The Effect of Disasters on Migration

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Abstract

While post-disaster migration can move vulnerable peoples from dangerous regions to relatively safe areas, little is known about the processes through which migrants select new homes. We refine a spatial econometric model of migrant flows to examine the characteristics of the destinations of migrants leaving the New Orleans area following Hurricane Katrina in 2005 and in 2006 when the pressure to evacuate was lessened. We find that migrants in 2005 settled close to New Orleans, with little consideration for destination amenities or characteristics. After the immediate threat had dissipated, however, migrants were more likely to consider economic characteristics of destinations.

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Introduction

Natural disasters can cause widespread destruction and weaken local economies. These impacts can lead to permanent migration away from disaster-affected areas. Such permanent, or even semi-permanent, migration induced by natural disasters has the potential to significantly reshape the distribution of national and global populations and economies (see e.g. McIntosh (2008)). Moreover, because migration moves people out of the path of some disasters, and potentially into the path of other ones, post-disaster migration has implications for the risks associated with future events (See (Gráda and O'Rourke 1997)). Finally, the migration itself and the loss of community cohesion suggests the need for consideration of mental health support in communities that will receive large numbers of disaster migrants (See (Weber and Peek 2012)).

Migration following large disasters is well-documented after major events like Hurricane Katrina, the 2011 Tohoku earthquake/tsunami and subsequent Fukushima nuclear disaster, and the 2004 Indian Ocean tsunami. Because of the pressures placed on the affected population, disasters can cause migration among a wider portion of the population than those who migrate normally (in a non-disaster related context) (See (Gray et al. 2014)). While the propensity for disaster-affected populations to migrate is documented, less is known about the preferences that impact the destination of disaster-affiliated migrants.

Factors in migration decisions are generally framed in the context of "push" factors and "pull" factors. Push factors cause people to want to leave the origin while pull factors cause people to want to go to a specific destination. High unemployment in the origin might push people to leave, for example. Similarly, a low cost of living might pull people toward a particular destination. An understanding of these pull factors is important for crafting natural disaster policies, understanding the likely evolution of disaster damages, and evaluating the prospects for repatriation. For example, if post-disaster migrants are credit constrained and unable to move to the optimal location, government subsidies for relocation costs might be justified. Similarly, if post-disaster migrants move to other areas that are at high risk of natural disasters, future disaster losses may actually increase following the migration.

Hurricane Katrina, which struck New Orleans in 2005, provides an ideal case study to examine the factors that influence the destination of disaster migrants. Most residents of New Orleans evacuated prior to the Hurricane, and following the storm most remaining residents were evacuated by the Federal Emergency Management Agency (FEMA). Approximately 1.5 million people evacuated the New Orleans area. 96% of New Orleans residents and 80% of residents surrounding the city eventually left their homes (See (Groen and Polivka 2008; Elliott and Pais 2006)). While a large number of evacuees were relocated to Houston by FEMA, Katrina evacuees relocated throughout the country. Nearly every state received FEMA funding for costs associated with supporting evacuees from Katrina. Many of those who evacuated following Hurricane Katrina never returned to the New Orleans area. These permanent migrants were generally younger, more likely to have children, and more likely to be black than those who returned to New Orleans (See (Groen and Polivka 2010)). There was also an increased flow of migrants from neighboring communities in the years following Katrina compared to the years prior to Katrina, indicating that those migrants who relocated to nearby communities were more likely to return than those who relocated to distant ones (See (Fussell, Curtis, and DeWaard 2014)).

In this paper, we examine the migration pull factors in terms of characteristics of the destinations of post-Katrina migration out of the New Orleans area by using data on the movement of IRS return filings between counties and a range of county-destination attributes. This paper contributes to the literature by estimating the relative importance of a range of factors in post-disaster relocation decisions. This work conveys a range of policy implications surrounding disasters and climate change. By identifying the characteristics that draw migrants following natural disasters, we inform future migration patterns as disasters grow more frequent. Our consideration of distance in the relocation decision also highlights the extent to which post-disaster migrants will be removed from similarly disaster-prone areas. Finally, we contribute to a small but growing set of studies that model migration in an explicitly spatial econometric context.

The rest of the paper proceeds as follows. In Section , we review the theoretical structure of migration decisions, in Section discuss our data sources, in Section present our estimating equations, and in Section present our results.

Conceptual_Underpinnings

From an economic standpoint, migration decisions are based on households comparing their expected lifetime utility in their current location (the origin) to a location to which they could move (the destination) (See (Greenwood 1985; Greenwood 1975)). Yun and Waldorf (2016) examine the decision about whether or not to migrate in an expected lifetime utility framework and focus on the extent to which Katrina induced migration by those who would not otherwise have migrated. The utility that a household expects to receive from living in a particular location depends on economic variables such as the wages and cost-of-living associated with an area, but also on non-economic variables such as environmental amenities, family and social ties, and perceptions about safety. A household will decide to migrate if the increase in expected lifetime utility obtained by moving from the origin to the destination exceeds the costs associated with moving. These costs include the financial costs associated with moving, as well as more abstract factors such as the social costs incurred by the move.

The decision to migrate is generally endogenous to migrant characteristics. Highly-skilled migrants who expect to receive large wage premiums are more likely to migrate than low-skilled workers (See Borjas (1987)). Similarly, migration is costly, Chiswick (1999)] note that those who are less credit-constrained are more able to afford the upfront costs associated with an optimal relocation decision.

Natural disasters, however, cause exogenous variation in the expected lifetime utility at the origin. For example, property damage would require repair costs in order to stay at the origin, and a weakened local economy would lower wages at the origin. Similarly, if a disaster causes households to update their beliefs about the likelihood and severity of subsequent events, this could lower the expected utility of remaining in the origin. These effects would cause households to re-evaluate their location decisions and potentially choose to migrate due to the decreased expected life-time utility at their origin (See (Yun and Waldorf 2016)).

In the event of major natural disasters like Hurricane Katrina and the Fukushima nuclear disaster, the push factors are relatively obvious; people leave the origin because of mandatory evacuation requirements, legal inability to return due to quarantines, loss of employment opportunities, etc. It is less obvious what draws migrants to particular locations following a disaster. One might be particularly concerned that post-disaster migrants are systematically different than those who choose to migrate under other circumstances. Disaster-related migrants, for example, might feel compelled to relocate more quickly or have less wealth with which to bear moving costs. Hence, they may not move to optimal locations in comparison to normal circumstances, or what Yun and Waldorf (2016) refer to as "double-victimization." Black et al. (2011) suggest that population movements due to disasters are typically short distance, though this conclusion seems to be counter to what happened in the aftermath of Hurricane Katrina.

Several variables have been suggested, and some tested, to explain the pull factors. Many of these are traditional in the gravity model literature of migration, such as wage and cost-of-living differentials, distance, moving costs, and general economic health of the destination (See (Borjas 1987; Rupasingha, Liu, and Partridge 2015)). Broadening the analysis leads to consideration of amenities, family ties, racial/ethnic affinities, migration networks, and institutions (See (McKenzie and Rapoport 2010; Nifo and Vecchione 2014)). The destination choice itself is dependent on the reason that drives the individual to migrate (See (Findlay 2011)). One might conclude that short or long-run hazard vulnerability would be major considerations, but Black et al. (2011) and Fielding (2011) emphasize the primacy of socioeconomic over environmental variables in current migration decisions, though on the basis of only anecdotal information.

Data

Our primary source of data is the Internal Revenue Service (IRS) Statistics of Income Division's migration data. These data report the flows of populations between counties based on changes in the location from which tax returns are filed. The IRS reports both outflow migration (tax returns and exemptions of filers who leave a county) as well as inflow migration (tax returns and exemptions that enter a county). The IRS data also include the number of filings and exemptions of people who do not move, providing a base-level population value that is comparable to the migration data. These reports include not only those filings that change counties but also the number of claimed exemptions that change counties and the annual gross adjusted income associated with the filings. In order to ensure the privacy of individual filers, the IRS suppresses observations in which fewer than ten filers migrated between an origin-destination pair. We treat these values as true zeroes.

Given our focus on New Orleans, we restrict our interest to outflow migration from the counties most severely affected by Hurricane Katrina in 2005.[^parish] We define our population affected by Hurricane Katrina as those residing in Cameron Parish, Orleans Parish, Plaquemines Parish, St. Bernard Parish, and Jefferson Parish. While there was some migration between affected regions (i.e., moving from a county that was severely affected to one that was slightly less affected), we remove these migrants from our sample to facilitate a simpler interpretation of outflow migrants. [^parish]: While Louisiana is organized into parishes rather than counties, we will use the term counties throughout this paper to facilitate discussion of destination locations.

We aggregate annual migration flows to each destination county across the five highly-affected origin counties between 2000 and 2010 The result is an 11-year panel of population flows to the 3,139 destination-county.[1] There is a non-zero number of migrants to approximately 5.4% of the county-year observations in our dataset. In 2005, however, over 13% of US counties received migrants from the affected area. Table **??** shows the total number of migrants from the affected area in each year of our sample, as well as the percentage of destination counties that received migrants.

We supplement the IRS migration data with a number of explanatory variables that might affect the relative attractiveness of a destination county. Annual county-level unemployment rates are obtained from the Bureau of Labor Statistics (BLS). Similarly, annual county-level racial composition data is obtained from the U.S. Census' intra-decennial Population Estimates Program. Average annual wage data is obtained the the BLS' Quarterly Census of Wages. For each variable we merge these data with the IRS migration data by county and year.

[1] There are 3,144 counties and county equivalents in the U.S. and the five affected counties are removed from the set of potential destination counties.

Methodology

OLS Models

In order to understand how Hurricane Katrina affected migration preferences, we estimate a series of models of migration outflow from the five affected counties. We specify the model

$$mig_{jt} = f(population_{jt}, g(distance_j), X_E, X_D, Time_t, Year2005 \times population_{jt}, Year2005 \times g(distance_j), Year2005 \times X_E, Yea \tag{1}$$

where mig_{jt} is the number of total migrants (filers and exemptions) that moved from the counties affected by Hurricane Katrina to county j in year t, and X_E and X_D are matrices of economic and demographic explanatory variables, respectively. The economic explanatory variable matrix, X_E is composed of $unemploy_{jt}$, the unemployment rate in county j in year t and pay_{jt}, the average annual wage rate in county j at year t. The demographic explanatory variables matrix, X_D, is composed of $black_{jt}$, which is the percentage of county $j's$ population in year t that is black, and LA_j, a dummy variable that takes on a value of one if county j is in Louisiana and a value of zero otherwise. Finally, $g(distance_j)$ is a function of the Euclidean distance between county j and Orleans Parish. We consider four distance specifications as controls: linear, cubic, and quartic functions of the Euclidean distance and a restricted cubic spline.[2]

Our key explanatory variable is Year 2005 which is a dummy variable that takes on a value of one if an observation occurs in 2005 and a zero otherwise. We interact this dummy variable with each of our other explanatory variables, so that the interaction terms capture the change in preferences over each pull factor variable relative to the other years in our sample, when a major disaster did not strike. If Hurricane Katrina shifted the relative importance of pull factors in the destination-selection process, we would expect these interaction terms to be statistically significant.

[2]The restricted cubic spline fits a series of cubic polynomials to the data. This allows different polynomial structures at different portions of the data's domain. The polynomials are constrained to ensure continuity across the polynomial specifications.

We consider a set of dependent variables for our regressions, and estimate the model separately with each potential dependent variable. First, we consider the number of migrants to county j itself. While this is not a gravity model per se because we do not estimate logs of migration, it remains in the spirit of a gravity model in which distance and other amenities affect migrant decisions. Next, because many counties receive no migrants at all we estimate a linear regression in which mig_{jt} takes on a value of one if any migrants are observed moving to a particular county in a given year. Finally, we estimate the percentage of migrants from the affected five-counties to each destination county and the percentage of incoming migrants in each destination county that came from the Katrina-affected counties. The former specification allows us to examine how Hurricane Katrina affected the distribution of migrant destinations in a way that is invariant to the total number of migrants. The latter informs the effect of post-disaster migrants on destination counties in the sense that counties will likely be able to absorb some number of migrants from a disaster-afflicted region, but as the percentage of a county's new population that is migrating away from a disaster rises there is increasing strain placed on the destination county.

Next, we expand our consideration to outflow migration from the greater New Orleans area in 2006. This allows us to consider migrants who did not permanently or semi-permanently leave the area immediately in the wake of Hurricane Katrina, but rather in subsequent years. Such migrants are relatively more likely to have left the New Orleans area because of a weakened economy than those who left in 2005.

We again estimate Equation 1, but we include a dummy variable for whether or not an observation corresponds to 2006 as well as the associated interaction terms. In the same spirit as the 2005 interaction terms, these coefficients are interpreted as the change in migration pull factors in the medium-term aftermath of Hurricane Katrina. This allows us to examine the migratory behavior of New Orleans area residents in 2006. Because these people weathered the immediate brunt of the storm and then chose to leave, these effects are likely to capture behavior that is more focused on leaving the weakened city for better opportunities.

Results

Baseline Results

In Table 4, we present the results of a linear probability model of whether or not any migrants were observed moving to a particular county from the New Orleans area. In general, the results across the entire 2000-2010 time range reflect relatively standard migration preferences. Counties that are large, or close to the New Orleans area are more likely to receive migrants than less populous counties or those that are far from southern Louisiana. Similarly, counties with lower unemployment and higher wages are more likely to receive migrants than counties with less robust economies. Counties with large black populations are more alluring to migrants, consistent with the largely black population of New Orleans moving to areas with which they have social and family connections.

In 2005, the year of the disaster, the relative importance of distance *increased* relative to the sample as a whole. While a one hundred-mile increase in distance decreases the probability that a county receives migrants from the New Orleans area by about 0.3 percentage points, in 2005 each additional one hundred miles decreased the probability of migration by an additional 0.5 percentage points. In general, economic factors were less important in determining potential destinations than in non-disaster affected years, the effect of the unemployment rate on migrant destinations in 2005 is statistically indistinguishable from zero. One exception to the economic effect is through the channel of wages, which became more alluring when the disaster struck. Counties with a greater percentage of black residents were more likely to receive migrants in 2005 than in other years, further evidence of the reliance on community ties when disasters strike.

In 2006, we find greater emphasis on economic characteristics than in the sample as a whole. Counties with low unemployment rates and a low cost of living are more likely to receive migrant flows from the Katrina area. We also find a slight reduction in the importance of population in determining the destination to which migrants move.

Table **??** presents the results for the OLS models based on migration out of the New Orleans area in 2005.

In each column we present an alternative specification for the functional form by which distance is related to the number of migrants who move to a given county. Across each model, we find consistent evidence that distance between a county and the New Orleans area and the population of the destination county are statistically significant indicators of the number of migrants who move to a particular county. Louisiana counties generally receive a greater number of migrants than outside counties across each of the specifications.

Because it is difficult to conceptualize the marginal effect of distance on migrants across each of our specifications, we present a graph of each distance control in Figure **??**. Across each of our distance control specifications, the number of migrants moving to a county is declining in distance.[3] These lines can be interpreted by comparing the functional value between various points along the x-axis. For example, the value of the spline function in green is 0 at a distance of 0 and approximately -1200 at a distance of 1000 miles. This means that a county 1000 miles from New Orleans would receive 1200 fewer migrants than a hypothetical, unevacuated county that was 0 miles from New Orleans. In each specification except the linear, the effect of distance is declining over the relevant range. The effect of a marginal mile of distance begins to flatten around 500 miles from the New Orleans area.

Migrants generally show a preference for more populous counties than for less populous counties. Across each distance specification the number of migrants who move to a given county increases by approximately 1,150 for every million residents of the destination county. For comparison, note that the effect of a marginal one million residents in a county has approximately the same draw as a county that is 1000 miles closer to New Orleans than an alternative.

We also find that migrants are much more likely to move to a county that is in Louisiana than one that is outside of Louisiana. This effect is relatively consistent across each of our distance controls so it is unlikely that this is merely capturing preferences for close counties over distant ones. Rather it is likely that residents of New Orleans feel an affiliation with the state of Louisiana and prefer to stay in the state for these reasons. This is consistent with the anchoring literature, which suggests that people feel a special affinity with the place that they perceive as "home" (Chamlee-wright and Storr 2009). A county in Louisiana is expected

[3] Population flows are relatively sparse between counties more than 1000 miles apart, and after 1000 miles the functional forms of the destination polynomials force the polynomials either upward or downward.

to receive about 1,000 more migrants than a comparable county not in the state. This effect is roughly equivalent to the number of migrants associated with an additional million residents in the destination county.

Conclusion

This study has focused on the characteristics of the destinations of post-Katrina migrants from the New Orleans area using IRS data on the movement of tax returns and exemptions in order to explain the pattern of out-migration. An understanding of the factors driving post-disaster migration is important both in planning for shifts in population and in assessing future damages from natural disasters.

We find that in 2005 – in the immediate aftermath of Hurricane Katrina – that distance and destination counties' percentage black population were the primary drivers of relocation decisions. Households also opted to live in Louisiana at a greater rate than one would expect based on distances alone. While it may appear surprising that unemployment did not provide statistically significant effects on migration, it is unsurprising given the urgency with which people left New Orleans in the immediate aftermath of the Katrina and the fact that FEMA determined at least the initial destination of many of them. Indeed, after removing Harris County – which received a relatively high proportion of the forced migrants from Katrina – from the sample, unemployment and wage rates appear to have an effect on migrant destinations, although the effect remains small relative to destination population and distance.

When we focus on those who left New Orleans in 2006, however, we find explanatory power behind the traditional covariates suggested in gravity models of migration flows. In particular, we find that people are moving to areas with relatively higher annual wages and relatively lower costs of living. As in 2005, we find a preference for moving to larger and closer counties. Because New Orleans was still severely weakened in 2006, these results can be interpreted as those who remained in New Orleans in the year following Katrina moving away from a weakened city the following year.

In each case, these results are robust to potential misspecification in the spatial dependence in both migration flows and the error term of the estimating equation. Failure to account for spatial correlation can bias OLS estimates. The consistency of our regression results between the spatial and OLS specifications, however, should provide some measure of confidence in other county-level migration models that do not explicitly model spatial correlation.

Our results suggest the need for caution when projecting the benefits of post-disaster migration as a tool for mitigating future disaster damages. Disaster-migrants tend to relocate to destinations that are close to their disaster-afflicted origin. Because disaster risks are correlated spatially, this suggests that those impacted by disasters will move to locations that are also susceptible to natural disasters and that aggregate exposure to disaster risks will remain relatively unchanged. Still, those who leave the disaster-afflicted area tend to move to high-population, urban areas rather than rural regions. If disasters that strike rural areas similarly induce migration towards population centers, such that migrants benefit from the greater economic opportunity in the cities.

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Tables and Figures

Table 1: Most Common State Destination for Migrants in 2005

State	Migrants	Percentage of Total
Texas	73,252	40.3%
Louisiana	45,014	24.8%
Georgia	14,480	7.96%
Mississippi	10,327	5.68%
Florida	5,951	3.27%
Tennessee	4,896	2.69%

Table 2: Most Common County Destination for Migrants in 2005

FIPS	County	State	Migrants	Percentage of Total
48201	Harris	Texas	38,033	20.9%
22033	East Baton Rouge	Louisiana	14,291	7.86%
48113	Dallas	Texas	9,971	5.48%
48439	Tarrant	Texas	5,575	3.07%
22105	Tangipahoa	Louisiana	4,758	2.62%
22055	Lafayette	Louisiana	3,377	1.86%
48029	Bexar	Texas	3,114	1.71%
22005	Ascension	Louisiana	2,912	1.6%
13089	Dekalb	Georgia	2,783	1.53%
47157	Shelby	Tennessee	2,769	1.52%

term	Flow	IHS	LP	Share
(Intercept)	14.8969	-0.0325	-0.02	0.0455
	(12.7597)	(0.1154)	(0.023)	(0.0278)
population	193.1327*	2.2289***	0.3992***	0.474**
	(110.3825)	(0.521)	(0.1027)	(0.2188)
distance	-1.8062***	-0.0268***	-0.0048***	-0.005***
	(0.4165)	(0.003)	(5e-04)	(0.0012)
un_rate	-12.6374	-1.605***	-0.3361***	-0.1494**
	(29.0974)	(0.346)	(0.0689)	(0.0688)
pay	0.7527*	0.0175***	0.0036***	0.002*
	(0.4318)	(0.0047)	(9e-04)	(0.001)
fmr	-3.9009	0.0195	0.0057*	-0.0071
	(3.7921)	(0.0155)	(0.0031)	(0.0076)
metro03nonmetro	4.2191	-0.1092**	-0.0266***	0.0138
	(7.3925)	(0.0498)	(0.0096)	(0.0168)
katrina	51.6205***	0.5167***	0.092***	-1e-04
	(12.9152)	(0.025)	(0.005)	(0.0038)
Adjusted R-Squared	0.037	0.305	0.288	0.114

Table 4: Any Migration to a County - Linear Probability Model

Population (Millions)	0.264^{***}	0.261^{***}	0.261^{***}
	(0.071)	(0.069)	(0.069)
Distance (Hundreds of Miles)	-0.003^{***}	-0.003^{***}	-0.003^{***}
	(0.001)	(0.001)	(0.001)
Louisiana Dummy	0.365^{***}	0.343^{***}	0.334^{***}
	(0.051)	(0.055)	(0.055)
Percentage Black	0.161^{***}	0.136^{***}	0.133^{***}
	(0.026)	(0.027)	(0.027)
Unemployment Rate	-0.005^{***}	-0.005^{***}	-0.004^{***}
	(0.001)	(0.001)	(0.001)
Annual Average Pay	0.005^{***}	0.004^{***}	0.004^{***}
	(0.001)	(0.001)	(0.001)
$Population(Millions) \times 2005$		0.032	0.066^{*}
		(0.030)	(0.040)
Distance (Hundreds of Miles) x 2005		-0.005^{***}	-0.005^{***}
		(0.001)	(0.001)
Louisiana Dummy x 2005		0.301^{***}	0.311^{***}
		(0.062)	(0.062)
Percentage Black x 2005		0.284^{***}	0.311^{***}
		(0.046)	(0.047)
Unemployment Rate x 2005		-0.001	-0.005^{**}
		(0.002)	(0.003)
Annual Average Pay x 2005		0.006^{***}	0.009^{***}
		(0.001)	(0.001)
$Population(Millions)x2006$			-0.033^{*}
			(0.019)
Distance (Hundreds of Miles) x 2006			-0.001^{***}
			(0.0004)
Louisiana Dummy x 2006			0.108^{**}
			(0.045)
Percentage Black x 2006			0.013
			(0.021)
Unemployment Rate x 2006			-0.001
			(0.001)
Annual Average Pay x 2006			0.0004
			(0.001)
Constant	-0.025	-0.021	-0.006
	(0.020)	(0.020)	(0.020)
Observations	34,359	34,359	34,359
R^2	0.353	0.377	0.372
Adjusted R^2	0.352	0.376	0.372
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 5: Migration to Each County as Share of Total New Orleans Out-Migration

Population (Millions)	0.003**	0.002**	0.002***
	(0.001)	(0.001)	(0.001)
Distance (Hundreds of Miles)	−0.0001***	−0.00005***	−0.00005***
	(0.00002)	(0.00002)	(0.00002)
Louisiana Dummy	0.007**	0.007**	0.008**
	(0.003)	(0.003)	(0.003)
Percentage Black	−0.0005	−0.001	−0.001
	(0.001)	(0.001)	(0.001)
Unemployment Rate	−0.00003***	−0.00003***	−0.00003***
	(0.00001)	(0.00001)	(0.00001)
Annual Average Pay	0.00001	0.00001	0.00001
	(0.00001)	(0.00001)	(0.00001)
$Population(Millions)x2005$		0.001	0.001
		(0.002)	(0.002)
Distance (Hundreds of Miles) x 2005		−0.00002	−0.00002
		(0.00002)	(0.00002)
Louisiana Dummy x 2005		−0.004	−0.004
		(0.003)	(0.003)
Percentage Black x 2005		0.001	0.001
		(0.001)	(0.001)
Unemployment Rate x 2005		0.00005*	0.00005**
		(0.00002)	(0.00003)
Annual Average Pay x 2005		−0.00000	−0.00000
		(0.00002)	(0.00002)
$Population(Millions)x2006$			0.001
			(0.001)
Distance (Hundreds of Miles) x 2006			−0.00001
			(0.00001)
Louisiana Dummy x 2006			−0.003
			(0.003)
Percentage Black x 2006			0.0005
			(0.001)
Unemployment Rate x 2006			0.00003**
			(0.00001)
Annual Average Pay x 2006			0.00000
			(0.00001)
Constant	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Observations	34,359	34,359	34,359
R^2	0.117	0.120	0.121
Adjusted R^2	0.117	0.119	0.120
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 6: Migration from New Orleans Area as Share of Total Destination In-Migration

	percLA2fips		
	(1)	(2)	(3)
Population (Millions)	−0.0001	−0.001	−0.001
	(0.001)	(0.001)	(0.001)
Distance (Hundreds of Miles)	-0.0002^{***}	-0.0002^{***}	-0.0002^{***}
	(0.0001)	(0.0001)	(0.0001)
Louisiana Dummy	0.060^{***}	0.047^{***}	0.048^{***}
	(0.013)	(0.014)	(0.015)
Percentage Black	0.004	−0.001	−0.001
	(0.003)	(0.003)	(0.003)
Unemployment Rate	0.00001	-0.0001^{***}	-0.0001^{***}
	(0.00004)	(0.00004)	(0.00004)
Annual Average Pay	0.00000	0.00000	0.00000
	(0.00000)	(0.00000)	(0.00000)
$Population(Millions)x2005$	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)
Distance (Hundreds of Miles) x 2005		0.006	0.006
		(0.004)	(0.004)
Louisiana Dummy x 2005		-0.001^{***}	-0.001^{***}
		(0.0001)	(0.0001)
Percentage Black x 2005		0.153^{***}	0.152^{***}
		(0.022)	(0.023)
Unemployment Rate x 2005		0.040^{***}	0.040^{***}
		(0.011)	(0.011)
Annual Average Pay x 2005		0.003^{***}	0.003^{***}
		(0.001)	(0.001)
$Population(Millions)x2006$		0.0002	0.0002
		(0.0001)	(0.0001)
Distance (Hundreds of Miles) x 2006			0.002
			(0.001)
Louisiana Dummy x 2006			−0.00000
			(0.00005)
Percentage Black x 2006			−0.010
			(0.014)
Unemployment Rate x 2006			0.004
			(0.003)
Annual Average Pay x 2006			0.0003^{***}
			(0.0001)
pay06			−0.00001
			(0.0001)
Constant	0.001	0.001	0.002
	(0.002)	(0.002)	(0.002)
Observations	32,679	32,679	32,679
R^2	0.146	0.253	0.253
Adjusted R^2	0.145	0.252	0.252
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 7: Inverse Hyperbolic Sine of Total Migrant Flow from New Orleans to Each County

Population (Millions)	1.411***	1.361***	1.354***
	(0.343)	(0.323)	(0.321)
Distance (Hundreds of Miles)	−0.020***	−0.018***	−0.017***
	(0.004)	(0.004)	(0.004)
Louisiana Dummy	2.072***	1.904***	1.864***
	(0.309)	(0.319)	(0.323)
Percentage Black	0.686***	0.547***	0.531***
	(0.131)	(0.129)	(0.128)
Unemployment Rate	−0.021***	−0.022***	−0.020***
	(0.004)	(0.003)	(0.003)
Annual Average Pay	0.022***	0.019***	0.017***
	(0.005)	(0.005)	(0.005)
$Population(Millions)x2005$		0.581**	0.757**
		(0.254)	(0.302)
Distance (Hundreds of Miles) x 2005		−0.031***	−0.035***
		(0.004)	(0.005)
Louisiana Dummy x 2005		2.222***	2.262***
		(0.272)	(0.280)
Percentage Black x 2005		1.575***	1.702***
		(0.211)	(0.222)
Unemployment Rate x 2005		−0.005	−0.029**
		(0.012)	(0.013)
Annual Average Pay x 2005		0.033***	0.050***
		(0.006)	(0.007)
$Population(Millions)x2006$			−0.120*
			(0.068)
Distance (Hundreds of Miles) x 2006			−0.008***
			(0.002)
Louisiana Dummy x 2006			0.467**
			(0.236)
Percentage Black x 2006			0.064
			(0.093)
Unemployment Rate x 2006			−0.001
			(0.007)
Annual Average Pay x 2006			0.003
			(0.002)
Constant	−0.087	−0.057	0.019
	(0.098)	(0.099)	(0.098)
Observations	34,359	34,359	34,359
R^2	0.385	0.422	0.418
Adjusted R^2	0.385	0.422	0.417
Note:			*p<0.1; **p<0.05; ***p<0.01