

The Economic Impact of Hurricane Katrina on its Victims:  
Evidence from Individual Tax Returns

Tatyana Deryugina, Laura Kawano, and Steven Levitt

ONLINE APPENDIX

January 2018

## Disaster Aid Response to Hurricane Katrina

Many resources were marshalled to help those affected by Hurricane Katrina.<sup>1</sup> In total, an estimated \$50 billion was given to Louisiana and its residents by the Federal government as a result of Hurricanes Katrina and Rita, not including flood insurance payments and loans. Much of this money undoubtedly went to New Orleans, as it was by far the worst affected area. Most of the aid was in the form of grants to rebuild public and private infrastructure, including housing and levees, rather than unconditional cash assistance. Some of the assistance was provided through mechanisms established by the Stafford Disaster Relief and Emergency Assistance Act of 1988 and the Disaster Mitigation Act of 2000. Specifically, about \$2.9 billion was given to New Orleans residents through FEMA's Individual Assistance program, which provides individuals with funds for temporary housing, repair, rebuilding, and other expenses. FEMA also provides Disaster Unemployment Assistance, which amounted to over \$320 million for the state of Louisiana (State of Louisiana, 2015a). An additional \$7 billion was given to New Orleans through FEMA's Public Assistance program, to support the rebuilding of public infrastructure (State of Louisiana, 2015b). A related program, the Community Development Block Grant Disaster Recovery Program (CDBG), gave over \$1.25 billion to New Orleans for infrastructure, economic development, and the rebuilding of affordable rental housing. The Hazard Mitigation Grant Program provided the city with \$360 million for mitigation of future damages.

In addition to standing disaster programs that provide cities and individuals with grants, the Small Business Administration (SBA) also makes available low-interest long-term loans for disaster victims. SBA lent approximately \$6.9 billion to 95,800 Louisiana recipients affected by Hurricanes Katrina or Rita (State of Louisiana, 2015a).

A few special programs were created specifically for the victims of Hurricane Katrina. The largest of these was the "Road Home Program," which helped New Orleans homeowners rebuild or sell their homes. Between the years of 2006 and 2013, about \$4.3 billion was given to New Orleans homeowners through this program. Additionally, "Road Home" funded the rebuilding of some rental properties through its Small Rental Property program, though this spending totaled only \$294 million. The largest inflow of funds to New Orleans was in 2007 (\$1.1 billion), but later years also saw non-trivial fund flows. For example, \$850 million was awarded to New Orleans residents in 2010 and \$650 million in 2011. In 2012 and 2013, the flow of funds slowed down substantially, with \$180 and \$58 million being awarded, respectively.<sup>2</sup>

Between 2005 and 2009, Congress also approved about \$16 billion in supplemental appropriations to the US Army Corps of Engineers, to be used for various flood mitigation activities, including rebuilding and strengthening structures used for flood control such as levees and floodwalls (Stern and Carter, 2013). While this figure includes funding for all areas affected by Hurricane Katrina and other 2005 hurricanes, the majority (\$14.5 billion) was directed to mitigation activities in Southeast Louisiana. The funding was approved through 7 different appropriation bills, the largest of which was for \$5.9 billion in 2009. As of the end of the 2012 fiscal year, \$2.85 billion of this money remained unobligated (Stern and Carter, 2013).

Although insurance payments are not disaster aid in a traditional sense, it is worth mentioning that the National Flood Insurance Program (NFIP) paid out a record \$16 billion in Hurricane Katrina-related claims. Over 167,000 claimants received payments averaging \$97,000 (King, 2013). Finally, it is estimated that charitable donations from the private sector for Hurricanes Katrina and Rita summed to about \$6.5 billion in the two years after the hurricanes (Giving USA, 2007).

---

<sup>1</sup> Unless otherwise noted, aid statistics are from <http://www.rebuild.la.gov>, are in nominal dollars, and include only the city of New Orleans rather than the broader area affected by Hurricane Katrina. However, in some cases, only figures for Louisiana as a whole are available. Hurricane Rita, a Category 5 hurricane that also hit Louisiana in 2005, is sometimes included in the aid total.

<sup>2</sup> We thank Jesse Gregory for sharing data on annual Road Home spending in New Orleans.

In 2005, the population of New Orleans was approximately 455,000. The combined spending of charities and the federal government in Louisiana in the aftermath of the 2005 hurricane season was approximately \$56.5 billion, excluding flood insurance and loans. Thus, a reasonable upper bound on per capita aid spending for New Orleans is approximately \$125,000.

### References

- Giving USA Foundation (2007). *Giving USA*, edited by M. Brown. Giving USA Foundation, Glenview, IL.
- King, Rawle O. (2013). The National Flood Insurance Program: Status and Remaining Issues for Congress. Congressional Research Service Report for Congress.
- State of Louisiana (2015a). Katrina + Rita 10 Years Later: Building a Smarter + Safer + Stronger + More Resilient Louisiana. Available: <http://gohsep.la.gov/Portals/0/Documents/FULLK-R10yearannivesarybullets-V32-8-4-15-5p.pdf>
- State of Louisiana (2015b). Katrina + Rita 10 Years Later: Building a Smarter + Safer + Stronger + More Resilient Louisiana. Parish Profiles. Available: <http://gohsep.la.gov/Portals/0/Documents/Workshop/KR10/ParishProfiles-8-25-15.pdf>
- Stern, Charles V. and Nicole T. Carter (2013). Army Corps Supplemental Appropriations: Recent History, Trends, and Policy Issues. Congressional Research Service Report for Congress.

## Brief Guide to the Online Appendix Tables and Figures

### Figures

- Figure A1 shows the estimated impact of Hurricane Katrina on economic and non-economic outcomes in a balanced sample (individuals who appear on a tax return each year between 1999 and 2013).
- Figure A2 shows the estimated impact of Hurricane Katrina on economic and non-economic outcomes when inverse propensity score weighting is not used.
- Figure A3 shows the estimated impact of Hurricane Katrina on Adjusted Gross Income (AGI), the probability of making any retirement withdrawals, the probability of not filing a tax return, and the probability of having any self-employment income.
- Figure A4 shows how average pay in New Orleans changed following Hurricane Katrina, relative to the average pay in the ten control cities.

### Tables

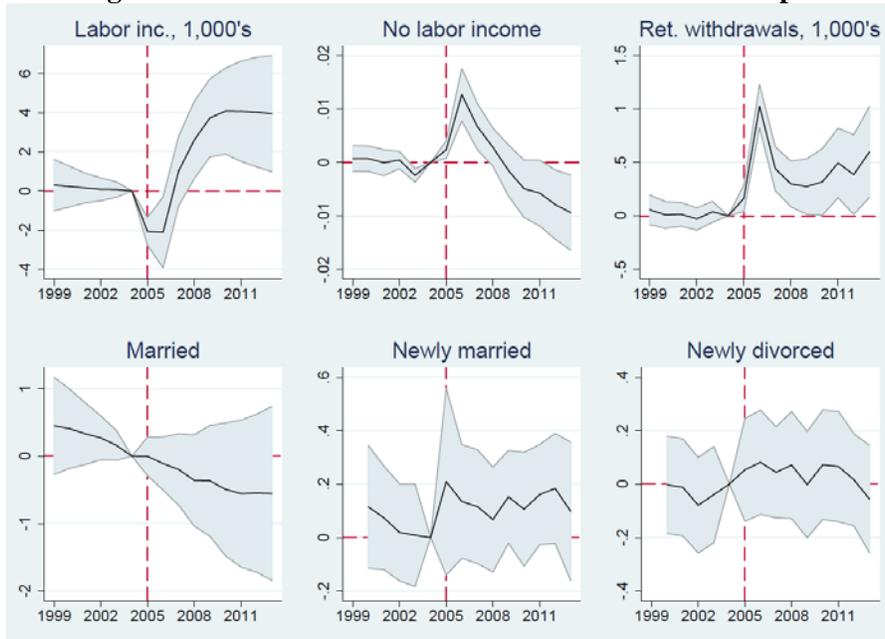
- Table A1 shows the 2000 Census characteristics of New Orleans residents by quintile of mean flood levels.
- Tables A2 and A3 show the estimated impact of Hurricane Katrina on economic and non-economic outcomes, respectively, for all 2004 New Orleans residents (point estimates and standard errors corresponding to Figures 3 and 4).
- Tables A4-A14 show the heterogeneity in the estimated effects of Hurricane Katrina on:
  - the probability of receiving unemployment benefits (A4)
  - self-employment income (A5)
  - the probability of moving (A6)
  - the probability of being in the same city as 2004 (A7)
  - the probability of being married (A8)
  - the probability of getting married (A9)
  - the probability of getting divorced (A10)
  - the number of dependents (A11)
  - the prevailing average pay in one's county of residence (A12)
  - labor income adjusted for cost of living, as measured by the COLI index (A13)
  - the cost-of-living index in one's county of residence (A14)
- Table A15 shows the heterogeneity in the estimated effects of Hurricane Katrina on labor income adjusted for cost of living and on the prevailing average pay in one's county of residence when those who do and do not return to New Orleans are combined into a single category.
- Table A16 shows city-level changes in average real incomes and wages between 2007 and 2009.

**Note:** We exclude the “returned” and “did not return” measures of heterogeneity from the mobility estimates reported in Tables A6 and A7 because of the mechanical relationship between these dimensions of heterogeneity and mobility outcomes.

Other estimates are available upon request from the authors.

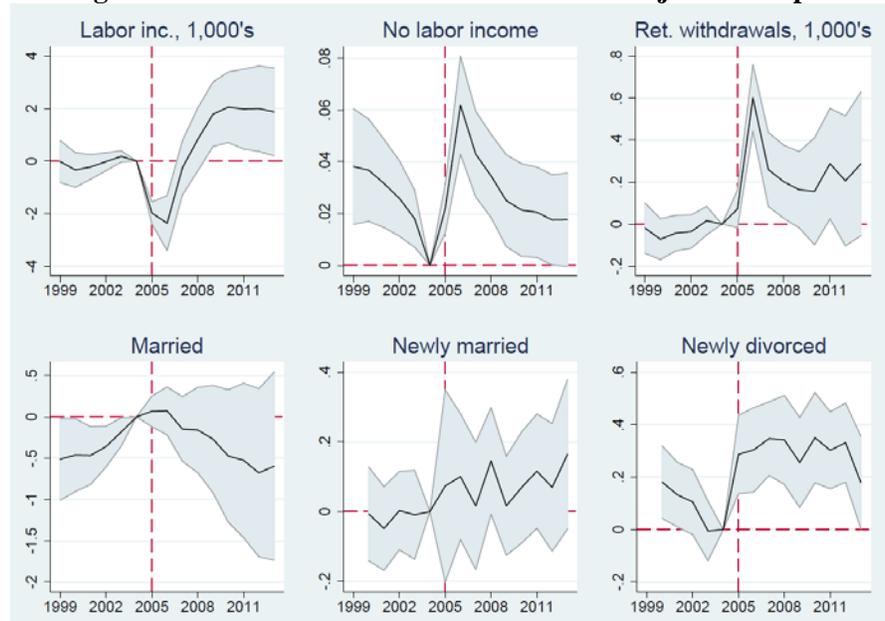
## Figures

**Figure A1. Effect of Hurricane Katrina in balanced sample**



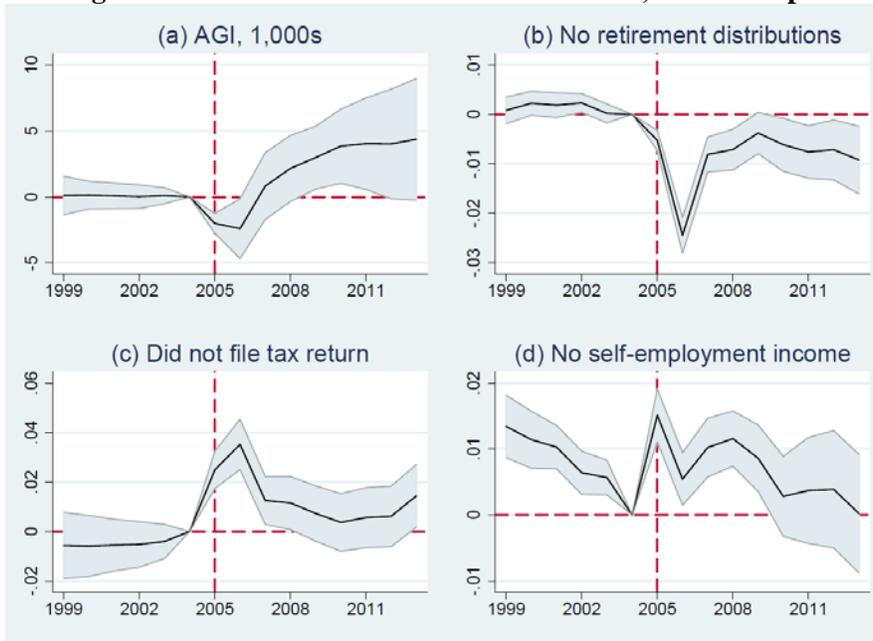
Outcome variables shown above graphs. Filled in areas represent 95 percent confidence intervals. Estimates for “married”, “newly married”, and “newly divorced” are scaled by 100. Sample restricted to individuals who appear on a tax return in each year between 1999 and 2013.

**Figure A2. Effect of Hurricane Katrina in unadjusted sample**



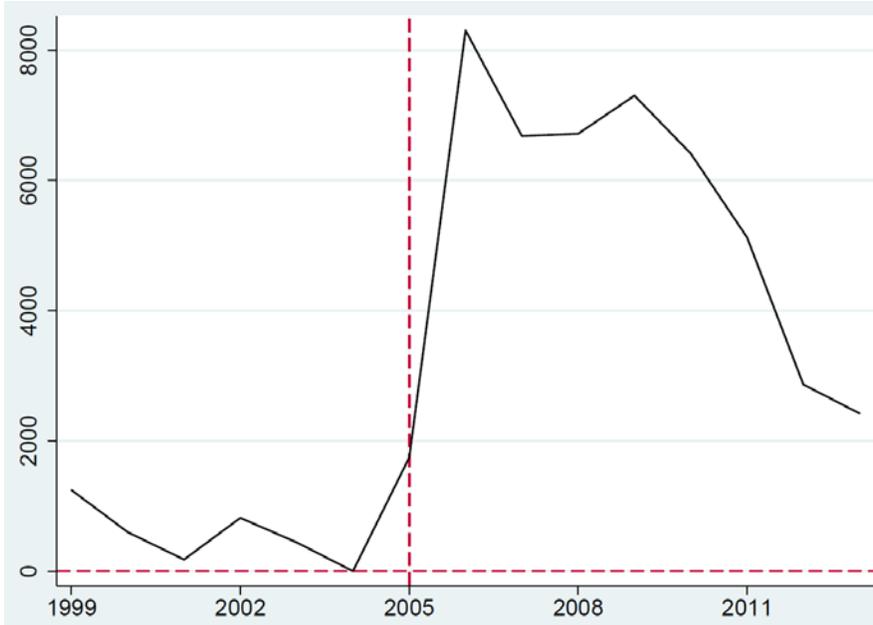
Outcome variables shown above graphs. Filled in areas represent 95 percent confidence intervals. Estimates for “married”, “newly married”, and “newly divorced” are scaled by 100. Estimates are not propensity-score weighted and the common support assumption is not imposed.

**Figure A3. Other effects of Hurricane Katrina, whole sample**



Outcome variables shown above graphs. Filled in areas represent 95 percent confidence intervals. AGI stands for “Adjusted Gross Income”.

**Figure A4. Changes in New Orleans average pay following Hurricane Katrina**



Source: Bureau of Economic Analysis. Graph shows the difference over time between average pay in New Orleans and the employment-weighted average pay in the control cities, relative to 2004.

## Tables

**Table A1: Characteristics of New Orleans Census Block Groups by Degree of Flooding**

Flood Depth Quintile	1	2	3	4	5
Mean flood depth	0.25	1.50	2.78	4.64	7.03
Minimum flood depth	0.00	0.00	0.00	0.00	0.76
Maximum flood depth	4.79	16.55	16.66	14.88	17.06
(Average) Median household income	\$31,119	\$28,095	\$27,745	\$25,898	\$36,235
Poverty rate	0.27	0.32	0.30	0.32	0.21
(Average) Median home value (owner occupied)	\$177,065	\$107,917	\$83,086	\$96,427	\$104,221
Proportion owner occupied	0.22	0.28	0.36	0.35	0.48
Proportion with a bachelors degree and higher	0.38	0.24	0.17	0.17	0.27
Proportion 65 or older	0.13	0.12	0.11	0.11	0.14
Proportion Black	0.40	0.71	0.76	0.84	0.65
Proportion Hispanic	0.04	0.02	0.02	0.03	0.03
Number of Census Block Groups	89	89	89	89	89

Source: FEMA, 2000 United States Census

**Table A2: Economic effects of Hurricane Katrina, full sample**

	Labor income	No labor income (×100)	Receives UI (×100)	Self- employment income	Retirement account withdrawals	Receives SSDI (×100)
1999 x NOLA <sub>2004</sub>	413 (542)	1.380 (1.005)	-0.068 (0.195)	-115** (48)	9 (59)	0.180** (0.071)
2000 x NOLA <sub>2004</sub>	326 (421)	1.196 (0.892)	-0.036 (0.193)	-83* (43)	-12 (48)	0.126* (0.066)
2001 x NOLA <sub>2004</sub>	217 (304)	1.065 (0.776)	-0.003 (0.159)	-87*** (31)	-6 (45)	0.072 (0.059)
2002 x NOLA <sub>2004</sub>	128 (231)	0.956 (0.671)	0.029 (0.168)	-43* (25)	-15 (38)	0.039 (0.047)
2003 x NOLA <sub>2004</sub>	95 (150)	0.771 (0.521)	-0.009 (0.140)	-39** (16)	24 (35)	0.057 (0.035)
2005 x NOLA <sub>2004</sub>	-2023*** (246)	0.940** (0.457)	27.304*** (1.355)	-129*** (20)	98** (44)	-0.069* (0.039)
2006 X NOLA <sub>2004</sub>	-2308*** (620)	4.204*** (0.866)	10.789*** (0.954)	144*** (26)	676*** (74)	0.017 (0.066)
2007 x NOLA <sub>2004</sub>	103 (650)	2.129*** (0.767)	-2.379*** (0.131)	107*** (41)	285*** (84)	0.212** (0.084)
2008 x NOLA <sub>2004</sub>	1299* (760)	1.260* (0.761)	-2.597*** (0.148)	107** (43)	207** (84)	0.300** (0.117)
2009 x NOLA <sub>2004</sub>	2265*** (781)	-0.032 (0.862)	-3.396*** (0.177)	85** (42)	181* (97)	0.282* (0.149)
2010 x NOLA <sub>2004</sub>	2525*** (855)	-0.401 (0.872)	-3.484*** (0.255)	134** (60)	192 (131)	0.196 (0.190)
2011 x NOLA <sub>2004</sub>	2481** (965)	-0.532 (0.859)	-2.360*** (0.211)	144** (62)	295** (141)	0.151 (0.234)
2012 x NOLA <sub>2004</sub>	2503** (1036)	-0.914 (0.869)	-1.884*** (0.200)	125* (65)	210 (164)	0.095 (0.261)
2013 x NOLA <sub>2004</sub>	2360** (1066)	-0.922 (0.897)	-1.781*** (0.157)	106 (88)	342* (186)	-0.025 (0.274)
Dep. var. mean	31,239	14.5	7.5	1,139	1,558	3.9
F-test of pre-trends (p-value)	1.00	0.79	0.99	0.00	1.00	0.05
Observations	5,445,285	5,445,285	4,254,298	4,254,298	4,254,298	5,445,285
R-squared	0.000	0.036	0.051	0.000	0.000	0.013

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes individual and year fixed effects. Reference year is 2004.

**Table A3: Effect of hurricane Katrina on household outcomes, full sample**

	Moved cities (×100)	In 2004 city (×100)	Number of kids	Married (×100)	Newly married (×100)	Divorced (×100)
1999 x NOLA <sub>2004</sub>		-1.618 (1.433)	-0.002 (0.005)	-0.268 (0.298)		
2000 x NOLA <sub>2004</sub>	-1.234* (0.741)	-1.709 (1.311)	-0.001 (0.005)	-0.135 (0.250)	0.163** (0.083)	0.031 (0.076)
2001 x NOLA <sub>2004</sub>	-1.270* (0.680)	-1.454 (1.164)	-0.003 (0.004)	-0.057 (0.199)	0.123* (0.074)	-0.011 (0.069)
2002 x NOLA <sub>2004</sub>	-1.322** (0.599)	-1.536 (0.945)	-0.002 (0.003)	-0.013 (0.134)	0.103 (0.066)	0.015 (0.072)
2003 x NOLA <sub>2004</sub>	-0.987** (0.478)	-1.414** (0.664)	-0.001 (0.002)	0.085 (0.093)	0.096 (0.072)	-0.067 (0.062)
2005 x NOLA <sub>2004</sub>	29.348*** (3.629)	-17.741*** (1.813)	-0.010*** (0.003)	-0.022 (0.103)	0.114 (0.147)	0.166** (0.083)
2006 X NOLA <sub>2004</sub>	7.133*** (1.617)	-26.806*** (2.595)	-0.010** (0.004)	-0.101 (0.167)	0.144 (0.097)	0.169** (0.085)
2007 x NOLA <sub>2004</sub>	0.523 (1.034)	-21.881*** (1.912)	-0.016** (0.007)	-0.391* (0.226)	0.043 (0.097)	0.199** (0.078)
2008 x NOLA <sub>2004</sub>	-2.262*** (0.824)	-18.401*** (1.631)	-0.016** (0.008)	-0.504 (0.309)	0.182** (0.085)	0.207** (0.095)
2009 x NOLA <sub>2004</sub>	-3.290*** (0.780)	-15.301*** (1.447)	-0.015* (0.009)	-0.697* (0.391)	0.044 (0.077)	0.124 (0.091)
2010 x NOLA <sub>2004</sub>	-3.524*** (0.763)	-13.087*** (1.307)	-0.016 (0.011)	-0.984** (0.474)	0.102 (0.090)	0.221** (0.091)
2011 x NOLA <sub>2004</sub>	-3.437*** (0.767)	-11.622*** (1.240)	-0.012 (0.014)	-1.095** (0.545)	0.156* (0.090)	0.168* (0.086)
2012 x NOLA <sub>2004</sub>	-3.602*** (0.733)	-10.097*** (1.186)	-0.013 (0.016)	-1.333** (0.587)	0.105 (0.100)	0.176** (0.083)
2013 x NOLA <sub>2004</sub>	-3.269*** (0.738)	-9.228*** (1.169)	-0.010 (0.018)	-1.327** (0.652)	0.199* (0.116)	0.056 (0.096)
Dep. var. mean	15.4	69.2	0.72	25.0	1.9	1.2
F-test of pre-trends (p-value)	0.10	0.06	0.82	0.25	0.37	0.68
Observations	4,246,212	5,445,285	4,254,298	4,254,298	3,721,304	3,721,304
R-squared	0.045	0.129	0.001	0.025	0.001	0.000

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes individual and year fixed effects. Reference year is 2004.

**Table A4: Heterogeneity in the effects of Hurricane Katrina on the probability of receiving unemployment payments**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	-0.010*** (0.003)	0.098*** (0.009)	-0.035*** (0.002)	-0.043*** (0.002)
Look-and-leave	0.033*** (0.004)	0.100*** (0.015)	0.007*** (0.002)	0.013*** (0.002)
Look-and-stay	0.018*** (0.004)	0.041*** (0.013)	0.010*** (0.001)	0.012*** (0.002)
Returned to N.O.	0.005*** (0.002)	0.032*** (0.004)	-0.001 (0.002)	0.001 (0.002)
Did not return to N.O.	0.011*** (0.002)	0.014*** (0.004)	0.006*** (0.002)	0.011*** (0.002)
Below median income in 2004	0.022*** (0.002)	0.061*** (0.007)	0.006*** (0.002)	0.006*** (0.002)
Younger than 30 in 2004	-0.011*** (0.002)	-0.045*** (0.005)	0.004* (0.002)	0.004 (0.003)
Older than 54 in 2004	0.015*** (0.002)	0.027*** (0.005)	0.003 (0.002)	0.007*** (0.002)
Non-home owner in 2004	-0.002 (0.002)	-0.002 (0.006)	-0.005*** (0.002)	-0.005*** (0.002)
Dep. var. mean	0.08		0.08	
Observations	4,141,733		4,141,733	
R-squared	0.027		0.052	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A5: Heterogeneity in the effects of Hurricane Katrina on self-employment income**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	250*** (86)	173** (76)	346*** (107)	237** (106)
Look-and-leave	-40 (67)	-71 (58)	-70 (80)	-12 (90)
Look-and-stay	233*** (80)	69 (59)	191** (93)	329*** (103)
Returned to N.O.	13 (32)	23 (31)	-48 (39)	34 (41)
Did not return to N.O.	-101*** (32)	5 (30)	-134*** (33)	-136*** (44)
Below median income in 2004	-251*** (63)	-232*** (53)	-229*** (68)	-264*** (74)
Younger than 30 in 2004	-222*** (58)	-100** (49)	-276*** (73)	-251*** (69)
Older than 54 in 2004	7 (89)	-75 (58)	-46 (77)	73 (115)
Non-home owner in 2004	-94 (60)	17 (54)	-105 (77)	-138* (72)
Dep. var. mean	1,142		1,142	
Observations	4,141,733		4,141,733	
R-squared	0.005		0.005	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A6: Heterogeneity in the effects of Hurricane Katrina on the probability of moving**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	-0.015*	0.024	-0.014*	-0.025***
	(0.009)	(0.019)	(0.007)	(0.007)
Look-and-leave	0.075***	0.190***	0.048***	0.031***
	(0.011)	(0.024)	(0.008)	(0.008)
Look-and-stay	0.022**	0.049*	0.012*	0.013**
	(0.011)	(0.027)	(0.007)	(0.006)
Below median income in 2004	0.016***	0.059***	0.004	-0.007
	(0.004)	(0.006)	(0.004)	(0.005)
Younger than 30 in 2004	-0.028***	-0.001	-0.033***	-0.030***
	(0.008)	(0.009)	(0.008)	(0.007)
Older than 54 in 2004	0.007**	-0.007	0.012***	0.004
	(0.003)	(0.005)	(0.004)	(0.004)
Non-home owner in 2004	0.015***	0.075***	-0.008**	-0.009***
	(0.003)	(0.007)	(0.004)	(0.003)
Dep. var. mean	0.14		0.14	
Observations	4,074,740		4,074,740	
R-squared	0.037		0.053	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, and did not live in a look-and-leave or a look-and-stay zip code.

**Table A7: Heterogeneity in the effects of Hurricane Katrina on the probability of being in the same city as 2004**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	-0.007 (0.028)	-0.005 (0.029)	-0.022 (0.028)	-0.001 (0.027)
Look-and-leave	-0.166*** (0.030)	-0.239*** (0.035)	-0.191*** (0.032)	-0.128*** (0.028)
Look-and-stay	-0.035 (0.031)	-0.061 (0.038)	-0.043 (0.033)	-0.021 (0.028)
Below median income in 2004	-0.035*** (0.008)	-0.059*** (0.010)	-0.042*** (0.009)	-0.024*** (0.008)
Younger than 30 in 2004	0.035*** (0.008)	0.028*** (0.009)	0.045*** (0.009)	0.034*** (0.008)
Older than 54 in 2004	0.002 (0.006)	0.014** (0.006)	0.006 (0.006)	-0.004 (0.008)
Non-home owner in 2004	-0.078*** (0.007)	-0.099*** (0.009)	-0.095*** (0.007)	-0.062*** (0.007)
Dep. var. mean	0.71		0.71	
Observations	5,082,810		5,082,810	
R-squared	0.157		0.161	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, and did not live in a look-and-leave or a look-and-stay zip code.

**Table A8: Heterogeneity in the effects of Hurricane Katrina on the probability of being married (x100)**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	-0.469 (0.658)	-0.798 (0.498)	-0.661 (0.626)	-0.236 (0.784)
Look-and-leave	-1.952*** (0.427)	-0.112 (0.223)	-1.146*** (0.295)	-3.165*** (0.624)
Look-and-stay	-0.599 (0.549)	0.283 (0.246)	-0.341 (0.399)	-1.116 (0.795)
Returned to N.O.	-0.929*** (0.297)	0.680** (0.266)	-0.288 (0.259)	-1.872*** (0.377)
Did not return to N.O.	4.479*** (0.336)	2.377*** (0.160)	4.279*** (0.285)	5.569*** (0.480)
Below median income in 2004	0.455 (0.427)	0.353 (0.237)	0.442 (0.356)	0.527 (0.589)
Younger than 30 in 2004	-2.562*** (0.950)	-1.360** (0.566)	-2.295*** (0.806)	-3.125** (1.235)
Older than 54 in 2004	1.758* (1.025)	1.231** (0.611)	1.627* (0.918)	2.054 (1.280)
Non-home owner in 2004	-0.916** (0.415)	-0.637** (0.283)	-0.901** (0.363)	-1.065* (0.579)
Dep. var. mean	25.45		25.45	
Observations	4,141,733		4,141,733	
R-squared	0.040		0.041	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A9: Heterogeneity in the effects of Hurricane Katrina on the probability of getting married (x100)**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	-0.298** (0.149)	-0.520** (0.204)	-0.173 (0.176)	-0.233 (0.144)
Look-and-leave	0.149** (0.066)	0.323*** (0.098)	-0.137 (0.100)	0.188*** (0.064)
Look-and-stay	0.084 (0.100)	0.055 (0.096)	-0.168 (0.144)	0.208** (0.105)
Returned to N.O.	0.327*** (0.067)	0.957*** (0.157)	0.241** (0.104)	0.071 (0.061)
Did not return to N.O.	0.609*** (0.087)	1.593*** (0.115)	0.666*** (0.098)	0.103 (0.099)
Below median income in 2004	0.122 (0.091)	0.231* (0.132)	0.150 (0.116)	0.044 (0.093)
Younger than 30 in 2004	-0.350 (0.221)	-0.403* (0.219)	-0.294 (0.250)	-0.359 (0.257)
Older than 54 in 2004	0.127 (0.101)	0.393*** (0.115)	0.188 (0.133)	-0.041 (0.128)
Non-home owner in 2004	-0.069 (0.131)	-0.464** (0.200)	0.022 (0.163)	0.074 (0.113)
Dep. var. mean	1.93		1.93	
Observations	3,640,588		3,640,588	
R-squared	0.002		0.002	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A10: Heterogeneity in the effects of Hurricane Katrina on the probability of getting divorced (x100)**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	-0.299*** (0.102)	-0.253** (0.106)	-0.352*** (0.127)	-0.296*** (0.108)
Look-and-leave	0.332*** (0.068)	0.388*** (0.078)	0.297*** (0.079)	0.322*** (0.073)
Look-and-stay	0.354*** (0.064)	0.386*** (0.065)	0.292*** (0.071)	0.366*** (0.079)
Returned to N.O.	0.225*** (0.077)	0.047 (0.099)	0.498*** (0.095)	0.191** (0.086)
Did not return to N.O.	-0.040 (0.062)	-0.029 (0.069)	-0.065 (0.062)	-0.034 (0.074)
Below median income in 2004	-0.026 (0.061)	-0.058 (0.074)	-0.009 (0.081)	-0.018 (0.070)
Younger than 30 in 2004	-0.266*** (0.093)	-0.144 (0.116)	-0.162 (0.119)	-0.363*** (0.102)
Older than 54 in 2004	0.188*** (0.064)	0.185** (0.089)	0.314*** (0.078)	0.132* (0.070)
Non-home owner in 2004	0.169 (0.103)	0.068 (0.127)	0.243** (0.121)	0.183* (0.102)
Dep. var. mean	1.24		1.24	
Observations	3,640,588		3,640,588	
R-squared	0.001		0.001	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A11: Heterogeneity in the effects of Hurricane Katrina on the number of dependents**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	0.039 (0.026)	0.021 (0.016)	0.042* (0.023)	0.046 (0.034)
Look-and-leave	-0.054*** (0.016)	-0.020*** (0.007)	-0.047*** (0.013)	-0.072*** (0.021)
Look-and-stay	-0.007 (0.016)	0.002 (0.006)	-0.008 (0.012)	-0.010 (0.023)
Returned to N.O.	-0.008 (0.007)	0.015** (0.007)	-0.011 (0.007)	-0.016* (0.009)
Did not return to N.O.	0.069*** (0.007)	0.032*** (0.005)	0.056*** (0.007)	0.093*** (0.010)
Below median income in 2004	-0.006 (0.009)	-0.013** (0.006)	-0.016** (0.008)	0.003 (0.012)
Younger than 30 in 2004	-0.023 (0.035)	-0.002 (0.021)	-0.003 (0.032)	-0.040 (0.043)
Older than 54 in 2004	-0.048 (0.031)	-0.042** (0.018)	-0.053* (0.027)	-0.048 (0.039)
Non-home owner in 2004	-0.026 (0.018)	-0.012 (0.014)	-0.024 (0.017)	-0.033 (0.021)
Dep. var. mean	0.73		0.73	
Observations	4,141,733		4,141,733	
R-squared	0.069		0.069	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A12: Heterogeneity in the effects of Hurricane Katrina on the annual average pay in one's county of residence**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	3741*** (218)	2922*** (264)	4070*** (326)	3949*** (177)
Look-and-leave	721*** (153)	847*** (195)	1444*** (233)	346*** (119)
Look-and-stay	991*** (152)	1261*** (203)	1768*** (244)	522*** (112)
Returned to N.O.	-1229*** (104)	-2789*** (196)	-1567*** (137)	-418*** (66)
Did not return to N.O.	-1811*** (201)	-2206*** (245)	-2993*** (261)	-1082*** (162)
Below median income in 2004	118 (82)	243*** (65)	104 (97)	73 (91)
Younger than 30 in 2004	361*** (115)	550*** (85)	238* (132)	306** (129)
Older than 54 in 2004	-548*** (69)	-527*** (86)	-493*** (74)	-557*** (68)
Non-home owner in 2004	-31 (88)	-42 (73)	-202* (104)	61 (101)
Dep. var. mean	42,739		42,739	
Observations	4,135,525		4,135,525	
R-squared	0.717		0.719	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A13: Heterogeneity in the effects of Hurricane Katrina on cost-of-living adjusted labor income**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	2,261 (1815)	-845 (1125)	230 (1625)	4406** (2235)
Look-and-leave	-6194*** (1506)	-4253*** (879)	-5077*** (1277)	-7584*** (1904)
Look-and-stay	-2596* (1459)	-1948** (861)	-2,028 (1281)	-3132* (1849)
Returned to N.O.	-1682*** (416)	954** (391)	-1262*** (400)	-3017*** (490)
Did not return to N.O.	5011*** (639)	2198*** (399)	4769*** (651)	6474*** (760)
Below median income in 2004	-1166* (702)	-174 (434)	-421 (653)	-1796** (878)
Younger than 30 in 2004	-1220** (554)	-257 (303)	-843* (468)	-1855** (768)
Older than 54 in 2004	1,722 (1454)	1,076 (655)	1,338 (1119)	2,356 (2000)
Non-home owner in 2004	1174* (712)	810 (535)	2207*** (778)	992 (807)
Dep. var. mean	37,681		37,681	
Observations	4,132,867		4,132,867	
R-squared	0.118		0.119	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A14: Heterogeneity in the effects of Hurricane Katrina on the cost-of-living index in one's county of residence**

	2005-2013	2005-2006 (short run effect)	2007-2008 (medium run effect)	2009-2013 (long run effect)
Reference category	4.027*** (0.805)	1.933** (0.753)	5.198*** (0.858)	4.351*** (0.817)
Look-and-leave	-1.009*** (0.210)	-1.779*** (0.255)	-1.032*** (0.229)	-0.625*** (0.187)
Look-and-stay	0.039 (0.213)	-0.424* (0.221)	0.125 (0.231)	0.223 (0.227)
Returned to N.O.	-2.874*** (0.083)	-6.912*** (0.185)	-3.658*** (0.126)	-0.866*** (0.097)
Did not return to N.O.	-6.951*** (0.374)	-6.229*** (0.403)	-8.537*** (0.414)	-6.559*** (0.354)
Below median income in 2004	-0.341 (0.256)	-0.616** (0.249)	-0.408 (0.287)	-0.097 (0.256)
Younger than 30 in 2004	0.134 (0.301)	0.444* (0.249)	-0.099 (0.307)	-0.035 (0.332)
Older than 54 in 2004	-0.045 (0.194)	-0.289* (0.169)	0.056 (0.205)	0.167 (0.209)
Non-home owner in 2004	-0.872*** (0.299)	-0.682** (0.269)	-0.999*** (0.322)	-0.820*** (0.314)
Dep. var. mean	99.12		99.12	
Observations	4,132,867		4,132,867	
R-squared	0.054		0.068	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A15: Heterogeneity in the effects of Hurricane Katrina, combining returnees and non-returnees into one category**

	Labor income adjusted for cost of living			Annual average pay in one's county of residence		
	2005-2006	2007-2008	2009-2013	2005-2006	2007-2008	2009-2013
Reference category	-564 (936)	647 (1429)	4933** (2030)	3600*** (210)	4695*** (270)	4595*** (137)
Look-and-leave	-4177*** (824)	-5163*** (1242)	-7799*** (1880)	540*** (153)	1203*** (190)	81 (109)
Look-and-stay	-2127*** (807)	-2271* (1244)	-3425* (1823)	1022*** (158)	1554*** (209)	299** (123)
Left N.O.	1775*** (314)	2772*** (507)	3318*** (579)	-2351*** (234)	-2481*** (208)	-825*** (119)
Below median income in 2004	6 (388)	-380 (611)	-1874** (837)	109 (78)	27 (110)	-26 (104)
Younger than 30 in 2004	-55 (257)	-789* (416)	-1918*** (730)	454*** (78)	206* (124)	249** (118)
Older than 54 in 2004	684* (401)	925 (861)	1,930 (1733)	-669*** (81)	-632*** (77)	-698*** (72)
Non-home owner in 2004	460 (396)	1907*** (657)	732 (696)	41 (73)	-140 (107)	132 (100)
Dep. var. mean		37,681			42,739	
Observations		4,132,867			4,135,525	
R-squared		0.118			0.719	

Standard errors (clustered by 2004 zip code) in parentheses. Significance levels: \* 10 percent, \*\* 5 percent, \*\*\* 1 percent. Each regression also includes the following fixed effects: individual, year-by-income-category, year-by-age-category, and year-by-homeowner category. Estimates in columns 2-4 are from a single regression. Reference category is a New Orleans homeowner who was between 25 and 44 years old in 2004, had above median income, did not live in a look-and-leave or a look-and-stay zip code, and did not leave the city in 2005-2006.

**Table A16: city-level changes in real income and wages,  
2007-2009**

	Per capita income	Average wage
Detroit, MI	-3.55	-4.33
Newark, NJ	-3.87	-2.24
Memphis, TN	-5.22	-1.28
St. Louis, MO	2.54	-1.25
Gary, IN	-1.36	-0.93
Birmingham, AL	-6.36	-0.44
Richmond, VA	-7.85	-0.13
Portsmouth, VA	3.46	-0.03
Baltimore, MD	4.21	1.01
Jackson, MS	-0.44	1.26

Source: Regional Economic Information System data (Bureau of Economic Analysis). Cell values are calculated by first converting income and wages into 2007 dollars, then computing the percentage change between 2007 and 2009.