,560
Quarter II – III .....	1,948,433	498,819	126,643
Quarter III – IV .....	2,172,575	544,233	172,496

evidence for this supposition, this constancy of hiring after Hurricane Katrina is consistent with press accounts of construction workers moving into New Orleans to begin the massive demolition and reconstruction efforts necessary to rebuild the city.

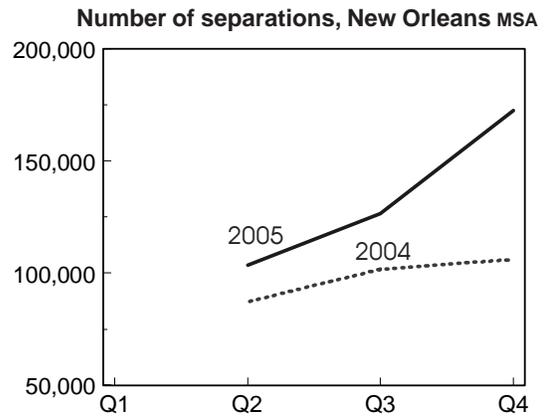
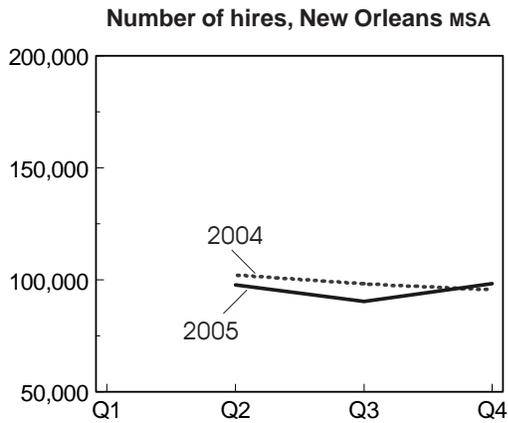
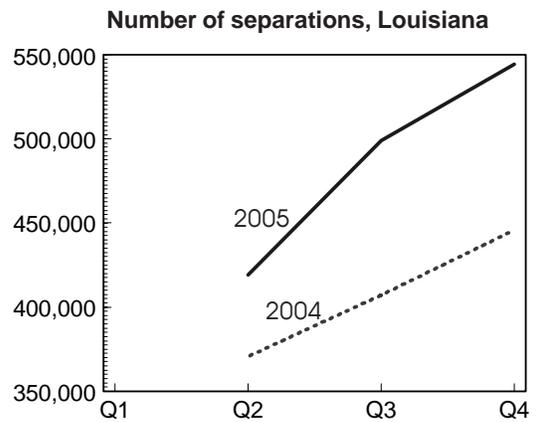
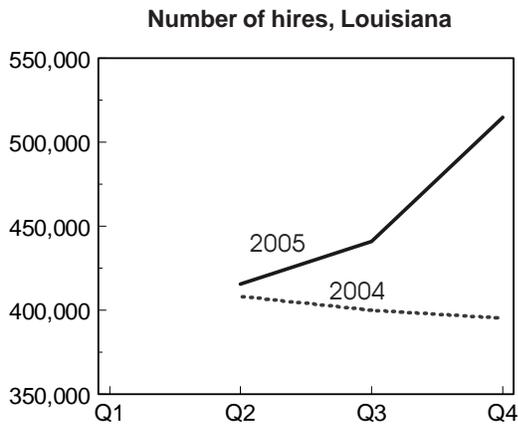
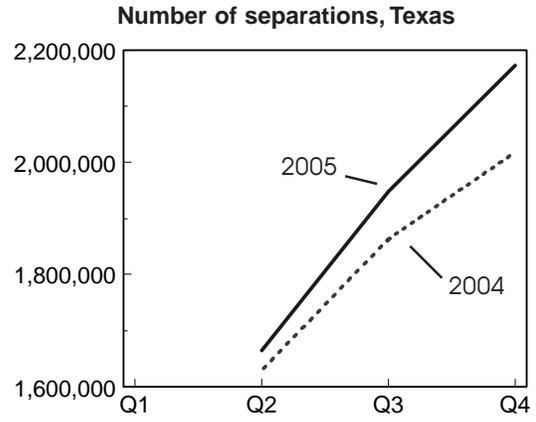
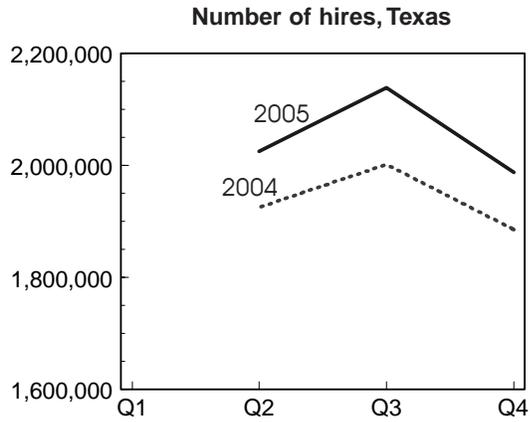
It is also interesting that both the number of hires and the number of separations in the State of Louisiana (table 2 and chart 2) increased during the latter half of 2005. The number of hires was 30 percent higher in the fourth quarter of 2005, relative to the fourth quarter of 2004, and the number of separations was higher by 22 percent over the same period. This is indicative of increased job churning within the State—exactly what one would suspect if persons displaced out of the New Orleans MSA were finding jobs in other parts of Louisiana, and construction workers were moving into the New Orleans MSA from elsewhere in the State. Further empirical analysis, which is beyond the scope of this article, would be informative on this supposition.

## An analysis of displacement

*Cross-State mobility analysis.* We now turn our analysis to a focus on wages, and ask how individuals' earnings were affected by Hurricane Katrina. There is a large economics literature that estimates the earnings losses resulting from job loss.<sup>12</sup> We build on this literature and analyze the short-term earnings of individuals who were displaced by Hurricane Katrina.

The measure of displacement we use is based on the earnings profiles of individuals who were working in the New Orleans MSA before Hurricane Katrina and were working in Texas after the hurricane. This is a restrictive measure of displacement in two respects: first, it requires that individuals cross a State line, and

**Chart 2. Number of hires and separations based on quarterly wage records from Texas and Louisiana, 2004 and 2005**



NOTE: MSA = metropolitan statistical area.

second, it requires that individuals are working both before and after the hurricane (the post-hurricane timeframe in this article is relatively short, due to having wage records data only through the fourth quarter of 2005). The estimates we present in this article are an initial estimate of some of the earnings losses resulting from Hurricane Katrina, and in the future when additional quarters of data become available, we hope to look at both the short-term and long-term earnings gains and losses of individuals displaced by Hurricane Katrina.

Table 3 presents the number of individuals who work in different States in consecutive quarters. Chart 3 illustrates these comparisons graphically. The first column of table 3 documents the number of individuals who were working in Texas in the previous quarter and working in Louisiana in the current quarter (these individuals may still be working in Texas in the current quarter).<sup>13</sup> We refer to these workers as “newly employed in Louisiana from Texas.” There are 7,897 individuals who are working in Louisiana during the fourth quarter of 2004 who were working in Texas, but not in Louisiana, during the third quarter of 2004. Interestingly, in 2004, the cross-State movement of workers the other way is of a similar magnitude: there are 7,904 individuals who are working in Texas during the fourth quarter of 2004 who were working in Louisiana, but not in Texas, during the third quarter of 2004.

Table 3 and chart 3 present the displacement effects of Hurricane Katrina, based on the cross-State mobility statistics. The number of persons moving from the New Orleans MSA into Texas rises quite rapidly in the last two quarters of 2005. There are 5,615 persons who are newly employed in Texas from the New Orleans MSA in the third quarter of 2005, which is much larger than the 1,608 persons classified as such in the same quarter of 2004. Similarly, there are 9,566 persons who are newly employed in Texas from the New Orleans MSA in the fourth quarter of 2005, which is also much larger than the 1,212 persons classified as such in the same quarter of 2004.

The statistics in table 3 enable us to compute a rough estimate of the number of persons displaced from the New Orleans MSA who found work quickly in Texas. In 2004, there are 3,164 persons who are working in the New Orleans MSA in either the second or third quarter and then working in Texas one or two quarters later ( $3,164 = 1,608 + 1,212 + 344$ ). The similar estimate for 2005 is 17,270 ( $5,615 + 9,566 + 2,089$ ). If 2004 serves as an expected cross-State mobility estimate for a normal year, then the difference between 2004 and 2005 is an estimate of how many persons were displaced from the New Orleans MSA as a result of Hurricane Katrina. This statistic is 14,106 persons (and we emphasize that this is an underestimate since our classification of persons as working in the New Orleans MSA misses many workers truly working in the New Orleans MSA). Furthermore, this is an estimate of the number of persons who moved into Texas and found work quickly—we are unable as of yet to estimate the number of persons who crossed State lines but did not quickly find work in Texas.

**Table 3.** Cross-State mobility statistics based on quarterly wage records from Texas, Louisiana, and New Orleans metropolitan statistical area (MSA), 2004 and 2005

Period	Newly employed in Louisiana from Texas <sup>1</sup>	Newly employed in Texas from Louisiana <sup>1</sup>	Newly employed in Texas from New Orleans MSA <sup>1</sup>
Cross-State mobility, 2004 ..			
Quarter I – II .....	7,792	7,702	1,215
Quarter II – III .....	8,803	9,160	1,608
Quarter III – IV .....	7,897	7,904	1,212
Quarter II –IV (No quarter III) <sup>2</sup> .....	1,383	1,507	344
Cross-State mobility, 2005 ..			
Quarter I – II .....	8,487	8,927	1,463
Quarter II – III .....	9,953	15,511	5,615
Quarter III – IV .....	13,462	21,556	9,566
Quarter II –IV (No quarter III) <sup>2</sup> .....	2,014	3,535	2,089

<sup>1</sup> “Newly employed, in Texas from Louisiana,” for example, is defined as 1) having a wage record in Louisiana in the previous quarter and no wage record in Texas in the previous quarter, and 2) having a wage record in Texas in the current quarter.

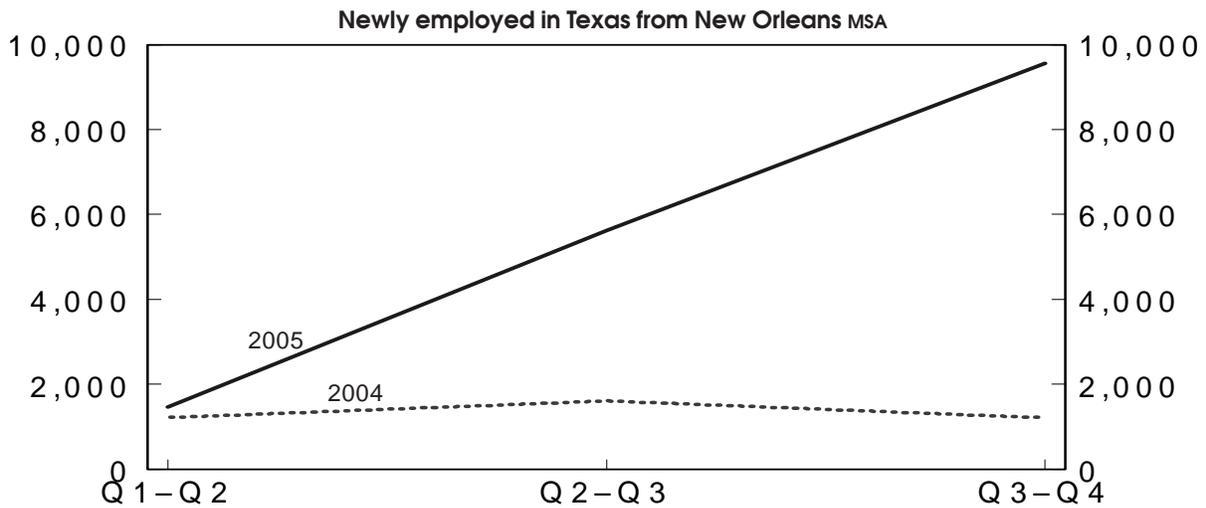
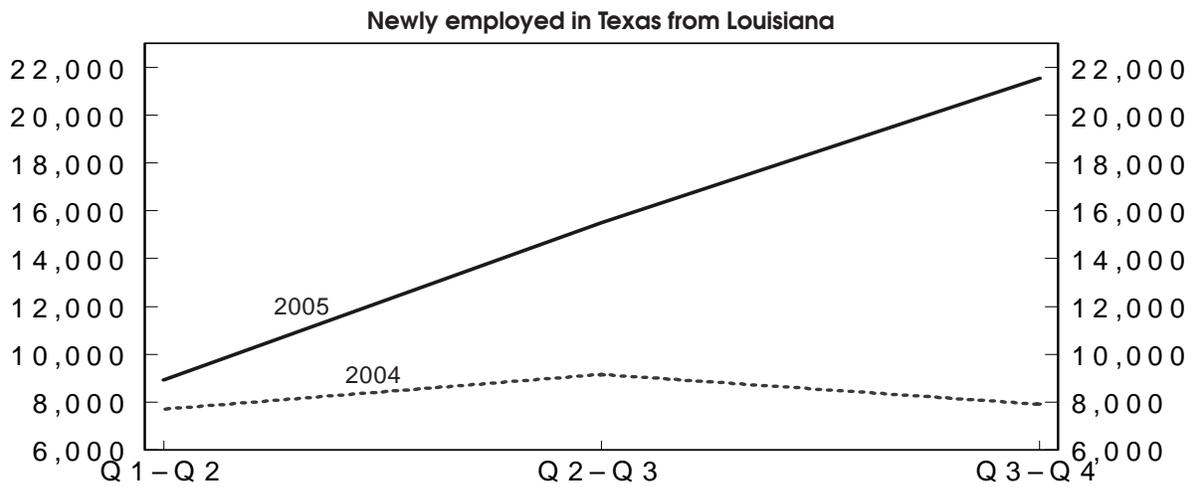
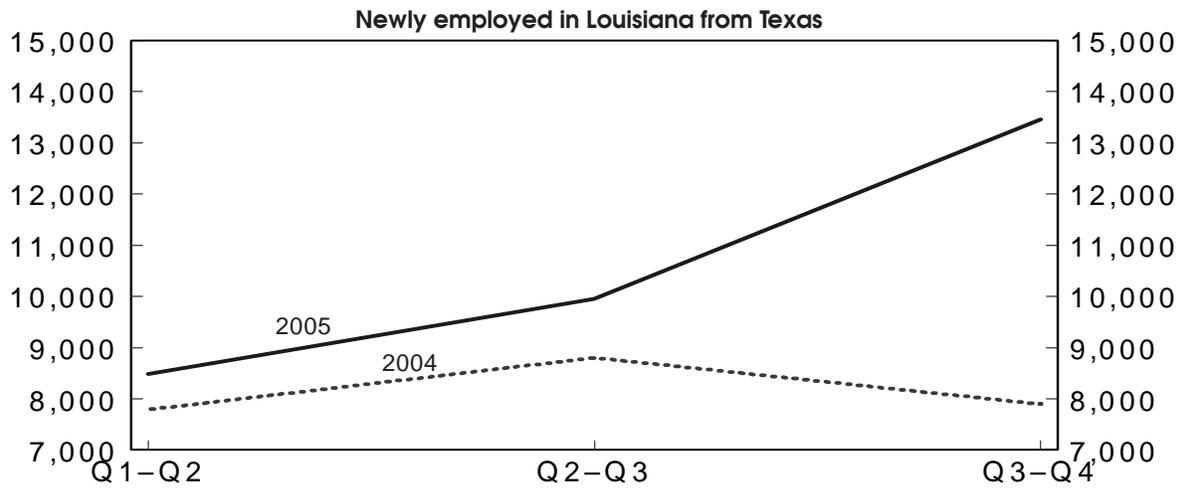
<sup>2</sup> Refers to persons moving across States from the second quarter to the fourth quarter, with no employment in either State in the third quarter of that year.

We should also note that the number of persons who enter the Louisiana labor market from Texas spikes upward in the fourth quarter of 2005. In the fourth quarter of 2004, there are 7,897 persons who move from the Texas labor market to the Louisiana labor market. In the fourth quarter of 2005, this number is 13,462. This is consistent with our observation mentioned earlier that the hires in the State of Louisiana increased during the latter half of 2005, which might be indicative of persons moving into Louisiana from other States.

*Earnings losses from displacement.* What happened to the earnings of the persons displaced by Hurricane Katrina? We provide some evidence on this by focusing on the persons moving from employment in the New Orleans MSA during the third quarter to employment in Texas during the fourth quarter. In 2004, this is a sample of 1,212 persons (from the final column of table 3), and in 2005, this is a sample of 9,566 persons. Earnings statistics for these two samples are presented in table 4.

The first column of table 4 presents earnings statistics for the 1,212 cross-State movers in the fourth quarter of 2004. In the third quarter, when these persons were working in the New Orleans MSA, their average quarterly earnings at all jobs in the New Orleans MSA is \$6,279. In the fourth quarter of 2004, when they were working in Texas (and perhaps also in the New Orleans MSA), their quarterly earnings from all jobs in both States is \$8,541. These statistics indicate that, on average, persons who moved from the New Orleans MSA to Texas in the fourth quarter

**Chart 3. Cross-State mobility statistics, based on quarterly wage records from Texas and Louisiana, 2004 and 2005**



NOTE: MSA = metropolitan statistical area.

**Table 4. Cross-State mobility statistics based on quarterly wage records from Texas, Louisiana, 2004 and 2005**

Category	2004 Quarterly III-IV movers	2005 Quarterly III-IV movers
Earnings, quarter III .....	\$6,279	\$5,585
Earnings, quarter IV .....	8,541	5,604
Earnings gain, quarter III-IV .....	2,262	20
10 <sup>th</sup> percentile .....	-3,680	-4,595
25 <sup>th</sup> percentile .....	-818	-2,248
50 <sup>th</sup> percentile .....	1,025	-285
75 <sup>th</sup> percentile .....	3,834	1,629
90 <sup>th</sup> percentile .....	8,471	4,541
Same employer identification number (EIN) (in percent) .....	15.1	10.9
Same industry (in percent) .....	33.9	40.8
Sample size (number) .....	1,212	9,566

NOTE: The sample is defined as 1) having a wage record in New Orleans in the third quarter and no wage record in Texas in the third quarter, and 2) having a wage record in Texas in the fourth quarter.

of 2004 experienced an earnings gain of \$2,262 in quarterly earnings.

The second column of table 4 presents earnings statistics for the 9,566 cross-State movers in the fourth quarter of 2005. In the third quarter, these persons earned, on average, \$5,585 in the New Orleans MSA. This earnings amount is lower than the 2004 amount reported in column 1, which might be suggestive of two things: perhaps lower wage individuals were more likely displaced by Hurricane Katrina, and that individuals displaced by Hurricane Katrina did not work all 13 weeks in the third quarter of 2005.<sup>14</sup> A similar labor supply explanation might explain why the fourth quarter average earnings of cross-State movers is lower in 2005 than in 2004: persons displaced by Hurricane Katrina probably spent some time not working while dealing with their sudden and unexpected displacement.

The sample of 9,566 persons who are newly employed in Texas from the New Orleans MSA in 2005 has a very different mean earnings profile than the sample of 1,212 persons who are newly employed in Texas from the New Orleans MSA in 2004. For 2004, we expect these persons to be voluntary movers—they moved into Texas because of improved job prospects or for personal reasons. On average, these persons experienced a large increase in quarterly earnings when moving from New Orleans to Texas. In 2005, there are undoubtedly some voluntary movers, but the sample (which in 2005 is almost eight times larger in magnitude than the 2004 sample) also contains the persons displaced by Hurricane Katrina. On average, these persons did not experience an increase in quarterly

earnings, and their level of earnings is substantially lower in 2005 than the group of voluntary movers in 2004. Table 4 presents the distribution of individual earnings growth from the third quarter to the fourth quarter. The median person in this sample in 2004 had quarterly earnings growth of \$1,025, whereas in 2005, the median person had earnings losses of \$285.

We emphasize that the earnings statistics in table 4 provide rough estimates of the short-run earnings effects only for workers who were displaced by Hurricane Katrina and found work in Texas relatively quickly. As time progresses, analysts will be able to add additional quarters of QCEW-enhanced wage records from both Louisiana and Texas for further refinement of the economic effects of displacement. As such, analysts can look at the long-term earnings effects, they can look at the earnings effects for individuals who might not have found work in Texas relatively quickly, and they can look at whether the displaced persons stay in Texas during 2006 or whether they migrate back to the New Orleans MSA.

Two other statistics in table 4 warrant mention: the percent of cross-State movers who stay in the same company, and the percent of cross-State movers who stay within the same industry. Defining companies by their employee identification number, we see that 15.1 percent of individuals who move from the New Orleans MSA to Texas in the fourth quarter of 2004 stay within the company, whereas 10.9 percent of movers in the same quarter in 2005 stay within the company. This indicates that voluntary movers are somewhat more likely to move across State lines and stay within the same national company. The statistics in table 4 also suggest that individuals who were displaced by Hurricane Katrina and who quickly get a job in Texas are more likely than voluntary movers to stay within the same two-digit NAICS industry code. In the 2005 wage records data, enhanced with QCEW information, the industry with the largest group of workers leaving New Orleans and getting a job in Texas the following quarter (1,876 persons, or 20 percent of the cross-State movers between quarters three and four) is in the accommodation and food services industry (NAICS 72), and 44 percent of the individuals in this industry in the cross-State sample find jobs in the same industry in Texas. In the same quarter of 2004, a smaller percentage (13 percent) of cross-State movers are from the accommodation and food services industry, and a smaller percentage (36 percent) of these persons stay in the same industry in their new job in Texas.

## Conclusions

Using 2004 and 2005 quarterly wage records data from Louisiana and Texas, enhanced with QCEW data, this article finds many striking employment and wage effects of Hurricane Katrina. The data show that the number of jobs in the New Orleans MSA fell by 21 percent as a result of Hurricane Katrina, the number of persons who were employed in Texas one quarter after working in the

New Orleans MSA is five times higher in the latter half of 2005, relative to the latter half of 2004, and the people who moved from the New Orleans MSA and quickly found work in Texas have lower earnings levels and lower earnings growth in the latter half of 2005, relative to the latter half of 2004.

This analysis is merely an initial look at the enhanced wage records data, and much more remains to be done. For example, the data suggest some interesting dynamics of mobility within Louisiana, as well as increased flows of workers both out of and

into the New Orleans MSA. Furthermore, this article emphasizes that the data are short-run estimates of the displacement effects resulting from Hurricane Katrina; additional analysis of long-term effects would be valuable when the data become available. The significance of this research is that QCEW-enhanced wage records are a useful tool for studying the employment and earnings dynamics resulting from Hurricane Katrina, and the methodology used in this article could be applied to other large displacements. □

## Notes

<sup>1</sup> Much of the text from this introductory paragraph has been taken from Wikipedia, the free encyclopedia, on the Internet at [http://en.wikipedia.org/wiki/Hurricane\\_katrina](http://en.wikipedia.org/wiki/Hurricane_katrina) (accessed June 2006).

<sup>2</sup> These statistics are from a June 2006 press release titled “Special Population Estimates for Impacted Counties in the Gulf Coast Area,” on the Internet at [www.census.gov/Press-release/www/emergencies/impacted\\_gulf\\_estimates.html](http://www.census.gov/Press-release/www/emergencies/impacted_gulf_estimates.html), accessed June 2006.

The seven parishes within the New Orleans metropolitan statistical area are: Orleans, Jefferson, St. Bernard, St. Tammany, Plaquemines, St. Charles, and St. John the Baptist.

<sup>3</sup> Much of the text from this paragraph has been taken from the Department of Labor Web site <http://workforcesecurity.doleta.gov/unemploy/uifactsheet.asp> (accessed June 2006).

<sup>4</sup> For a thorough description of the analytical uses of QCEW-enhanced wage records, see Richard L. Clayton and Jay A. Mousa, “Measuring labor dynamics: the next generation in labor market information,” *Monthly Labor Review*, May 2004, pp. 3–8.

<sup>5</sup> See Patricia M. Anderson and Bruce D. Meyer, “The Extent and Consequences of Job Turnover,” *Brookings Papers on Economic Activity*, 1994, pp. 177–236. For information about the LEHD program, see John M. Abowd, John Haltiwanger, and Julia Lane, “Integrated Longitudinal Employer-Employee Data for the United States,” *The American Economic Review Papers and Proceedings*, vol. 94, no. 2, May 2004, pp. 224–229.

<sup>6</sup> On the first topic, see Louis S. Jacobson, Robert J. LaLonde, and Daniel G. Sullivan, “Earnings Losses of Displaced Workers,” *The American Economic Review*, vol. 83, no. 4, September 1993, pp. 685–709. On the second topic, see Robert Kornfeld and Howard S. Bloom, “Measuring Program Impacts on Earnings and Employment: Do Unemployment Insurance Wage Reports from Employers Agree with Surveys of Individuals?” *Journal of Labor Economics*, vol. 17, no. 1, January 1999, pp. 168–197. On the third topic, see John C. Haltiwanger, Julia I. Lane, and James R. Spletzer, “Wages, Productivity, and the Dynamic Interaction of Businesses and Workers,” *Labour Economics*, forthcoming 2006.

<sup>7</sup> There are eight MSA’s in Louisiana (Alexandria, Baton Rouge, Houma, Lafayette, Lake Charles, Monroe, New Orleans, and Shreveport), plus the “balance of State” geographical area. See [www.state.la.us/census/93metro.htm](http://www.state.la.us/census/93metro.htm) for a map and other information about MSA definitions (accessed June 2006). The 2003 definition of the New Orleans MSA is the following seven parishes: Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. John the Baptist, and St. Tammany.

<sup>8</sup> Comparing the 2004 statistics in table 1 to the BLS employment statistics for the New Orleans MSA allows us to roughly calculate how much employment we are missing from not being able to assign a geography

to all wage records. A necessary first step in this calculation is to note that the wage records employment count exceeds the BLS statistics: the number of jobs in the first quarter 2004 Louisiana wage records is 2,030,547, compared with the Louisiana March 2004 employment estimate of 1,925,654 from the BLS Local Area Unemployment Statistics (LAUS) program. This overstatement is expected, because the wage records count all employment during the quarter rather than the conventional BLS “week of the 12<sup>th</sup>” reference period for a given month. In table 1, we report 475,604 jobs in the first quarter of 2004 in the New Orleans MSA, whereas the LAUS program reports 586,544 jobs in the New Orleans MSA for March 2004. Taking into account an overstatement of approximately 5.4 percent (calculated from the Statewide totals: 2,030,547 / 1,925,654) due to different reference periods, we estimate that our employment count for the New Orleans MSA is understated by approximately 23 percent.

<sup>9</sup> The summer and fall of 2005 was an active hurricane season in the Gulf of Mexico, and Hurricane Rita in September 2005 affected both western Louisiana and eastern Texas. We do not believe that Hurricane Rita severely affects our use of the Texas wage records as a regional comparison for what happened in the New Orleans MSA.

<sup>10</sup> For more information about the BED, see Richard L. Clayton, R. Jason Faberman, Akbar Sadeghi, James R. Spletzer, and David M. Talan, “Business employment dynamics,” *Monthly Labor Review*, April 2004, pp. 29–42. For more information about the JOLTS, see Kelly A. Clark and Rosemary Hyson, “New tools for labor market analysis: JOLTS,” *Monthly Labor Review*, December 2001, pp. 32–37.

<sup>11</sup> For example, the 1,925,295 hires in the second quarter of 2004 subtracted by the 1,629,226 separations shows a quarterly net employment change of 296,069. This quarterly net employment change is identical to the difference between the first quarter and second quarter employment levels reported in table 1: 10,644,947 subtracted by 10,348,878.

<sup>12</sup> For reviews of the literature, see Bruce C. Fallick, “A Review of the Recent Empirical Literature on Displaced Workers,” *Industrial and Labor Relations Review*, vol. 50, no. 1, 1996, pp. 5–16, and Lori G. Kletzer, “Job Displacement,” *Journal of Economic Perspectives*, vol. 12, no. 1, Winter, 1998, pp. 115–136.

<sup>13</sup> Transitions cannot be timed within quarters using wage records microdata. For example, if there is a wage record in Louisiana and Texas in same quarter, we do not know the number of weeks worked in Louisiana nor the number of weeks worked in Texas. The individual might even be holding the two jobs in different States simultaneously. By restricting on not working in one State in the previous quarter but working in that State in the current quarter, this allows us to claim with confidence that the individual “entered” the labor market of this State sometime during the current quarter.

<sup>14</sup> See Molly Garber, Linda Unger, James White, and Linda Wohlford, “Hurricane Katrina’s effects on industry employment and wages,” *Monthly Labor Review*, August 2006, pp. 22–39.