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# **How a Race to the Bottom Can Make You Fat**

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# How a Race to the Bottom Can make You Fat

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## Motivation

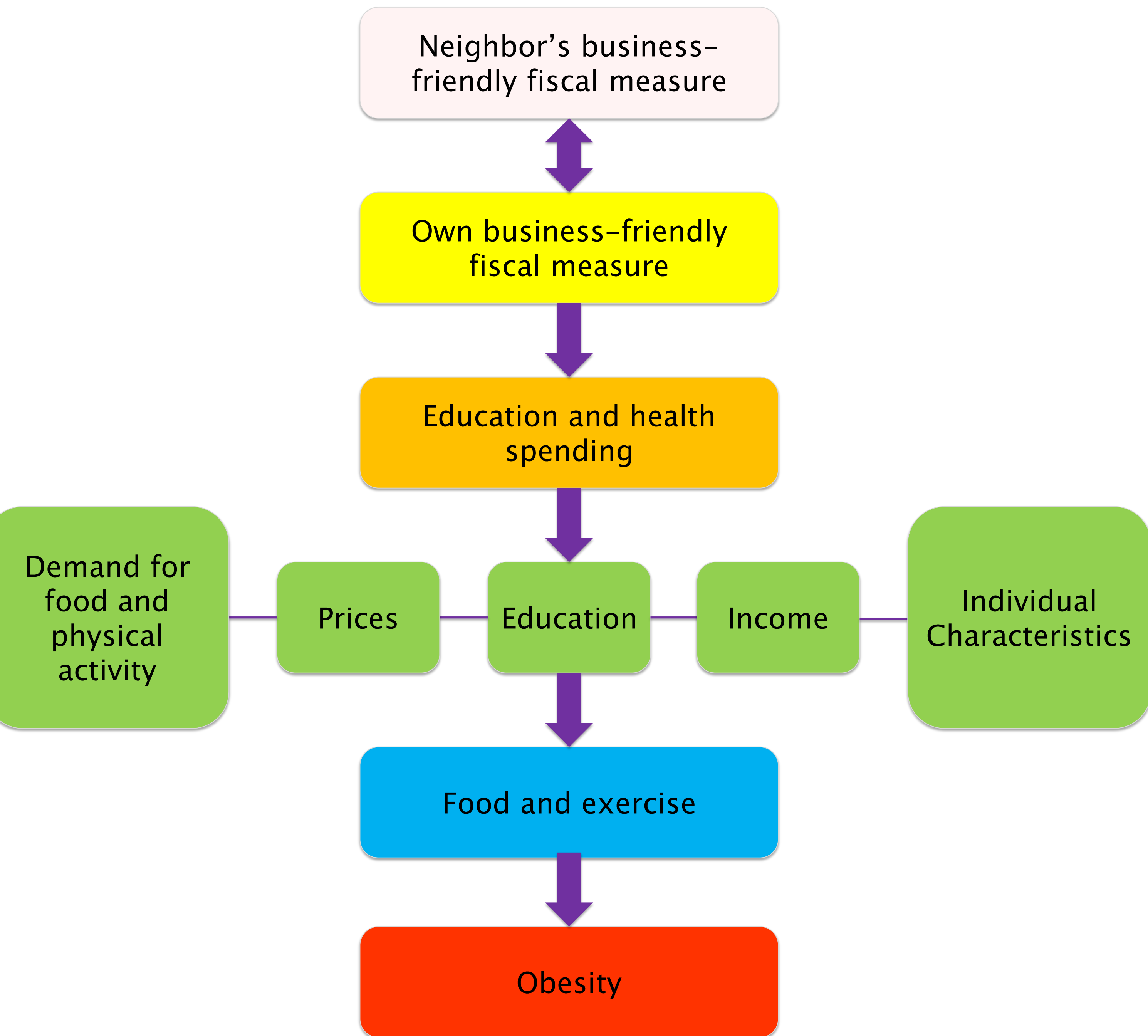
- 33% of adults and 17% of children in the United State are considered obese.
- Public health expenditures and school based nutrition programs lead to an improvement in self-reported health and obesity.
- Strategic interaction between different taxes, regulatory schemes and spending levels exist.
- A strong negative correlation between public education and health spending per capita and obesity rates.

## Objectives

Measure the effect of fiscal competition across states on obesity rates in the United States.

- Test the existence of fiscal competition across states.
- Measure the impact of changes in business friendliness of fiscal policies on education and health spending.
- Measure the effect of education and health spending on obesity.

## Conceptual Framework



## Empirical Model

- Equation 1: Measuring fiscal competition with spatial autoregressive model

$$g_{iy} = \rho \sum_{j=1}^n w_{ij} g_{jy} + \alpha_0 + \sum_{k=1}^K x_{iyk} \alpha_k + \mu_i + \mu_y + \epsilon_{iy}$$

- Equation 2: The determinants of education and health spending using a two-way fixed effects model

$$e_{iy} = \beta_0 + \beta_1 g_{iy} + \sum_{k=2}^K x_{iyk} \beta_k + \sigma_i + \sigma_y + \vartheta_{iy}$$

- Equation 3: Dynamic panel model to estimate the determinants of obesity

$$O_{iy} = \varphi O_{i,y-1} + \gamma_0 + \gamma_1 e_{iy} + \sum_{k=2}^K x_{iyk} \gamma_k + \theta_i + \theta_y + \omega_{iy}$$

$g_{iy}$  – the level of the fiscal policy measure in own state

$e_{iy}$  – the measure of education and health spending

$O_{iy}$  – the obesity rate in own state

$w_{ij}$  – the spatial weight assigned to states  $j$  and  $i$

$x_{iyk}$  – the  $k^{\text{th}}$  state characteristic

$\mu, \sigma,$  and  $\theta$  – state and year fixed effects

$\epsilon_{iy}, \vartheta_{iy},$  and  $\omega_{iy}$  – the regression error term

## Estimation Strategies

- Spatial weighting matrix: border, distance, border-distance, and truncated distance
- Estimate a dynamic panel model by system GMM
- Use neighbor's median age and income as instruments

## Data

- Unbalanced panel dataset for the 48 contiguous states from 1992 to 2010
- Obesity rates – the percentage of adults in state who are obese (CDC)
- Education and health spending per capita – spending on elementary and secondary education plus health expenditure divided by population (US Census)
- Measure of business friendliness: (1) business revenues per capita (2) business revenues per unit of public infrastructure spending (US Census)
- Other demographic variables

## Results

- A 1% increase in neighbor's fiscal measure raises own fiscal measure by 0.60% to 1.35%.
- A 1% increase in own fiscal measure raises own education and health spending per capita by 0.23% to 0.72%.
- 1% increase in education and health spending per capita reduces obesity rates by 0.31% to 0.50%.
- Education and health spending have a persistent effect on obesity rates.

Table: Results for our three equations

Equation	Fiscal competition		Determinants of Education and health spending		Determinants of obesity	
Dependent variable	Business revenues per capita	Business revenues per unit of public infrastructure spending	Education and health spending per capita	Education and health spending per capita	Obesity	
Parameter of interest	Neighbor's Business revenues per capita	Neighbor's Business revenues per unit of public infrastructure spending	Business revenues per capita	Business revenues per unit of public infrastructure spending	Lagged obesity	Education and health spending per capita
Border	.803*** (.204)	.747*** (.206)	.230*** (.078)	.254*** (.097)	.333*** (.125)	-.324** (.191)
Distance	1.352*** (.671)	1.113*** (.527)	.626*** (.283)	.720*** (.350)	.393*** (.135)	-.504*** (.240)
Border-distance	.688*** (.190)	.690*** (.193)	.282*** (.097)	.287*** (.108)	.337*** (.121)	-.311** (.171)
Truncated distance	.759*** (.326)	.600*** (.276)	.573*** (.227)	.689*** (.322)	.402*** (.125)	-.421** (.232)
Fixed effect dummies	Yes	Yes	Yes	Yes	Yes	
Observations	816	816	816	816	816	

Note: \* P value<0.15; \*\* P value<0.1; \*\*\* P value<0.05

## Conclusion

- Fiscal competition does exist.
- Fiscal competition crowds out education and health spending.
- Fiscal competition affects obesity rates in the short run, medium run and long run.
- Harmonizing fiscal policies could, not only improve the provision of public goods, but also reduce obesity rates.