

# Macroeconomics 3 Presentation

Article review :

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# Introduction

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Study objects of the paper :

- Contribution of Natural Hazards to Wealth Inequality
- Contribution of Insurance Policies to Wealth Inequality

Focus on the empirical facts :

- The interaction between natural hazard and pre-existing social disparities
- The effect of private and public insurance

1. Introduction
2. Study Design
3. Wealth Inequality : the general effects
4. Wealth Inequality : a concrete example
5. Conclusion

# Study Design

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- Explaining Wealth with Socioeconomic Variables
- Datasets

# Explaining Wealth with Socioeconomic Variables

What is the effect of natural hazard on wealth inequalities ?  
How does this effect vary in function of socioeconomic variables associated to an individual ?

$$\widehat{wealth} = \hat{\alpha} + \hat{\beta} \cdot \log(\text{natural hazard damages}) + \hat{\gamma} \cdot X$$

With  $X$  socioeconomic variables (at the individual, local, and county levels) : Race, Foreign Born, Education, Married, Homeownership, Socioeconomic Status of the Neighborhood, etc... (discussed below)

- Panel Study Income Dynamics (PSID)
- Spatial Hazard Events and Losses Database (SHELD)
- Census
- Federal Emergency Management Agency (FEMA) Projects Summary (2016)



## Panel Study Income Dynamics (PSID)

- From 1968 to now, with a modification of followed individuals in 1999.
- Used sample : from 1999 to 2013, with a two-years interview period.
- Use of the restricted-access, geocoded version of the survey, with information on the neighborhood of the respondents.

## **Spatial Hazard Events and Losses Database (SHELD)**

- Maintained by the Hazards and Vulnerability Research Institute (HVRI) from 1960 to now.
- They collect information on 18 types of natural hazards and their associated fatalities and property damages.

## Census

Three datasets, from two different census :

- 2000 U.S Decennial Census Long Form
- 2006-2010 and 2011-2015 American Community Survey 5-year Summary Files

Use :

- Socioeconomic status of neighborhoods.
- Total population.
- Urban / rural status.

## Federal Emergency Agency (FEMA) Projects Summary (2016)

- Immediate Needs Funding (INF)
- Individual and Household Program (IHP)
- local husing vouchers, temporary units, financial grants, replaceent of property, etc...

# Wealth Inequality : the general effects

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# Wealth Inequality : the general effects

**Table 4. Coefficients from Longitudinal Random Effects Models Predicting Wealth and Considering FEMA Aid, Interval to Interval, 1999-2013**

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>
FEMA Aid, Logged	4.29 (1.52)*	0.13 (1.28)	2.28 (1.42)	-0.07 (1.28)	3.70 (1.59)*
Hazard Damage, Logged	2.68 (1.24)*	2.43 (1.23)*	2.55 (1.23)*	2.42 (1.23)	2.59 (1.23)*
<i>Individual-Level Factors</i>					
<i>Race</i>					
Black	-17.10 (4.86)*	-17.87 (4.85)*	-18.38 (4.85)*	-18.14 (4.85)*	-16.95 (4.86)*
Latino	-6.35 (8.89)	-7.39 (8.89)	-5.97 (8.88)	-5.74 (8.88)	-7.33 (8.89)
Other	-15.59 (9.85)	-15.53 (9.86)	-15.37 (9.86)	-15.43 (9.86)	-15.57 (9.85)
Foreign Born	-2.34 (22.77)	-2.23 (22.76)	0.17 (22.75)	-0.68 (22.75)	-2.95 (22.78)
Education	12.08 (2.19)*	12.47 (2.19)*	11.99 (2.19)*	12.07 (2.19)*	12.31 (2.19)*
Age	10.10 (2.17)*	10.41 (2.17)*	10.40 (2.17)*	10.47 (2.17)*	10.16 (2.17)*
<i>Family-Level Factors</i>					
Married	14.95 (3.21)*	14.85 (3.21)*	14.97 (3.21)*	15.10 (3.21)*	14.90 (3.21)*
Children at Home	1.56 (1.24)	2.01 (1.23)	2.10 (1.23)	2.19 (1.23)	1.53 (1.24)
<i>Household-Level Factors</i>					
Renter	-2.83 (3.36)	-2.38 (3.36)	-2.86 (3.36)	-2.80 (3.36)	-2.93 (3.36)
Moved	2.51 (2.51)	2.41 (2.51)	2.57 (2.51)	2.15 (2.51)	2.69 (2.51)
Wealth in 1999	139.52 (2.26)*	139.51 (2.26)*	139.62 (2.26)*	138.38 (2.27)*	138.51 (2.27)*
<i>Neighborhood-Level Factors</i>					
Socioeconomic Status	8.18 (1.66)*	8.32 (1.66)*	8.13 (1.66)*	8.35 (1.66)*	8.24 (1.66)*
<i>County-Level Factors</i>					
Total Population	1.36 (2.29)	1.27 (2.29)	1.25 (2.29)	1.31 (2.29)	1.19 (2.29)
Rural/Urban Scale	0.52 (1.14)	0.38 (1.14)	0.42 (1.14)	0.41 (1.13)	0.44 (1.13)

(continued)

# Wealth Inequality : the general effects

**Table 4. Coefficients from Longitudinal Random Effects Models Predicting Wealth and Considering FEMA Aid, Interval to Interval, 1999-2013 (continued)**

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>
<i>Property Insurance</i>					
Yearly Insurance Cost	8.12 (1.11)*	8.04 (1.11)*	7.98 (1.11)*	8.12 (1.11)*	7.89 (1.11)*
Year	3.08 (0.63)*	3.14 (0.63)*	3.13 (0.62)*	3.18 (0.63)*	3.10 (0.63)*
<i>Interaction Terms</i>					
FEMA*Black	-11.35 (2.30)*				-7.64 (2.45)*
FEMA*Latino	-9.62 (3.70)*				-3.61 (3.93)
FEMA*Other	-8.79 (4.54)				-8.10 (4.55)
FEMA*Education		4.42 (0.98)*			3.07 (1.06)*
FEMA*Own			-8.04 (2.14)*		-3.14 (2.29)
FEMA*Wealth in 1999				5.89 (0.90)*	5.19 (0.91)*
Constant	1748.91 (4.48)	1748.04 (4.48)	1748.27 (4.48)	1747.84 (4.48)	1748.69 (4.48)
N of Individuals	3,408	3,408	3,408	3,408	3,408

\*p < .05; two-tailed test.

## Wealth Inequality : the general effects

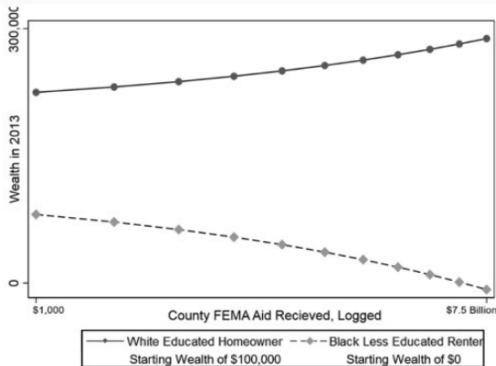
Wealth : Definition of PSID, sum of saving accounts, checking accounts, real estate holdings, equity, vehicles, farms, businesses, stocks, annuities / IRAs, minus all reported debts.  
Dollars : Due to right-skewed distribution, they use logarithm, standardizing all values to 2012 dollars.



## Wealth Inequality : a concrete example

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# Wealth Inequality : a concrete example



**Figure 3.** Estimated Wealth by Local FEMA Aid for a White, Educated, Homeowner with Starting Wealth of \$100,000 Compared with a Black, Less Educated Renter with Starting Wealth of Zero, All Else Equal

*Source:* Model 4 of Table 5. All other covariates in the model are held constant at their sample means.

*Note:* The x-axis is on a log-linear scale; labeled ranges are reported in actual, non-logged dollars to facilitate interpretation.

# Conclusion

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# Conclusion

In a broader scale, natural hazards shocks do provoke an increase in wealth disparities. This paper points out the role of natural hazards and insurance in the increase of the wealth gap.

In front of environmental risks, agents are differently exposed not only due to budget constraints, but also due to lacking insurance schemes that would provide a better and equitable coverage.

The authors call for further research on the precise mechanisms that make natural hazards affect wealth inequalities. Also, they underly the need for a reform of the current insurance system, that is too much based on wealth and not on vulnerability.