Social Insurance in Developing Economies

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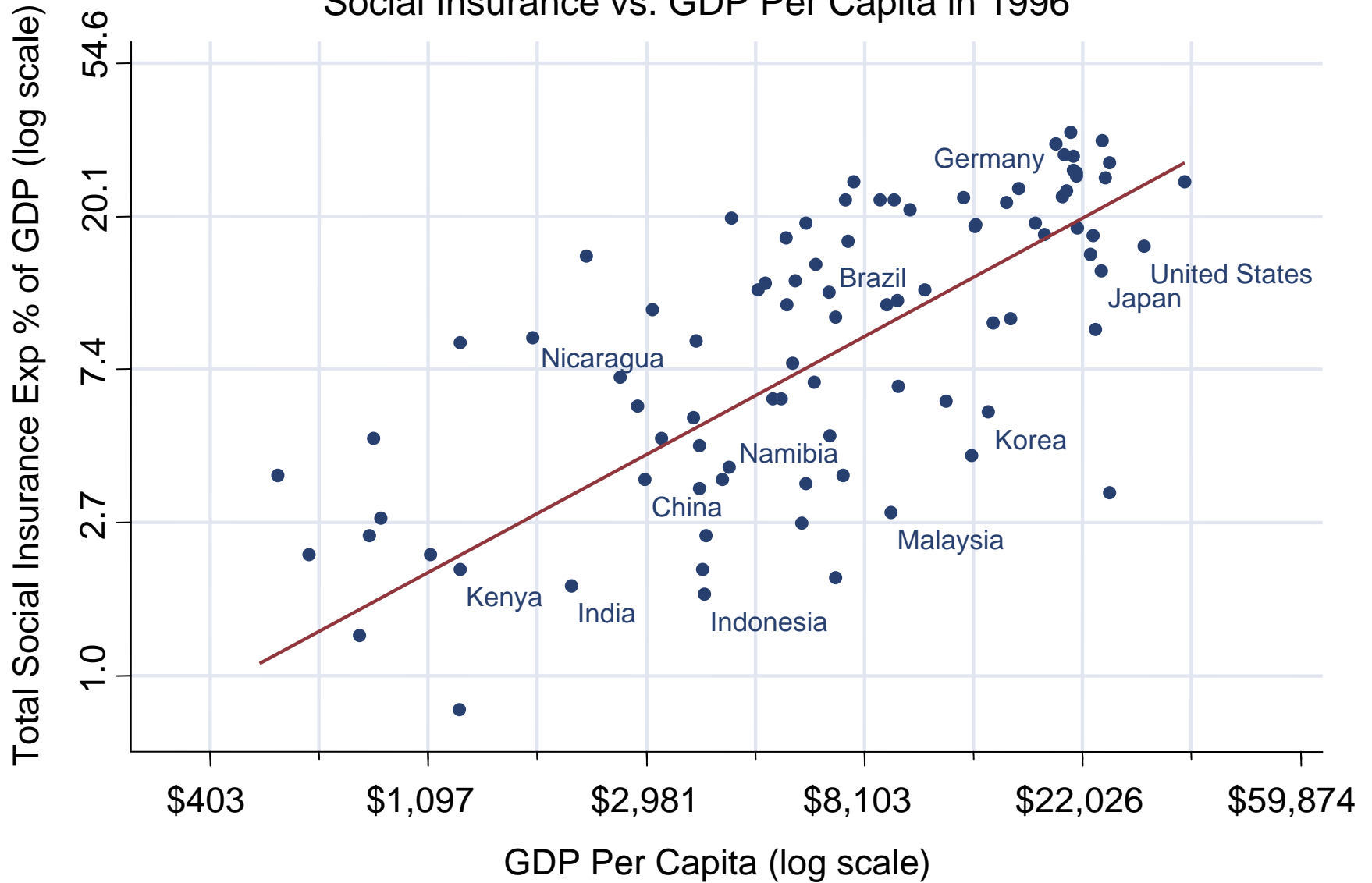
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Motivation

- Government-provided social safety nets in developing countries are much smaller than in developed economies
    - Definition: Social security, disability, unemployment, work injury, health
    - Below-median per capita income countries: 6.8% of GDP in 1996
    - Above-median: 18.5% of GDP

Figure 1
Social Insurance vs. GDP Per Capita in 1996

Scatter plot with y-axis "Total Social Insurance Exp % of GDP (log scale)" with gridlines at 1.0, 2.7, 7.4, 20.1, 54.6, and x-axis "GDP Per Capita (log scale)" with gridlines at $403, $1,097, $2,981, $8,103, $22,026, $59,874. Labeled data points include: Germany, United States, Japan, Brazil, Nicaragua, Korea, Namibia, China, Malaysia, Kenya, India, Indonesia.

Motivation

- Yet shocks are equally or more prevalent in low income countries
    - 15% of Indonesian households report some shock in each year
    - Recent large-scale catastrophes in East Asia

- Important public finance question: What are the welfare consequences of implementing social insurance (SI) in developing economies?

- One strand of the literature (Townsend) in development focuses on **consumption drop** as a measure of value of insurance

- Many studies find small consumption drops, though results are disputed and some groups exhibit larger drops

- Nonetheless, a common view is that if consumption drop is small then insurance must have limited value

Overview of This Paper

- We question whether evidence on consumption fluctuations can be directly used to measure value of insurance

- Draw on normative tools from public finance literature to show that the value of insurance could be high despite limited cons. volatility

- Basic idea is that agents may use inefficient smoothing mechanisms, which would be used less with insurance

  - This point has been made qualitatively in several existing studies (Rosenzweig, Morduch, Holzmann, etc.)

- Our contribution is to formalize this point in a simple but general framework for optimal social insurance

  - Sheds light on how evidence on consumption smoothing and coping mechanisms can be combined to assess optimal design of insurance

Outline of Talk

1. Existing tests for adequacy of private insurance

2. Empirical comparison of consumption-smoothing in Indonesia and the U.S.

3. Normative framework: The importance of risk aversion

4. Estimates of risk aversion for households in low-income economies

5. Conclusion

Tests of Full Insurance

- Social insurance can only be beneficial in private insurance markets are incomplete

- Natural first test: Examine effect of shocks on consumption

  - If fall is small, private markets must be "adequate"

  - This "consumption-smoothing" test has been implemented by Townsend (1994) and many others in development literature

- Our objective: Identify relative marginal value of SI in developed vs. developing economies

  - Begin by comparing effects of a standard shock (unemployment) in U.S. and Indonesia on consumption

Data

- Panel Study of Income Dynamics (PSID)
  - Annual data from 1980 to 1993 for 8,000 U.S. households

- Indonesian Family Life Survey (IFLS)
  - Three interviews (1993, 1997, and 2000) for 7,500 Indonesian households

- We select households where head was employed at previous interview
  - One year before the current interview in the PSID
  - Three or four years in the IFLS

- Large differences between samples:

	PSID	IFLS
Income	$32,000	$1,484
Food cons	$7,255	$926

Estimation strategy

- Examine growth rates of consumption:

$$g_{it} = \log\left(c_{it}\right) - \log\left(c_{it\text{-}1}\right)$$

- Compare g_{it} for job losers with job keepers

- Begin with graphical nonparametric analysis to assess effects of unemployment shocks visually

- Augment graphical evidence with regressions to evaluate robustness of results to controls, sample selection

Figure 2

Effect of Unemployment on Consumption Growth in the US

Annual Growth Rate of Household Consumption

Year Relative to Job Loss
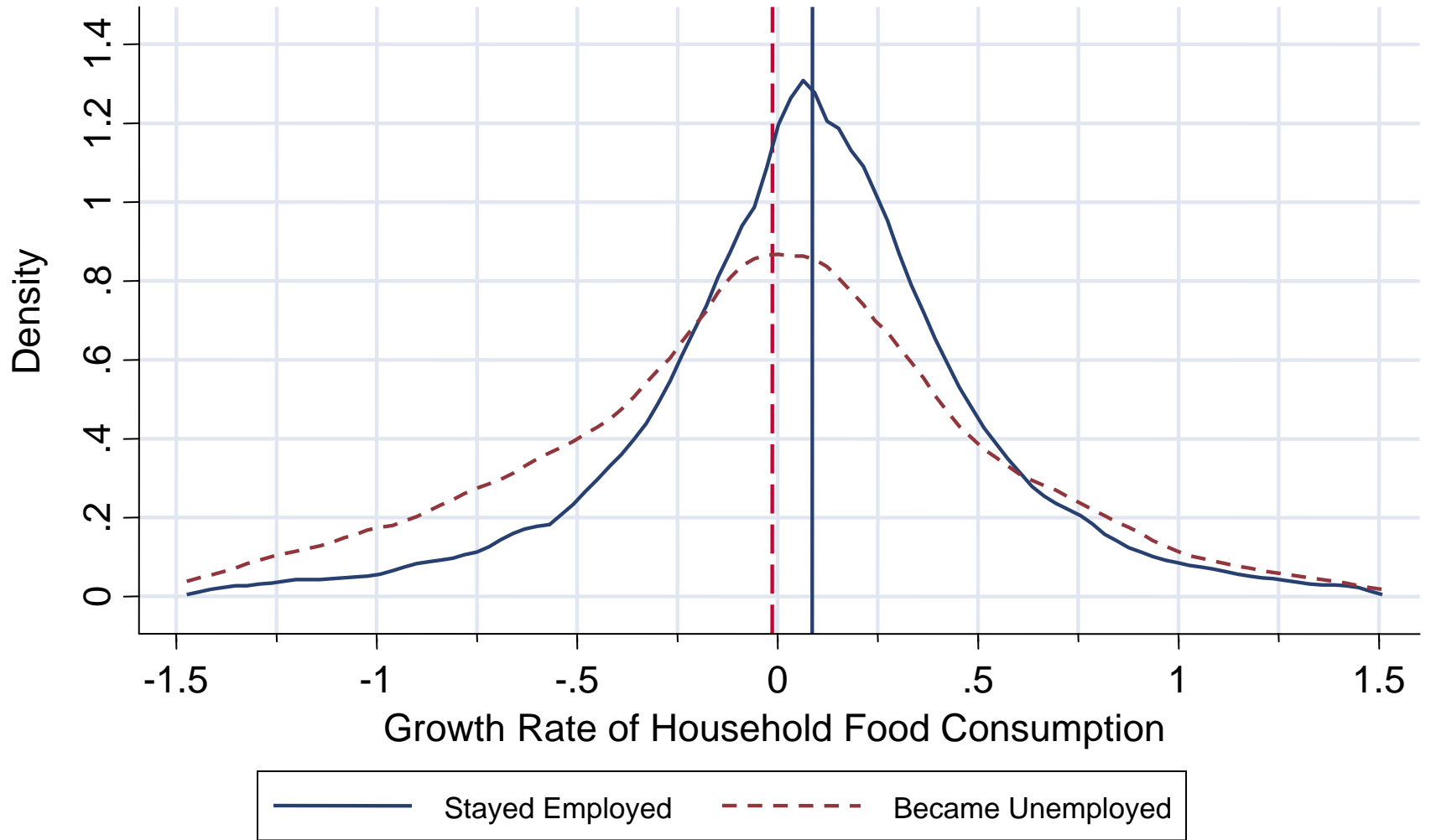
Source: PSID 1980-1993

Figure 3a

Effect of Unemployment on Food Consumption in Indonesia

Source: IFLS 1993-2000

Figure 3b

Effect of Unemployment on Food Consumption in the US

Source: PSID 1980-1993

Regression Analysis

- Examine robustness of these results by estimating variants of:

$$g_{it} = \alpha + \beta \mathrm{unemp}_{it} + X_{it}\theta + \varepsilon_{it}$$

where

g_{it} = consumption growth rate

unemp_{it} = unemployment indicator

X_{it} = other family characteristics

- Covariates control for differential consumption growth rates by group

- Also consider alternative sample selection
  - Restrict sample to households experiencing unemployment at some point in panel

- Additional checks: sensitivity to outliers, quantile regressions, broader definitions of consumption

Table 3
EFFECT OF UNEMPLOYMENT ON FOOD CONSUMPTION

Dependent variable: Food cons. growth rate (change in log food consumption)

	Full sample		Unemployed Exactly Once	
	US	Indonesia	US	Indonesia
Unemployed dummy	**-0.106**	**-0.078**	**-0.095**	**-0.098**
	(0.010)***	(0.022)***	(0.017)***	(0.038)**
Demographics	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Province/state dummies	Yes	Yes	Yes	Yes
Observations	50763	11284	7894	1231

Evidence for Adequacy of Insurance?

- Unemployment leads to 10% consumption drop in both countries

  - Surprising given U.S. has large UI system; Indonesia has none

- Earlier empirical studies (e.g. Townsend 1993) found similar results

- Some economists concluded that private insurance (via families, villages, etc.) is sufficient in developing economies

- Morduch (1995) survey:

  "The emerging consensus of the empirical literature [on consumption-smoothing in developing economies] is that holes in effective [consumption] insurance exist.... But, in general, the holes are a good deal smaller than many had assumed. **The results have clear policy implications**. If markets and alternative mechanisms do indeed provide reasonably good insurance and credit, publicly provided financial services and social security could crowd out private efforts with limited net gain to society."

- Some subsequent studies find larger drops than Townsend using refined methods (e.g. Ravallion and Chaudhari 1997),

  - Particularly for certain groups such as the poorest households

- Nonetheless, there appear to be situations where consumption fluctuations in low-income economies are not very large

- Does this mean that insurance is not valuable in these situations?

Normative Framework

- Examine this conclusion using some tools from public finance

- Chetty (2005) analyzes a general dynamic model with arbitrary choice variables and constraints, and shows that marginal value of social insurance is given by

$$\gamma \Delta c/c$$

where

γ = *coefficient of relative risk aversion*

$\Delta c/c$ = consumption drop during unemployment

- Intuition: value of transferring a dollar from good state to bad state depends on difference in marginal utilities, which is approximately cons drop times curvature.

- Shows that *$\Delta c/c$* itself inadequate to compute welfare gains from SI

A Stylized Example

- One period model, two states (employed and unemp), no savings

- Utility over consumption: $u(c) = c^{1-\gamma}/(1-\gamma)$

- Disutility of earning consumption in a given state: $\phi(c) = \theta c$

- Unemployment modeled as a rise in θ (harder to earn money)

- Normalize $\theta = 1$ in employed state

- Agents maximize utility to choose c in each state:

$$c_e = 1 \quad \text{and} \quad c_u = (1/\theta^u)^{1/\gamma}$$

- Consumption drop is given by

$$\Delta c/c = 1-(1/\theta^{u})^{1/\gamma}$$

- Note that $\Delta c/c$ positively related to θ^{u} and negatively related to γ

- Hence $\Delta c/c$ could be small for two reasons:

  - θ^{u} low → easy to insure fluctuations privately; not much gain likely from SI

  - γ high → agents very averse to reducing consumption, so maintain smooth path by costly actions in unemployed state. Here, SI could have large welfare benefits.

- Critical to determine which reason is correct to make policy statements

Table 4
WELFARE GAINS OF SOCIAL INSURANCE

A. Consumption Drop ($\Delta c/c$)

		Coefficient of relative risk aversion (γ)
		1	2	3	4	5
	1	0.00	0.00	0.00	0.00	0.00
Disutility of	1.25	0.20	**0.11**	0.07	0.05	0.04
effort in unemp.	1.5	0.33	0.18	**0.13**	0.10	0.08
state (θ_u)	1.75	0.43	0.24	0.17	**0.13**	0.11
	2	0.50	0.29	0.21	0.16	**0.13**

B. Marginal Welfare Gain ($\gamma\Delta c/c$)

		1	2	3	4	5
	1	0.00	0.00	0.00	0.00	0.00
Disutility of	1.25	0.20	**0.21**	0.22	0.22	0.22
effort in unemp.	1.5	0.33	0.37	**0.38**	0.39	0.39
state (θ_u)	1.75	0.43	0.49	0.51	**0.52**	0.53
	2	0.50	0.59	0.62	0.64	**0.65**

Risk Aversion in Developing Economies

- Key question: Is consumption smooth in developing countries because of adequate insurance markets or because γ is high?

- Simplest indicators that risk aversion may be high:
  - Many households live near subsistence levels
    - 70 percent of consumption budget devoted to food in IFLS
    - Consumption of staples falls sharply, especially for non-farmers

- Additional evidence that γ is large: Costly smoothing (high θ)
  - Many existing studies; particularly striking is Miguel (2005)
  - We look at schooling expenditures and spousal labor supply
    - If agents resort to such costly mechanisms to maintain c, γ must be quite high

- Additional evidence that γ is large: Households rely on costly (high θ) smoothing methods

  - Many existing studies: less risky but less profitable farming, etc.

  - Particularly provocative evidence from Miguel (2005) on witches

- We complement these studies by examining response of schooling expenditures and spousal labor supply to unemployment shocks

  - Note that these do not vary with unemployment in US

- If agents resort to such costly mechanisms to maintain c, γ must be quite high

- Insurance could have high value here despite small cons drop

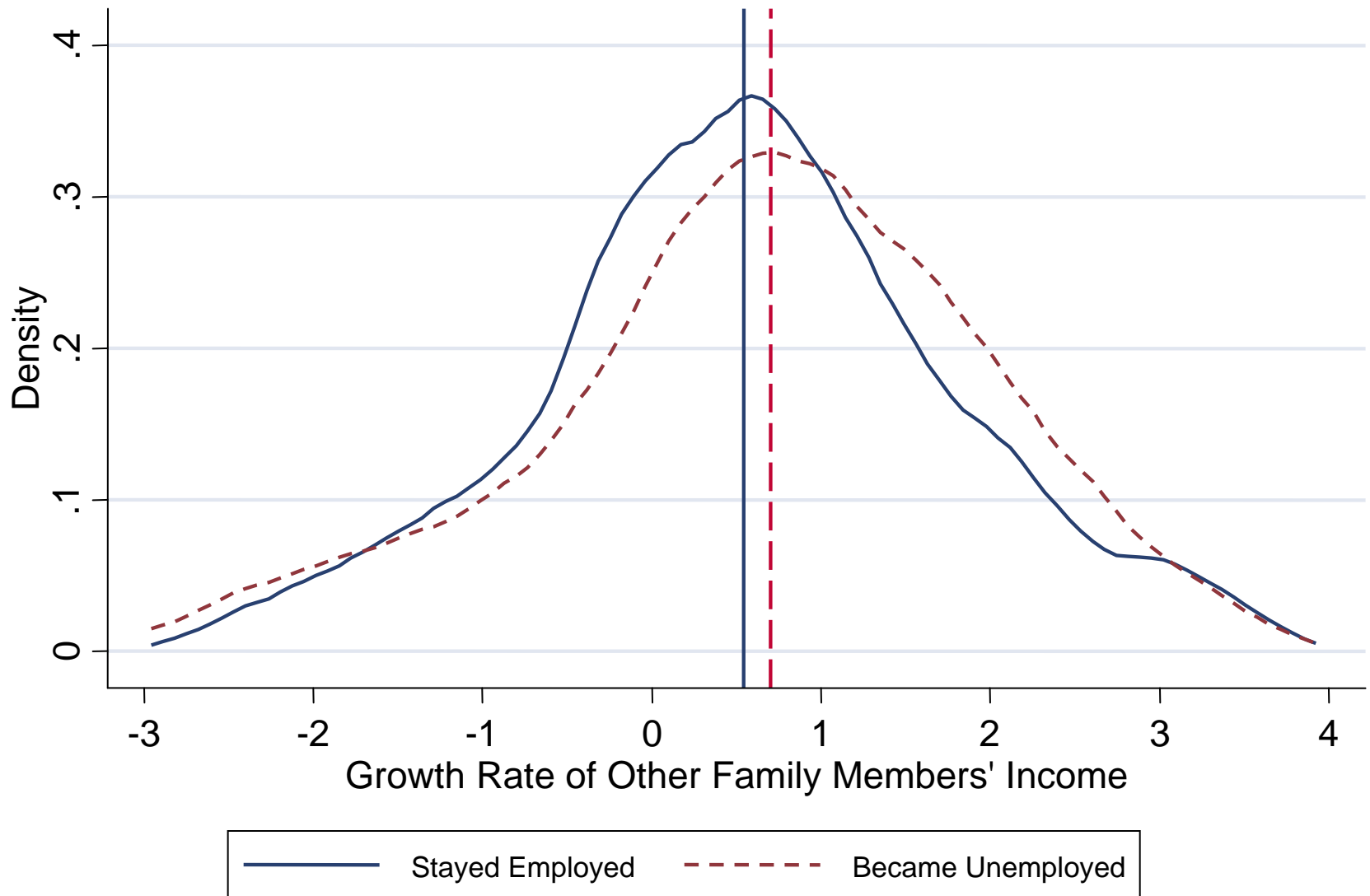 - Would not have to resort to use of inefficient smoothing methods

Figure 4

Effect of Unemployment on Education (Intensive Margin)
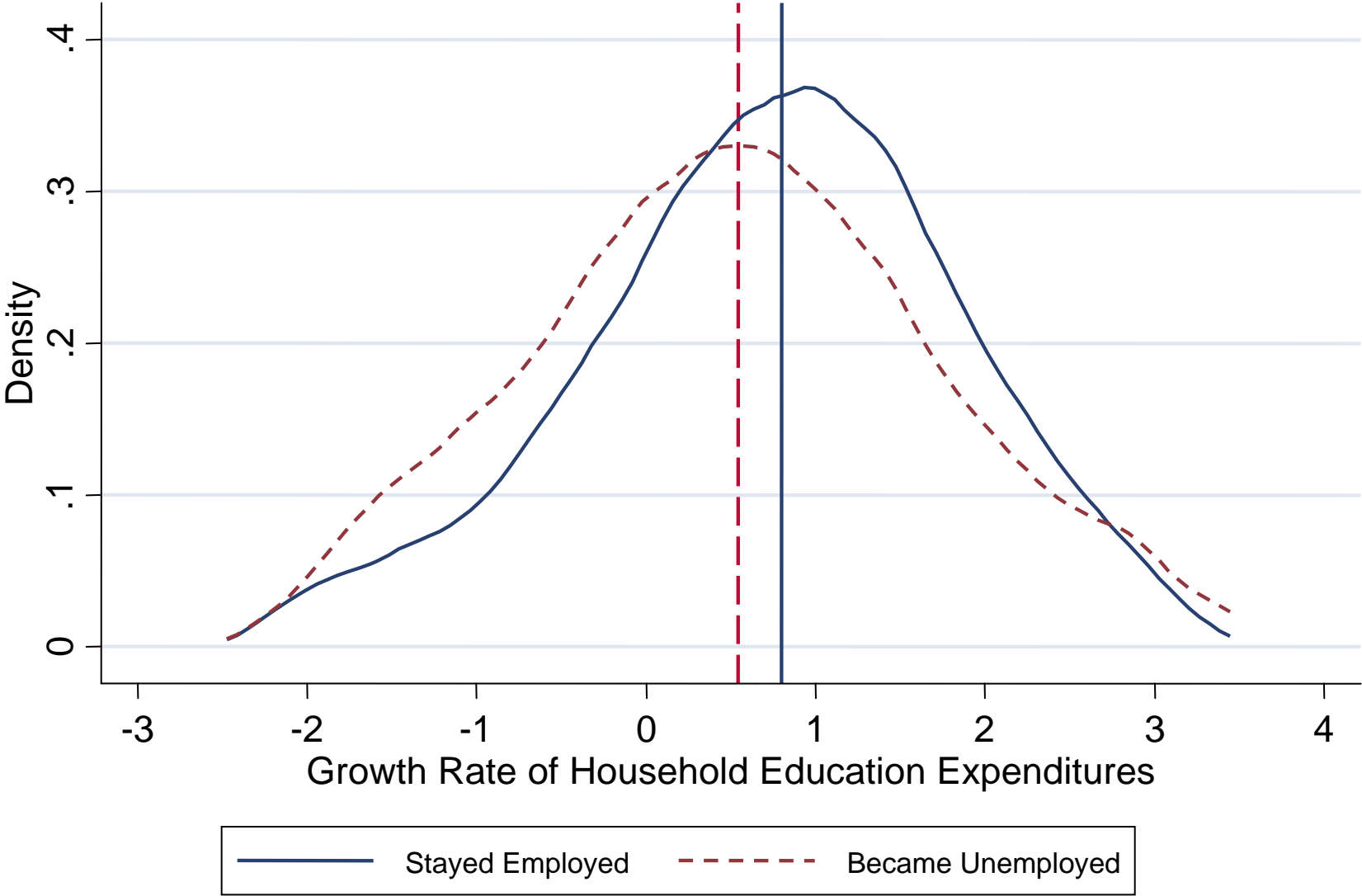
Source: IFLS 1993-2000

Figure 5
Effect of Unemployment on Others' Labor Supply (Intensive Margin)

Legend: Stayed Employed --- Became Unemployed

Source: IFLS 1993-2000

Table 6
OTHER RESPONSES TO UNEMPLOYMENT:
EVIDENCE OF RISK AVERSION

	Educational expenditures		Other fam. members' labor	
	Extensive Margin	Intensive Margin	Extensive Margin	Intensive Margin
Dependent Variable:	Educ dummy	Median log Δ ed exp	Partic dummy	Median log Δ other fam inc
Unemployed dummy	**-0.09**	**-0.12**	**0.15**	**0.11**
	(0.02)***	(0.07)	(0.02)***	(0.07)*
Demographics	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes
Observations	7,457	6,156	6,407	3,478

Conclusions

- Consumption fluctuations not particularly large in low-income economies

- Normative analysis of social insurance shows that this observation is insufficient to make policy statements

- Need to determine whether consumption drop is small because insurance markets are good or because risk aversion is high

- Plausible that risk aversion is quite high in low-income economies

- If provision of SI helps in smoothing consumption, these programs could yield large welfare gains

  - Considerable evidence that SI does smooth consumption in developed economies, but no evidence yet for developing countries.

Conclusions

- However, important to remember that SI may also have very large moral hazard efficiency costs in developing economies

  - Firms' incentives are a serious concern, particularly if system is poorly designed so that market forces are hampered

  - Some situations, however, might involve limit moral hazard (e.g. rainfall-based system for droughts)

- Main lesson: Further PF research on SI in developing economies likely to be very valuable, since potential gains from a carefully designed system could be large.

  - This agenda is particularly topical since some developing economies are reaching a stage where implementation of large-scale SI is feasible