Impact of Universal Health Coverage Scheme (UCS) on Household's Precautionary Savings in Thailand

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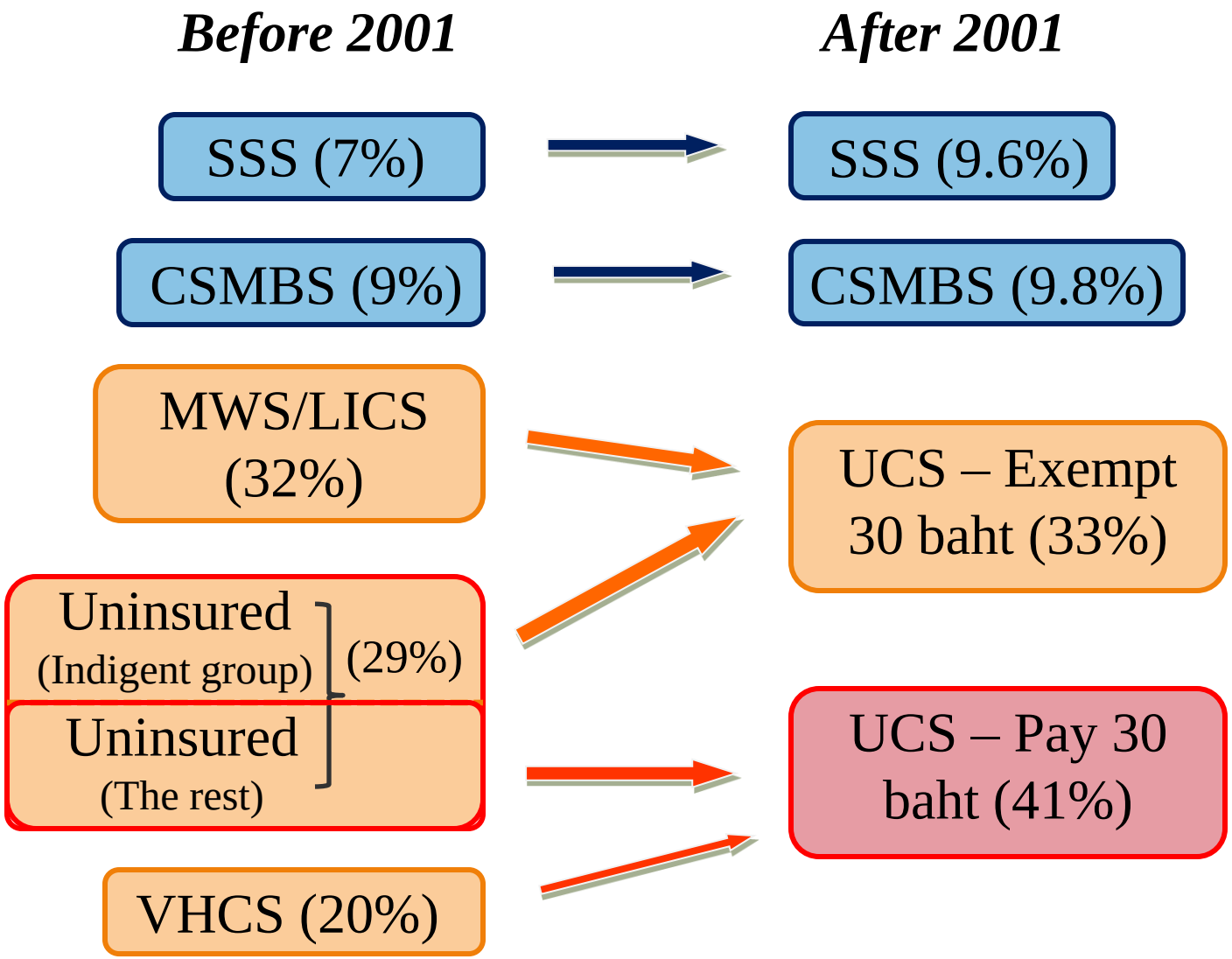
Outline

- Motivation and background
- Research question
- Literature review
- Theoretical model
- Data, empirical strategy, and results
- Conclusion and discussion

Motivation

- Public health insurance programs in developing countries:
  - Compulsory insurance, fringe benefits, or welfare schemes
  - Economic arguments: efficiency & equity
- Expected benefits of public health insurance
  - Improve population's health outcomes
  - Provide financial protection
- Little is known about the *causal* impact of the UC Scheme on household consumption and savings behavior.

Thailand's Health Care Reform in 2001



Thailand's Universal Coverage Scheme

- Main features:
  - Cover >70% of population
  - Financed by general tax revenue
  - 30 baht co-payment per visit, with some exceptions (eliminated in 2007)
  - Beneficiaries need to seek care at their registered UC facilities (primary care units)

Research Question

- Research question:
  - What is the *causal* impact of UCS on households' precautionary savings in Thailand?
- Contributions:
  - Analysis of UCS impact in a dynamic framework with uncertainty
  - Understanding the role of UCS as a formal financial protection mechanism against health risk, as opposed to *self-insurance* (e.g. precautionary savings)
  - Implications for income redistribution and welfare gain among UCS beneficiaries

Literature (1)

- Model of health insurance and savings for health expenditure
  - Kotlikoff (1989), Deaton (1992), Chou et al (2003), and Kong et al (2009)
- Precautionary savings and risk reduction
  - Private health insurance (Kimball, 1990; Starr-McClure, 1996; Guariglia & Rossi, 2004)
  - Public health insurance (Kotlikoff,1989; Gruber & Yelowitz, 1999; Maynard & Qiu, 2009)
- Taiwan's NHI (Chou et al., 2003; Chou et al., 2004)
  - NHI is the only health insurance scheme, and beneficiaries are free to choose any provider.

Literature (2)

- Thailand's UCS
  - Lower total expenditures due to lower medical expenditures (Na Ranong et al., 2005; Panpiemrat et al., 2007)
  - Higher total savings (NESDB, 2003)
  - None has addressed the *causal* impact of UCS on consumption and savings.

Theoretical Model (1)

- A stochastic life-cycle model (Deaton, 1992; Chou et al.,2003; Kong et al., 2008)

$$\max_{C_\tau, M_\tau} E_\tau \sum_{\tau=t}^{T} \beta^t \left[U(C_t, H_t) = -\frac{1}{\alpha} e^{-\alpha C_t} - \frac{1}{\gamma} e^{-\gamma H_t} \right]$$

Subject to:

$$A_{t+1} = (1 + r)(A_t + Y_t - M_t - C_t)$$

$$Y_t = \omega H_t$$

$$H_{t+1} = (1 - \delta) H_t + \lambda M_t + \eta_{t+1}$$

$$A_{T+1} = 0$$

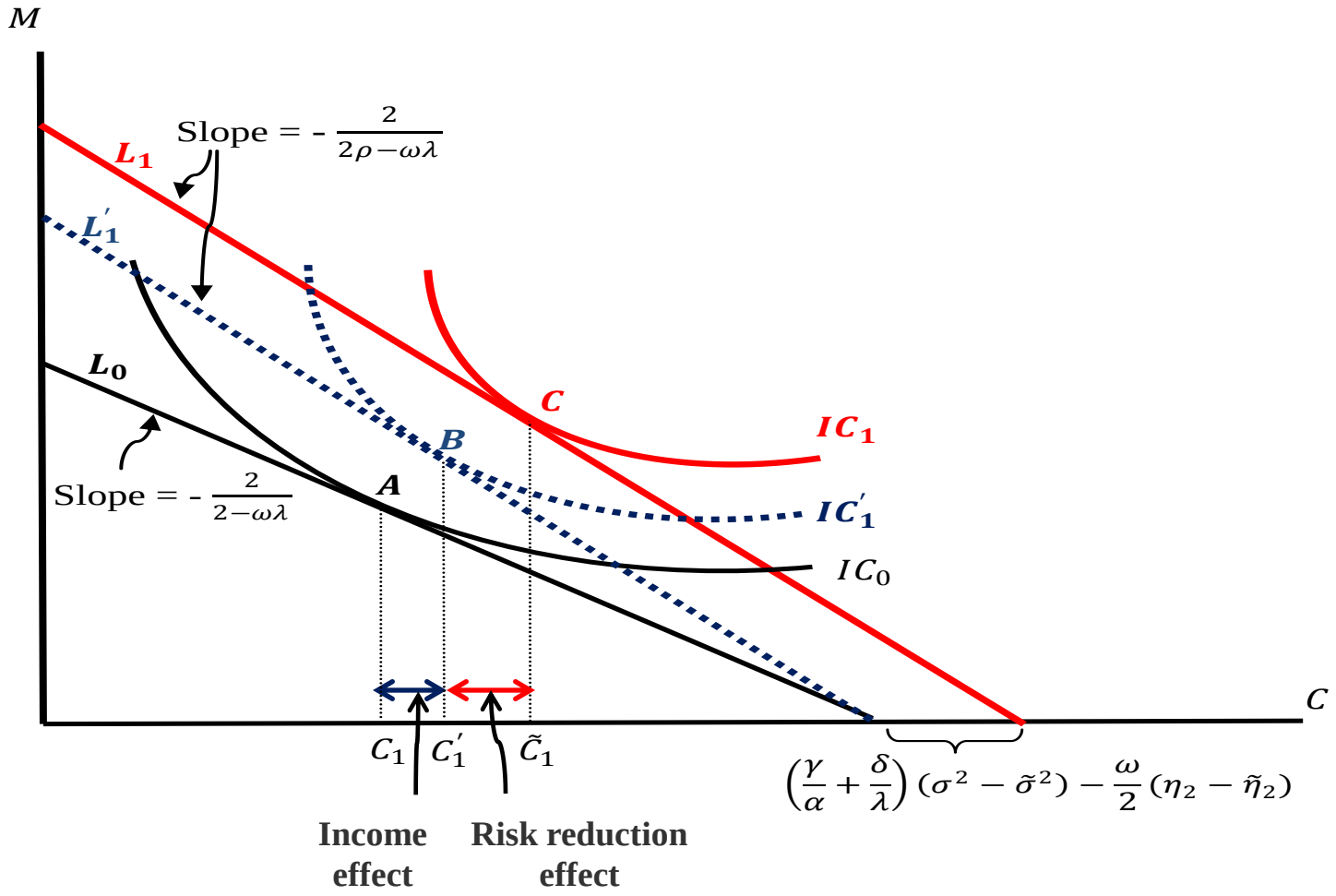
Optimal current consumption level (T=2):

$$C_1 = \frac{A - \Omega}{2} + \left(1 - \frac{\delta}{2}\right) Y_1 - \left(1 - \frac{\omega\lambda}{2}\right) M_1 - \left(\frac{\gamma}{\alpha} + \frac{\delta}{\lambda}\right) \frac{\gamma}{4} \sigma^2 + \frac{\omega\eta_2 - \varepsilon_2 - \xi_2}{2}$$

Theoretical Model (2)

Assume a subsidization reduces OOP expenditure to m_t $(m_t \leq M_t)$

$$\tilde{C}_1 - C_1 = \left(1 - \frac{\omega\lambda}{2}\right)(M_1 - m_1) + \left(\frac{\gamma}{\alpha} + \frac{\delta}{\lambda}\right)\frac{\gamma}{4}(\sigma^2 - \tilde{\sigma}^2) - \frac{\omega}{2}(\eta_2 - \tilde{\eta}_2)$$



Data

- Socio-Economic Surveys (SES) from 2001, 2004, & 2007
  - Variables of interest:
    - HH income and consumption expenditures (to compute saving)
    - Socio-economic characteristics
  - Sample sizes: 12,271 - 43,055 households
- Health and Welfare Surveys (HWS) from 2001, 2004, & 2007
  - Variable of interest: types of health insurance
  - Sample sizes vary from 19,914 to 62,167 households.

Data Issues

- The samples in HWS and SES are not the same for 2001 and 2004 data.
  - Infer health insurance information from HWS (Direct prediction method – McKenzie (2005))
- Type of health insurance is on an individual basis, but savings is measured at the household level.
  - Define a health insurance variable as proportion of household members who have a particular type of insurance
- SES and HWS are not panel data
  - Pseudo-panel based on head's age groups, employment status, group of provinces (Deaton, 1985)

Empirical Specifications (1)

- Difference-in-difference estimation: Use the variation in health insurance types
  - Treatment: UCP beneficiaries (previously uninsured)
  - Control : People whose health insurance did not change.
    - CSMBS, SSS, private health insurance
    - MWS in 2001 (UCE after 2001)
    - VHCS in 2001 (UCP after 2001)
- Dependent variables:
  - Total savings: absolute (log values), and ratio to income
  - Non-medical consumption: absolute (log values), and ratio to income

Empirical Specifications (2)

- Regression equation for pseudo-panel data (SSS is omitted):

$$\bar{Y}_{c,t} = \beta_0 + \beta' \bar{X}_{c,t} + \gamma T + \delta_1 \bar{G}_{c,t}^{csmbs} + \delta_2 \bar{G}_{c,t}^{priv} + \delta_3 \bar{G}_{c,t}^{mws/uce} + \delta_4 \bar{G}_{c,t}^{vhcs/ucp1} + \delta_5 \bar{G}_{c,t}^{unins/ucp2} + \rho_1 T.\bar{G}_{c,t}^{csmbs} + \rho_2 T.\bar{G}_{c,t}^{priv} + \rho_3 T.\bar{G}_{c,t}^{mws/uce} + \rho_4 T.\bar{G}_{c,t}^{vhcs/ucp1} + \rho_5 T.\bar{G}_{c,t}^{unins/ucp2} + \bar{a}_c + \bar{\varepsilon}_{c,t}$$

Where

- $\bar{Y}_{c,t}$ is average proportion of hh members having insurance type j among households in cohort c.
- $\bar{X}_{c,t}$ is average household characteristics.
- *T=1* after UC implementation (year=2004, 2007)
- $\bar{a}_c$ is cohort fixed effect.

Impact of the UCS (DID estimates)

- Example:
  - UCP (uninsured in 2001) is the treatment group.

$$\Delta_{treatment} = E\left[\bar{Y}_{c,1}^{ucp2}\right] - E\left[\bar{Y}_{c,0}^{unins}\right] = \gamma + \rho_5$$

  - SSS is the control group.

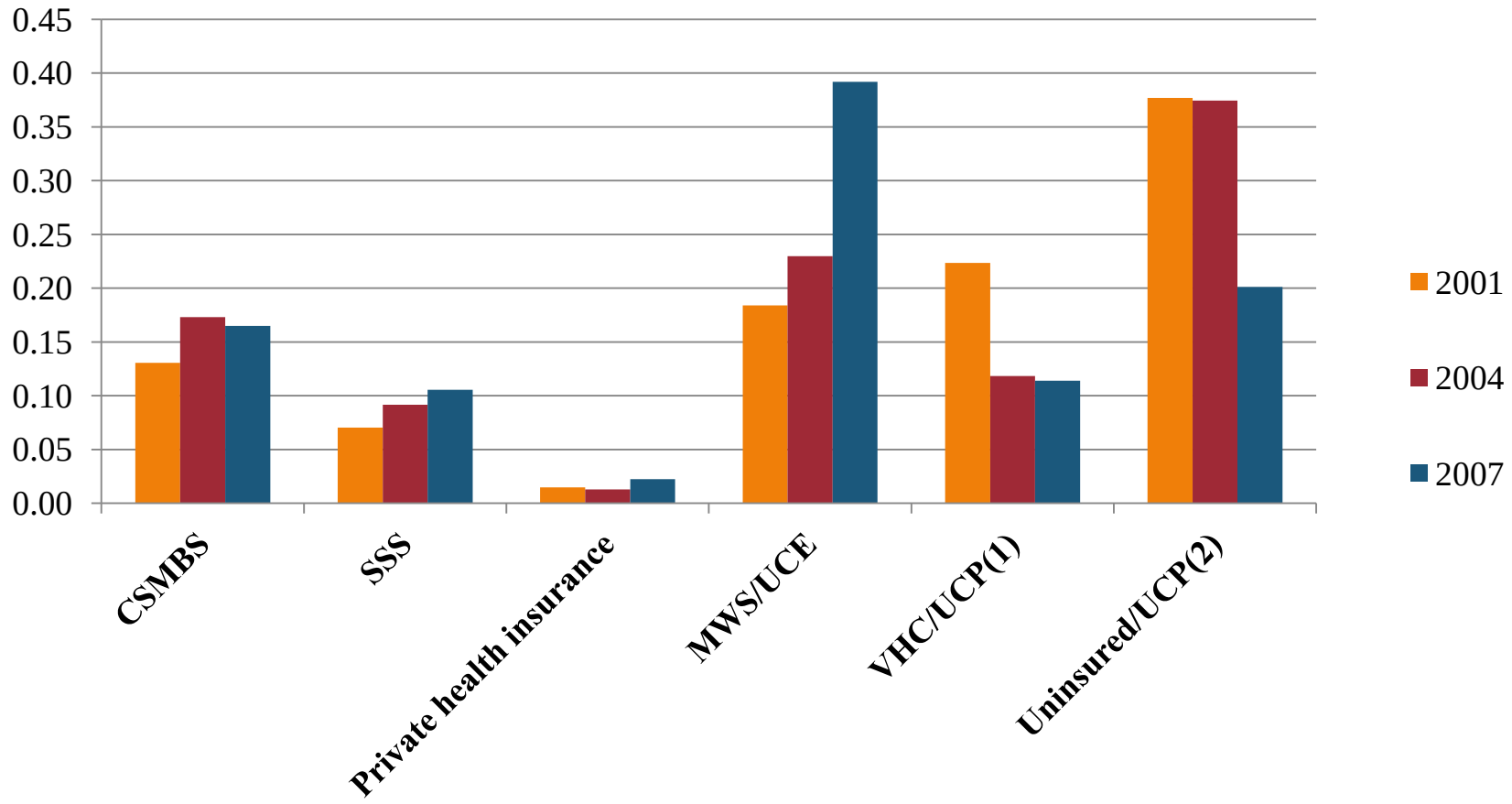
$$\Delta_{control} = E\left[\bar{Y}_{c,1}^{sss}\right] - E\left[\bar{Y}_{c,0}^{sss}\right] = \gamma$$

  - Difference-in-difference estimate:

$$\tau_{DID} = \Delta_{treatment} - \Delta_{control} = \rho_5$$

Cohorts Descriptive Statistics (1)

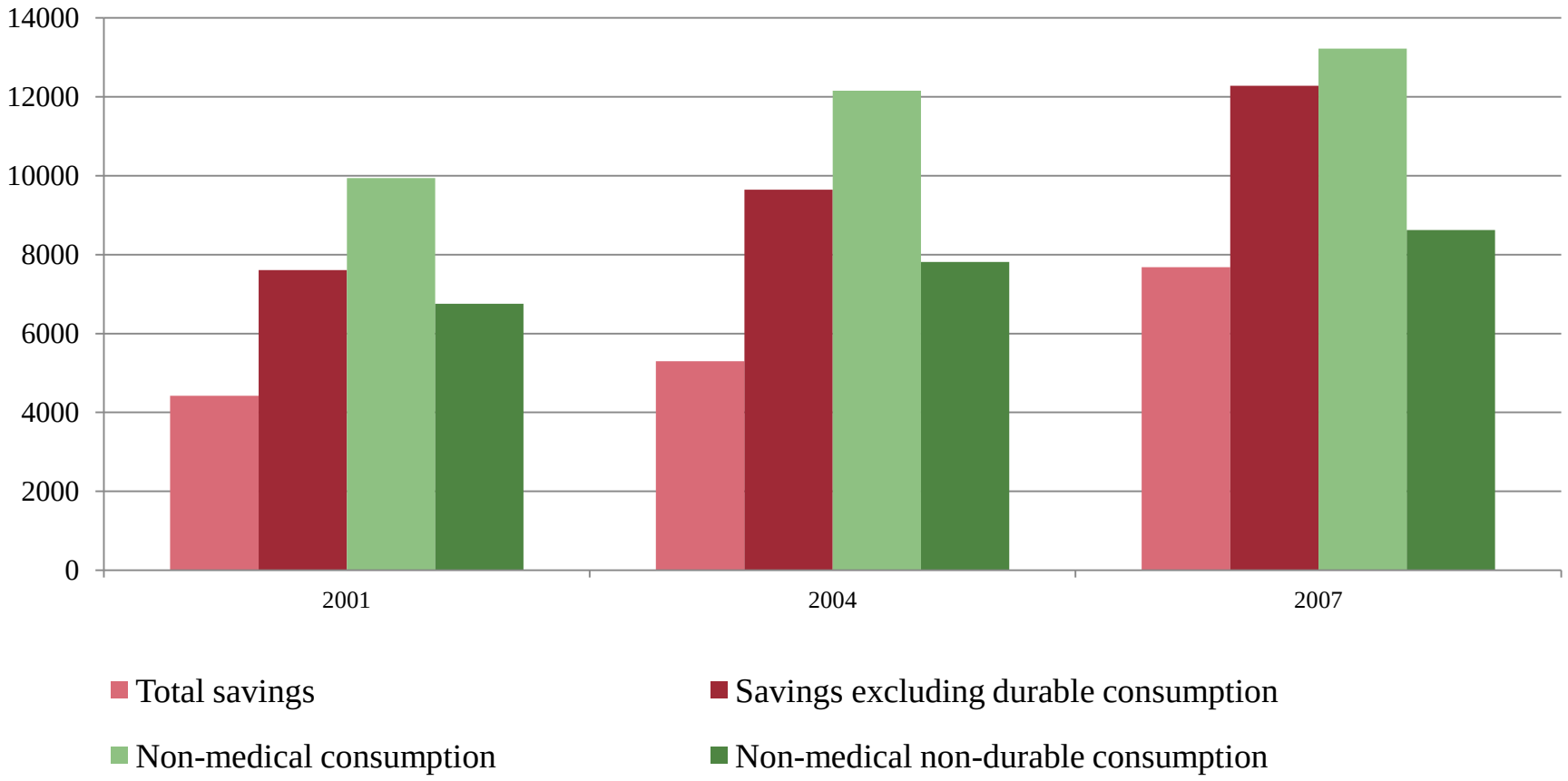
Health Insurance of Household Members (Proportion)



Other independent variables (Table 3.2)

Cohorts Descriptive Statistics (2)

Dependent Variable: HHs' savings and consumption expenditures



Empirical Results: 2001-2004

Difference-in-Difference estimates based on pseudo-panel data (FE model)

Comparison group	Y in absolute values		Y in ratios	
	Y=ln(TOTSAV)	Y=ln(NMCON)	Y=TOTSAV/HHINC	Y=NMCON/HHINC
SSS	0.211	0.247*	0.676	-0.686
CSMBS	0.100	-0.018	0.223	-0.224
Private HI	-0.653	-0.167	1.367	-1.315
MWS	-0.104	-0.062	1.211	-1.255
VHCS	0.222	0.025	0.577	-0.576
Weighted average	0.052	0.010	0.742	-0.759

Note: * p<.1; ** p<.05; *** p<.01

Empirical Results: 2001-2007

Difference-in-Difference estimates based on pseudo-panel data (RE model)

Comparison group	Y in absolute values		Y in ratios	
	Y=ln(TOTSAV)	Y=ln(NMCON)	Y=TOTSAV/HHINC	Y=NMCON/HHINC
SSS	0.781	0.544***	0.440	-0.434
CSMBS	0.558**	0.068	0.414	-0.412
Private HI	0.587	-0.740*	-0.247	0.282
MWS	0.167	0.020	0.323	-0.350
VHCS	0.980**	0.091	0.530	-0.543
Weighted average	0.528*	0.111	0.396	-0.406

Note: * p<.1; ** p<.05; *** p<.01

Essay1: Robustness Analyses

- Alternative measures of consumption and savings
  - Consider non-durable consumption expenditure and net assets
  - Short run: UCS has a positive impact on NTASST ratio.
  - Long run: UCS has a positive impact on NDSAV and NMNDCON.
- Include remaining uninsured
  - No short-run impacts of UCS on both savings and consumption
  - Long run: UCS has positive impacts on savings (CSMBS is base) and on consumption (SSS is base).
- Quantile regressions
  - For both short run and long run, the magnitude of impact is greater for lower quantile and becomes smaller for upper quantile (SSS is base).

Conclusion and Discussion (1)

- The theoretical model shows that the UCS implementation has an *income effect* in addition to a risk-reduction effect.
- Empirical findings show *no* evidence of a reduction in savings either in the short or long run.
- The UCS has a significantly *positive impact* on both savings and non-medical consumption (absolute values) in the long run.

Conclusion and Discussion (2)

- Implications:
  - *No reduction in precautionary savings*
  - UCS *only* produces an *income effect* in the *long run*, due to reduction in OOP expenditure
    - Welfare gain for UCS beneficiaries
- Possible interpretations of no reduction in precautionary savings:
  - Households may set aside very little or nothing for precautionary purposes.
  - UCS beneficiaries do not utilize health insurance benefits under the UCS.