Drought and its Effects on Economy

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My research interest:

Effects of droughts on economy in Kenya

Outline

Definition of Drought

- Hi

Effects of droughts on economy

Computable General Equilibrium (CGE)

- **Robinson et al. (2010)**
  - 5 agro-ecological zones,46 production activities (incl. 35 zone specific agricultural production sectors), 22 commodity groups, 15 primary factors of production

Fixed (inputs)	Determined by model (outputs)
Capital stock	Domestic price of each commodity
Land (by region)	Land allocated across crops
Supply of labor per skill type	Real wages
Foreign capital inflow	Real exchange rate
Trade balance	

- The simulation use a 'balanced' macro closure in which aggregate **investment, government demand, and consumption are fixed shares of total absorption**
- Intermediate inputs into production are determined as fixed shares of the quantity of output

Effects of droughts on economy

Computable General Equilibrium (CGE) Models

- **Willenbockel (2011)**
  - Exploring range of scenarios for food price increase in 2030
    - 1. Baseline 2. Climate change 3. Climate change with adaptation 4. Adaptation only in sub-Saharan Africa
  - Global coverage, set of individual country models, linked through international trade
  - Climate change (incl. drought) modelled as changes in factor productivity (usually negative)

My suggestion - panel estimation

My interest: **Effects of drought on economy in Kenya**

- **Response variable**
  - Volumes of production (crop specific, total)
  - Profit per acre (Deschenes and Greenstone, 2007)
    - (Value of agricultural products - prod. expanses)/acres (crops, pasture, grazing)
- **Units of analysis**
  - Counties in Kenya $\times$ year
- **Explanatory variable of interest**
  - Dummy variable (0/1) drought occurred in a particular county and year or not
  - Several varieties - various specifications of drought:

My suggestion - panel estimation

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- **Explanatory variable of interest**
  - Dummy variable (0/1) drought occurred in a particular county and year or not
- **Units of analysis:** Counties in Kenya $\times$ year
- **Control variables ? - subject to availability**
  - GDP, soil quality data, population,average land area, average value assets, climate, degree days?
- **Estimation methods**
  - Fixed effects, SURE, Kalman filter, Box-Jenkins

My idea - panel estimation

$$Y_{i,t} = \alpha_i + \gamma_t + \delta D'_{i,t} + \beta \boldsymbol{X_{i,t}} + \epsilon_{i,t}$$

$Y_{i,t}$	=	Response variable (food production/price), county i in year t
α_i	=	Fixed effects, county i
δ	=	Effect of drought on economy
$D_{i,t}$	=	Indicator variable
		$D = 1$ if drought in county i in year t, $D = 0$ otherwise
β	=	Vector of effects of other covariates
$X_{i,t}$	=	Matrix of values of other covariates in county i in year t
$\epsilon_{i,t}$	=	Error term
γ_t	=	Year specific indicator?

Thank you for attention

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