



## *Causes of Changing Income Distribution in Vietnam*

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### **Vietnam in 1990**

- Poor, agrarian country
- 100 years war & turmoil
- failure of collectivization
- closed to world

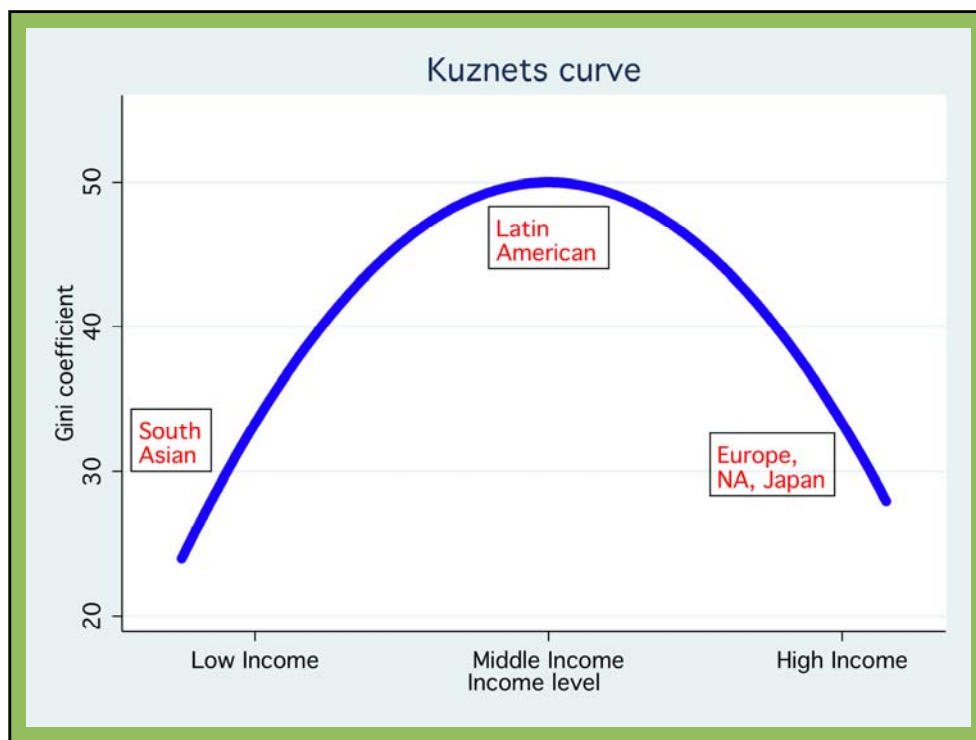
Đổi Mới (Renovation) 1990

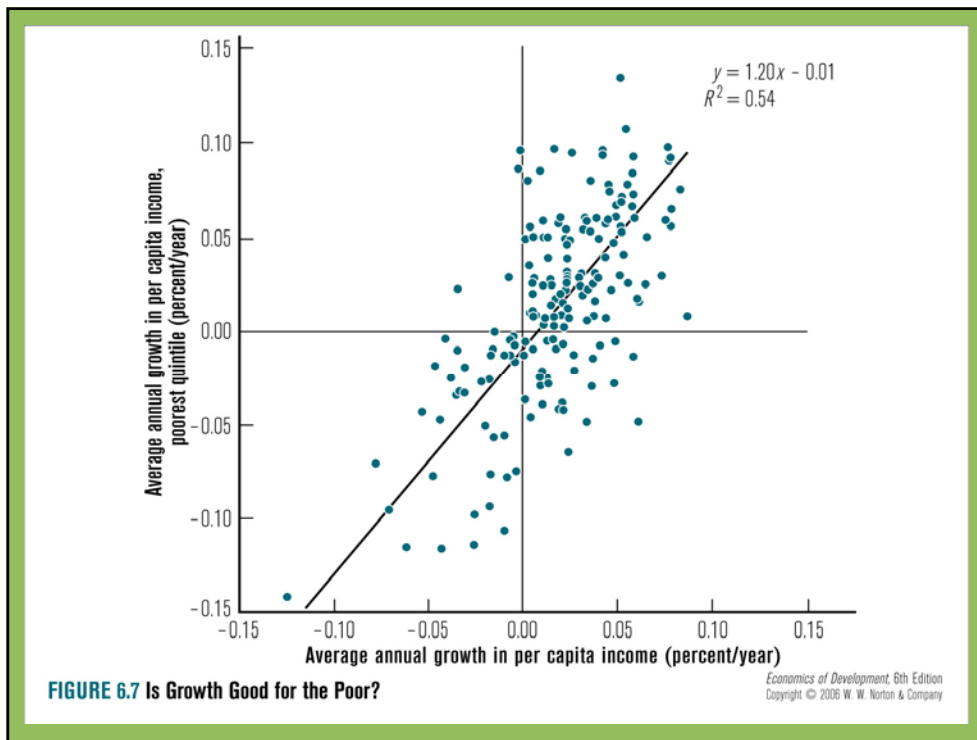
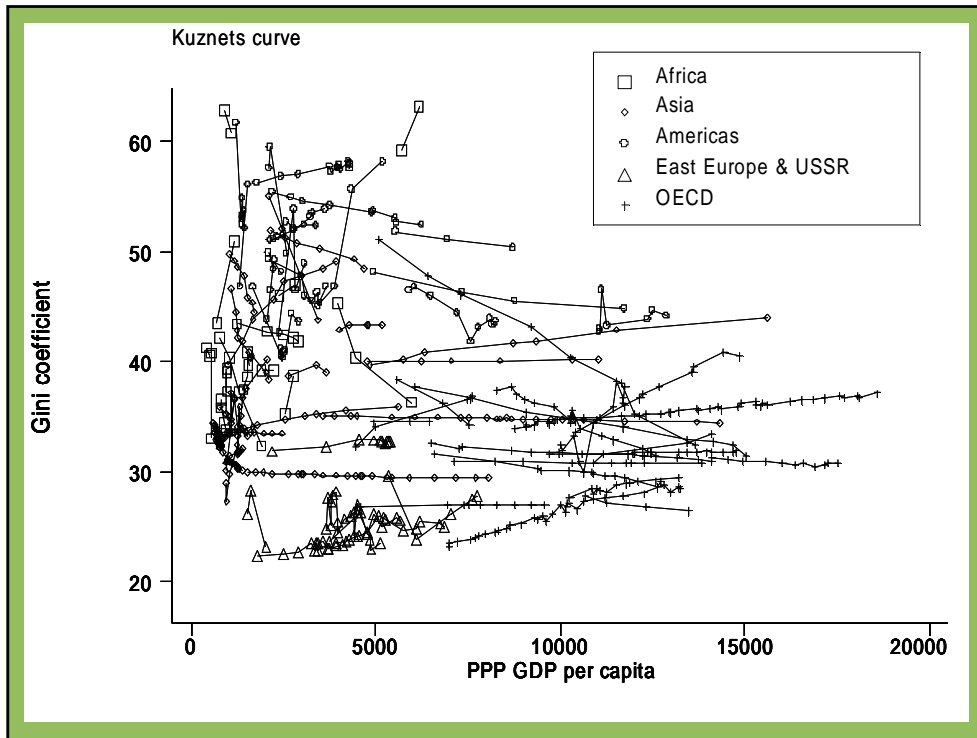
- Central planning → markets
- 3<sup>rd</sup> fastest growth in world

Consequences for inequality?

## Two Surprising Inequality Patterns

- Inequality stable in most countries, high or low
- Rapid growth  $\square$   
equally rapid income growth for poor





## Does Vietnam fit these patterns?

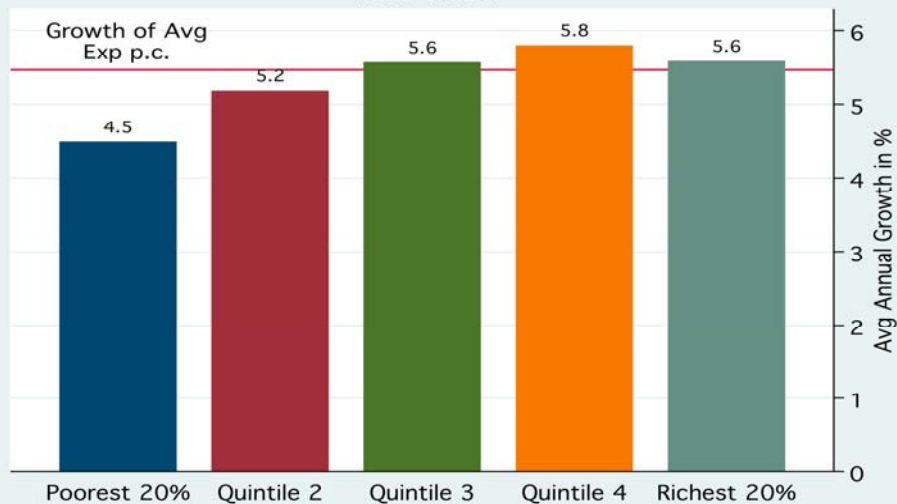
Relatively equal distribution in 1990

- Land reform in north, 1956
- Collectivization of ag in South, 1975

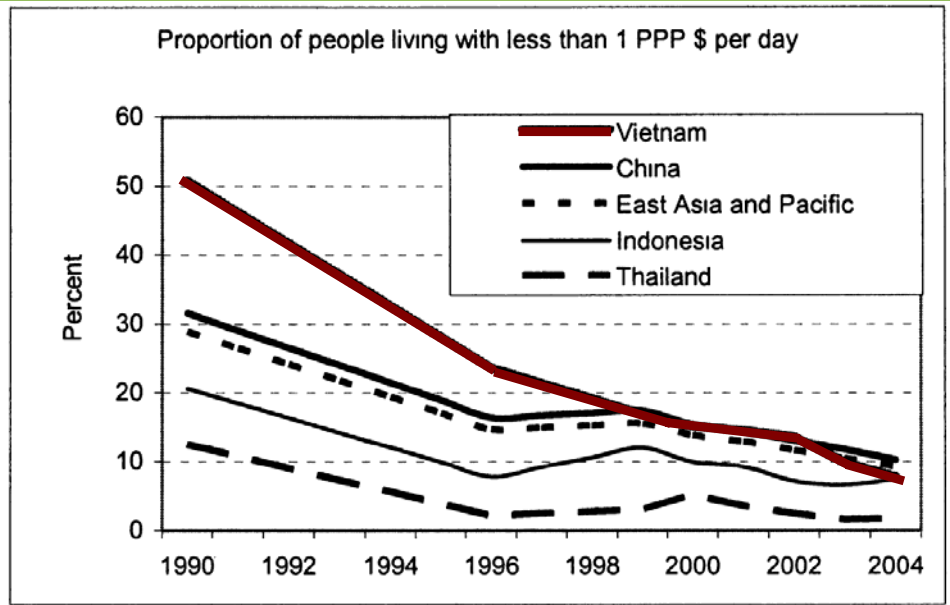
China vs. South Korea  
Russia                  Taiwan

## Poor Grew Slower in Vietnam

Expenditure per Capita Growth by Quintile  
1993-2006



## Fall of absolute poverty in Vietnam



## Income Inequality Statistics

Two measurement problems

- Measurement errors
- Transitory income

□ Biased estimates of inequality

## Measurement Error in Income

$$y = y^* + e$$

$y$  - observed income

$y^*$  - actual income

$e$  - measurement error

$y^*$  has mean  $\mu_{y^*}$  & variance  $\sigma_{y^*}^2$

$e$  has mean 0 & variance  $\sigma_e^2$

## Biased Inequality Statistics

Average observed income,  $\bar{y}$ , is unbiased estimate of  $\mu_{y^*}$

$$E \bar{y} = \mu_{y^*}$$

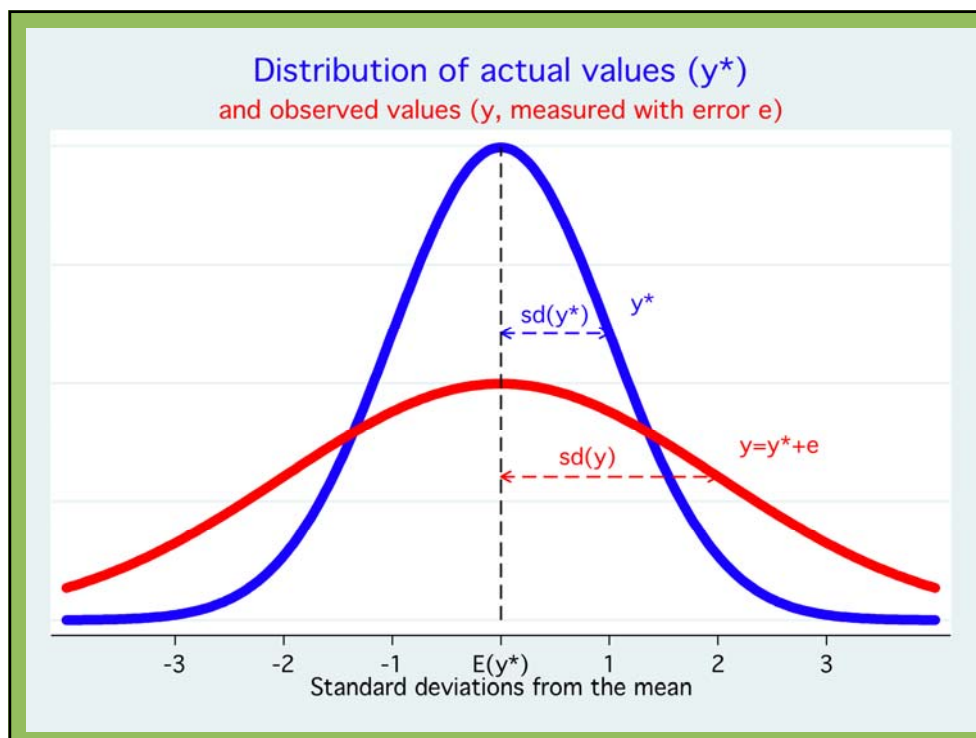
Sample variance,  $s_y^2$ , is biased estimate of  $\sigma_{y^*}^2$

$$s_y^2 = \sigma_{y^*}^2 + \frac{p}{n} \sigma_e^2$$

## Biased Inequality Statistics

Inequality index ( $I_2$ ) is biased and inconsistent.

$$I_2 = \frac{s_y^2}{y^2}$$



## Estimated inequality is biased

Average observed income,  $\bar{y}$ , is an unbiased estimate of the mean of actual income,  $y^*$

$$E \bar{y} = y^*$$

The sample variance of observed income,  $s_y^2$ , is a biased and inconsistent estimate of the variance of  $y^*$ ,

$$s_y^2 = \frac{1}{n} \sum (y_i - \bar{y})^2 = \frac{1}{n} \sum (y_i^* - \bar{y} + e_i)^2$$

$$I_2 = \frac{s_y^2}{y^{*2}}$$

## Permanent vs. Transitory Income

$$y = y_P + y_T$$

$y$  - income

$y_P$  - permanent income

$y_T$  - transitory income, mean=0

Measure distribution of

$$y_P = y - y_T$$



## Relationship to Consumption

Lifetime budget constraint:

$$\Sigma \text{ consumption} = \Sigma \text{ income}$$

- smooth consumption over time

Robust hypothesis:

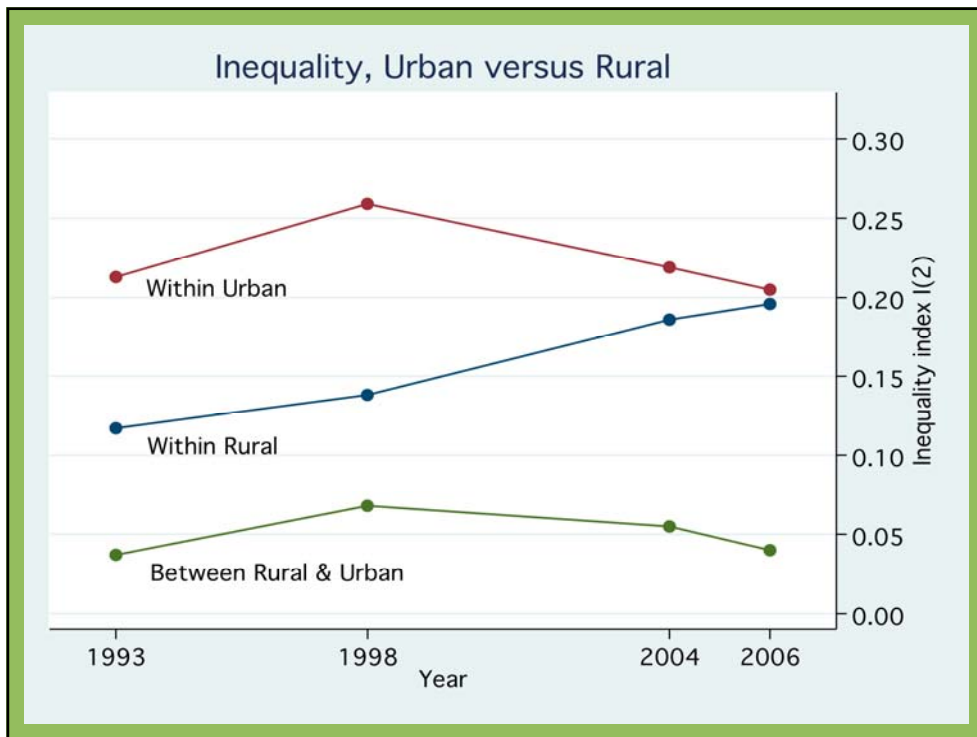
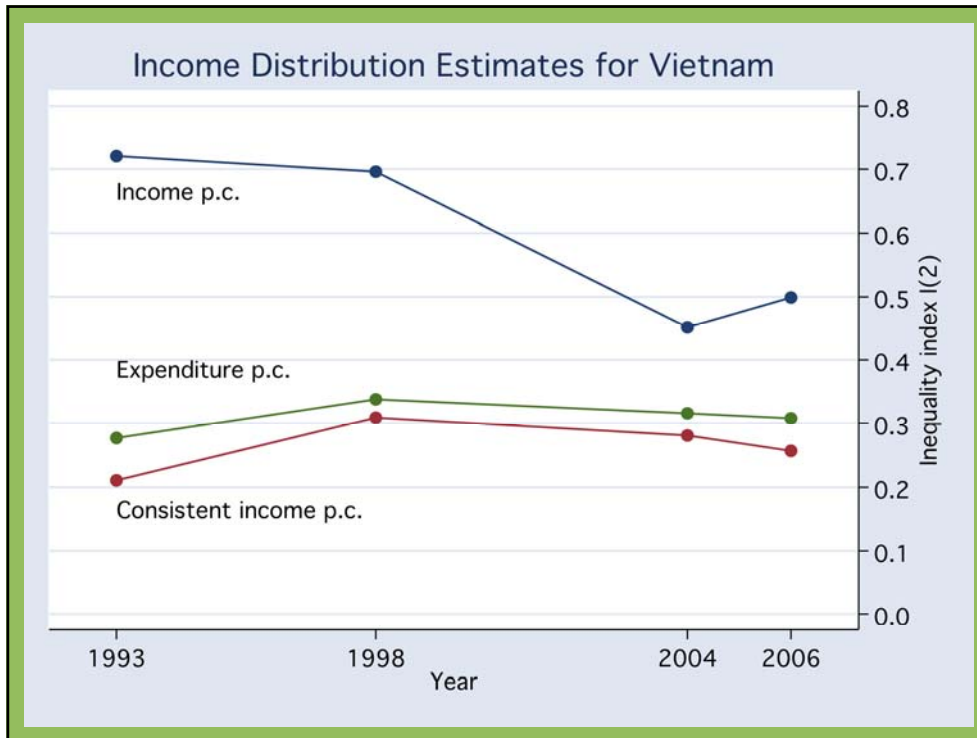
consumption = share of permanent income

$$c = \theta y_P$$

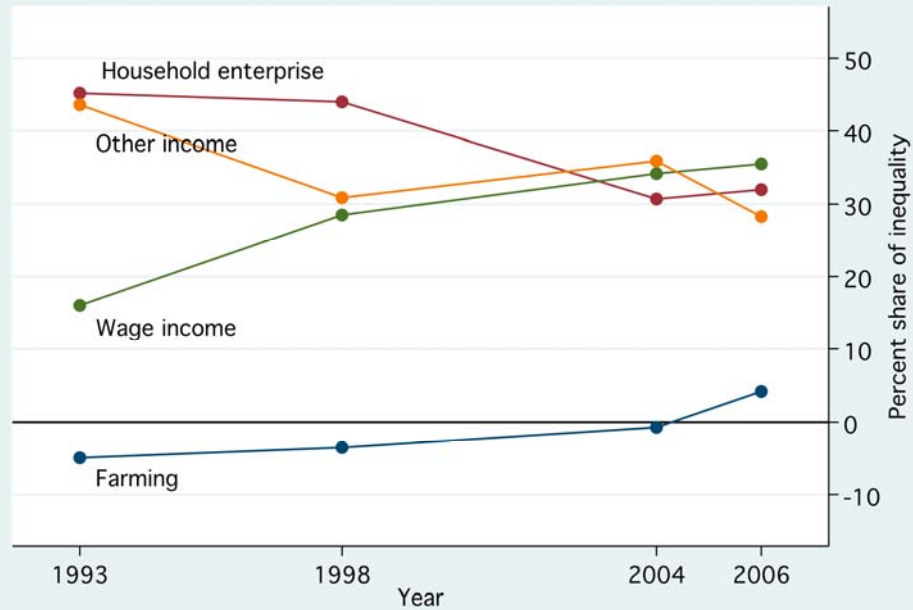
## Instrumented $I_2$ is consistent

$$s_{yc}^p = \frac{2}{1}$$

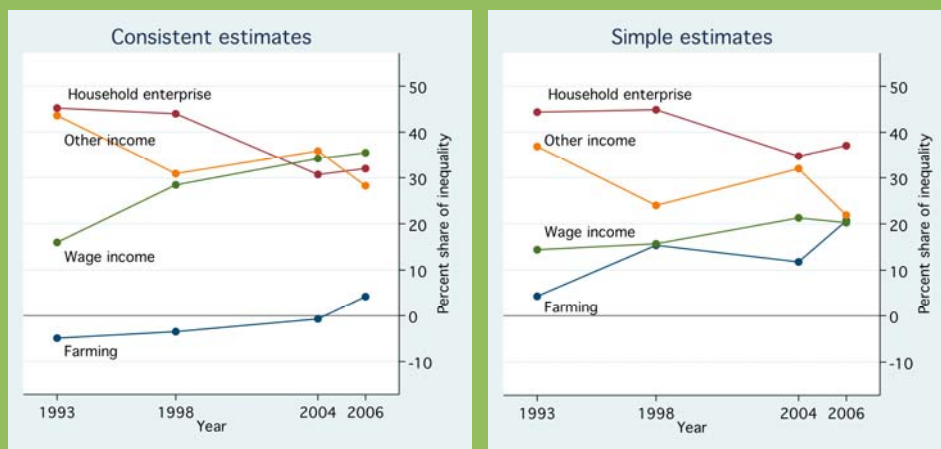
$$plim I_2 = plim \frac{s_{yc}}{yc} = \frac{2}{2}$$



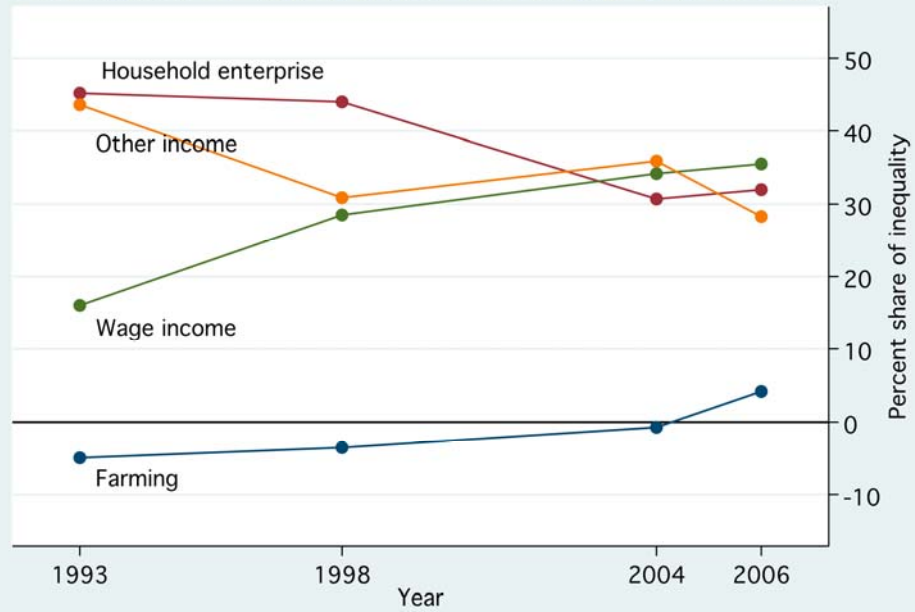
### Contribution of income sources to inequality in Vietnam



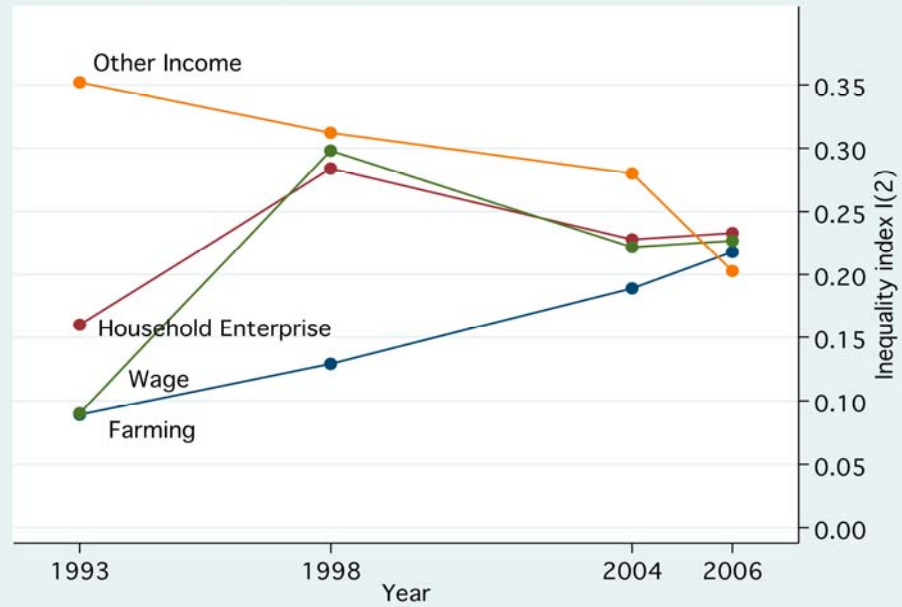
### Accuracy of source of income inequality estimates

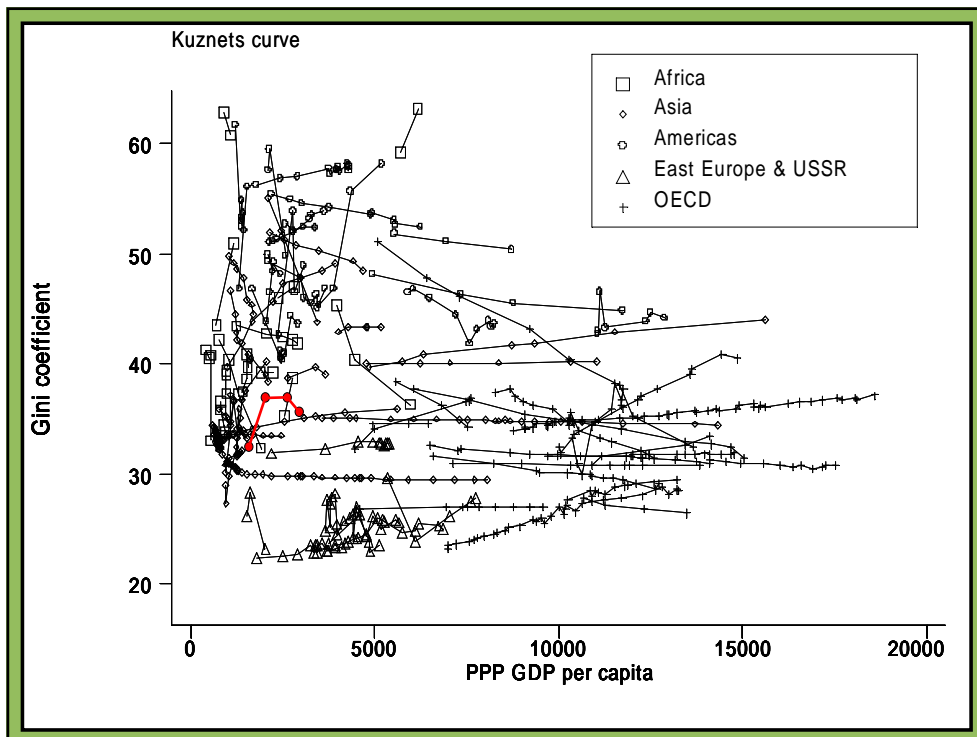
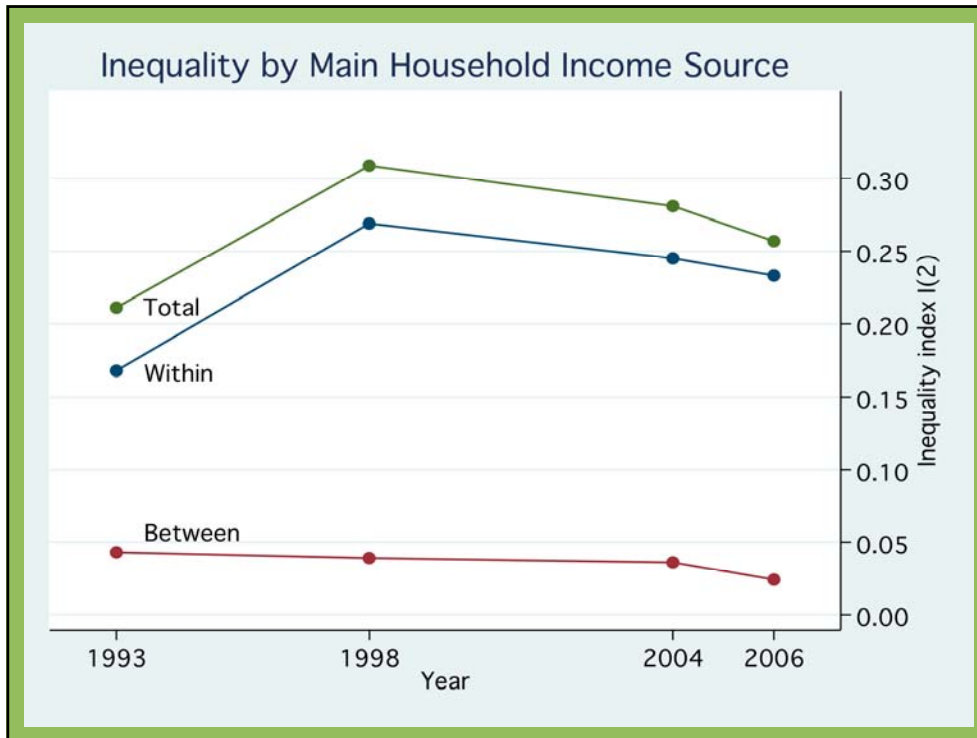


Contribution of income sources to inequality in Vietnam



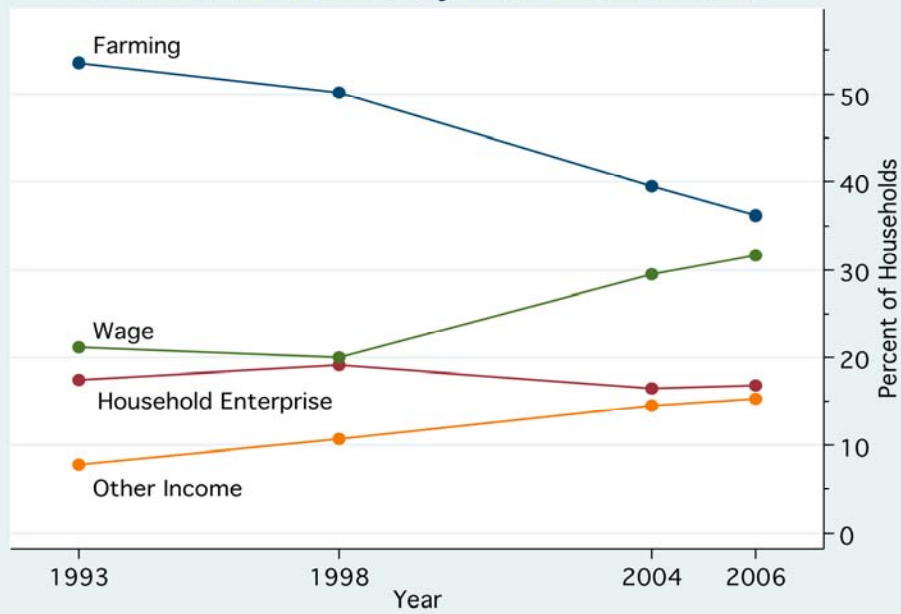
Inequality by Main Household Income Source







Percent of Households by Main Income Source



Main Income Source as Share of Total Income

