# Monetary Policy and Household Income Distribution: An Empirical Analysis from Cambodia

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# Motivation

▶ The **stable macroeconomic** environment in the last two decades in Cambodia has attracted foreign and domestic investments in a separate sector. How does monetary policy work? How does monetary policy affect to people? ▸ M2 and Inflation

▶ Cambodia's economy has sustained an average annual growth rate of **7.7%** between 1995-2019. Everyone knew that, but actually who are **benefit** from this growth?

▶ Its per capita income has grown from **$323** in 1995 to **$1,621** in 2019, and the poverty rate fell from **47.8%** in 2007 to **17.8%** in 2020.

▶ The literature shows that recent decades have witnessed rising income and wealth inequality in **developing economies** and advanced economies with possibly serious repercussions.

# This Paper

▶ **Research question:** How does the expansionary monetary policy affects macroeconomic aggregates, aggregate consumption and income inequality in Cambodia?

# Related Literature

▶ **Monetary Policy Shock on Economic Aggregates**: Lucas (1996), Romer and Romer (2004), Albanesi (2001), Doepke and Schcider (2006), Mumtaz and Theophilopoulou (2017), Samarina and Nguyen (2019), Sims (1980), Bacchiocchi and Fanelli (2015), Uhlg (2005), Christiano and Eichenbaum (2005).

▶ **The Effectiveness of the MP on Inequality**: Auclert (2019), Coibon et al (2017), Andersen et al (2020), Gornemann, Kuester, and Nakajima (2016), Williamson (2008), Lenza and Slacalek (2018), Albert, Perez-Bernabeu, and Denalver (2020).

▶ **Household Income Inequality**: Lorez (1905), Piketty (2013), Bastagli, Coady and Gupta (2012), Cornia and Martorano (2012), Hansen and Gjonbalay (2019), Solt (2020).
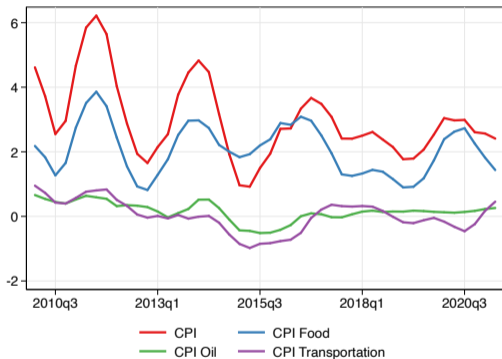
# Cambodia's Monetary Policy

The principal mission of the National Bank of Cambodia (NBC) is to **determine and direct the MP** aimed at maintaining **price stability** in order to facilitate economic development, within the framework of the country's economic and financial policy. Through prudent conduct of MP, **inflation** has been managed at low rate with an annual average of **less than 5%**, which is appropriate for developing countries. However, in the context of a **highly dollarized** economy, the effective conduct of MP is constrained and the NBC **loses its ability** to act as the lender of last resort. Currently, the MP instruments used to achieve price stability is setting **reserve requirement rate** and conducting foreign exchange intervention. At the same time, the NBC is developing additional MP instruments to enhance monetary policy effectiveness through issuing **Negotiable Certificates of Deposit** (NCDs), developing **interbank** and **monetary markets**, promoting **the use of riel**, and so on.
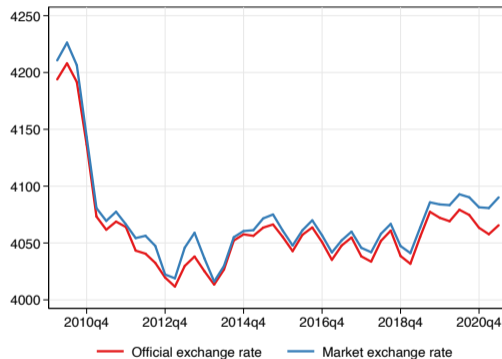
— Statement by the National Bank of Cambodia on its website

# Inflation and the Consumer Price Index
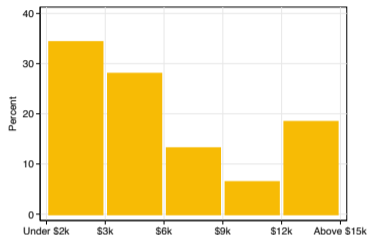


Consumer Prices Index       Exchange Rates

**Source:** The National Bank of Cambodia and the National Institute of Statistics.
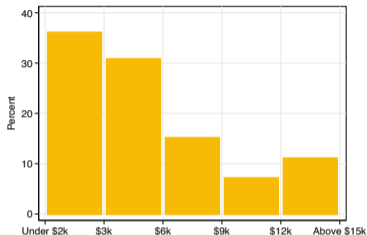
# Household Economy
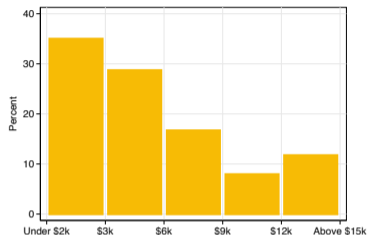
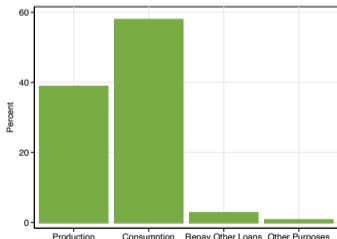

**CSES 2014** — Income / Loan
**CSES 2017** — Income / Loan
**CSES 2019/2020** — Income / Loan
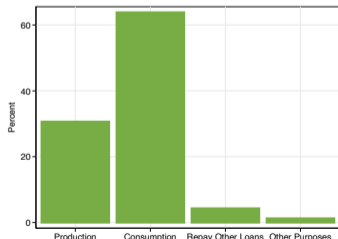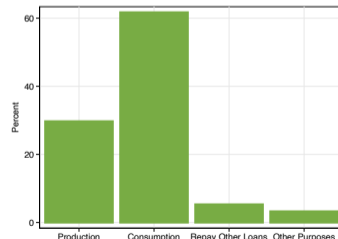
# Data

- ▶ Monetary policy shocks on macroeconomic aggregates
  - Sample: A time series data between 2010Q–2021Q2
  - Variable: Inflation, M2, output, the unemployment rate, the exchange rate, and the interest rate
- ▶ Monetary policy transmission through the average propensity to consume
  - Sample: Cambodia Socio-Economic Survey 2014, 2017, and 2019/2020
  - Variable:
- ▶ Household Income Distribution
  - Sample: The cross-sectional data of the Cambodia Socio-Economic Survey 2014, 2017, 2019/2020.
  - Main Variable: Income. Sum up all income sources from household members, who lives in the same dwelling.

# A Model of Monetary Policy Shock

▶ The SVAR model in short form:

$$
Y_t = \begin{bmatrix} \pi_t \\ y_t \\ i_t \\ u_t \\ log(E_t) \\ log(M2_t) \end{bmatrix}, \quad t = 1, \cdots, T
$$

# Summary Statistics

|  | Obs. | Mean | S.D. | Min. | Max. | Unit | Source |
|---|---|---|---|---|---|---|---|
| Inflation | 46 | 3.01 | 1.51 | 0.70 | 7.06 | Percent | NIS |
| Output | 46 | 4.83 | 1.39 | 2.78 | 7.45 | Billion dollars | NIS |
| Unemployment rates | 46 | 0.43 | 0.23 | 0.13 | 0.77 | Percent | ILO |
| Interest rates | 46 | 5.26 | 0.77 | 4.19 | 6.91 | Weighted average rate | NBC |
| Exchange rates | 46 | 4071.58 | 52.64 | 3985.60 | 4257.36 | Khmer riels/US dollars | NBC |
| M2 | 46 | 15.66 | 9.84 | 4.13 | 36.29 | Billion dollars | NBC |

**Note:** The table displays the descriptive statistics of macroeconomic variables that using for the investigation of monetary policy shocks. The second column reports the number of observations, the third presents the mean, and the fourth column is standard deviation errors. Many variables are observed quarterly, and some variables, such as the unemployment rate and output, are recorded annually. I suppose the real input growth and the employment rate have the same proposition every quarter in a whole year, and then I multiply it with 4 to get the quarter data. The dataset comes from the National Institute of Statistics, the International Labor Organization, and the National Bank of Cambodia.

# Granger Causality Tests for VAR Model

| Regressor | Inflation | M2 | Output | Unemployment | Exchange rate | Interest rate |
|-----------|-----------|------|--------|--------------|---------------|---------------|
| Inflation | — | 0.000 | 0.076 | 0.510 | 0.162 | 0.493 |
| M2 | 0.004 | — | 0.017 | 0.555 | 0.000 | 0.036 |
| Output | 0.045 | 0.078 | — | 0.153 | 0.000 | 0.000 |
| Unemployment | 0.010 | 0.049 | 0.405 | — | 0.019 | 0.040 |
| Exchange rate | 0.131 | 0.001 | 0.097 | 0.973 | — | 0.158 |
| Interest rate | 0.007 | 0.000 | 0.014 | 0.000 | 0.000 | — |

**Note:** All entries are chi-square test statistics at dregress of freedom with an indicate significant at 1%, 5% and 10% levels, parentheses are *P*-values. The row labeled *Regressor* do not enter the reduced form equation for column variable labeled *Dependent Variable*. The results were computed from a VAR with four lags and a constant term over the 2010Q1–2021:Q2 sample period.

# Impulse Response of Monetary Policy in SVAR
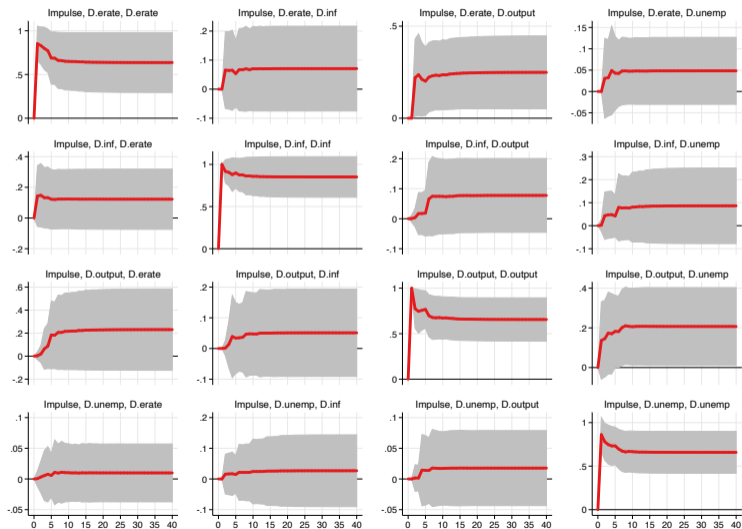
# Impulse Response of Monetary Policy in SVAR
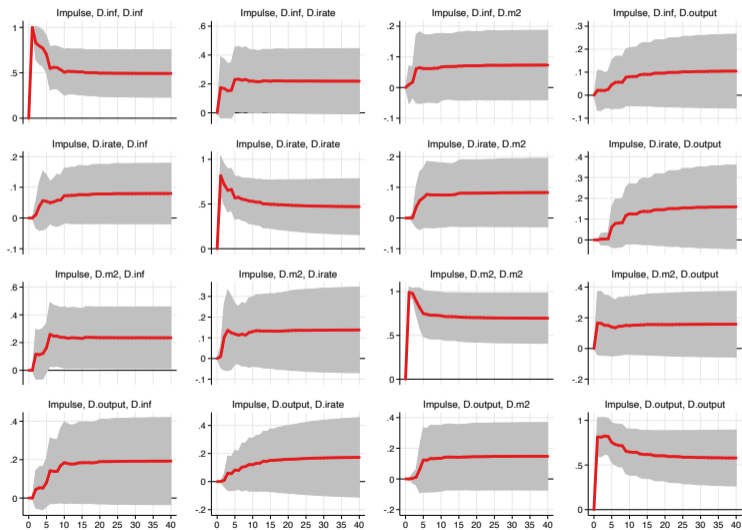
# Redistribution Channel of MP

▶ I followed the monetary policy partial equilibrium decomposition model of Auclert (2019) that he makes the assumption that for an individual a one time shock to nominal interest rates:
- a change in the real interest rate **$R$**
- a one of change in the price level **$P$**
- a transitory change in income **$Y$**

▶ Aggregate consumption response to 5 channels:

$$dC = \underbrace{\mathbb{E}_I\left[\frac{Y_i}{Y}A\widehat{P}C_i\right]dY}_{\text{Aggregate income channel}} + \underbrace{\text{Cov}_I\left(A\widehat{P}C_i, dY_i - Y_i\frac{dY}{Y}\right)}_{\text{Earnings heterogeneity channel}} - \underbrace{\text{Cov}_I(A\widehat{P}C_i, NNP_i)\frac{dP}{P}}_{\text{Fisher channel}}$$

$$+ \left(\underbrace{\text{Cov}_I(A\widehat{P}C_i, URE_i)}_{\text{Interest rate exposure channel}} - \underbrace{\mathbb{E}_I\left[\omega_i(1 - A\widehat{P}C_i)c_i\right]}_{\text{Intertemporal substitution channel}}\right)\frac{dR}{R}$$

# Redistribution Channel of MP

▶ I make two assumptions on these structural parameters as its turn the equation into a full set of estimable moments:

■ assume that individuals have common elasticity of intertemporal substitution, $\sigma_i = \sigma$ and common elasticity of relative income to aggregate income $\gamma_i = \gamma$ for all $i$

$$\frac{dC}{C} = (\mathcal{M} + \gamma\mathcal{E}_Y)\frac{dY}{Y} - \mathcal{E}_P\frac{dP}{P} + (\mathcal{E}_R - \sigma S)\frac{dR}{R}$$

■ $\mathcal{M}, \mathcal{E}_P, \mathcal{E}_R, \mathcal{E}_Y$, and $\mathcal{S}$ are measurable cross-sectional moments:
  • Do not depend on the source of the shock
  • Do not require identification

■ Estimable moments model

■ If $\gamma < 0$, shows that redistribution amplifies through all 3 channels

# Unhedged Interest Rate Exposures

$$URE_i = Y_i - T_i - C_i + A_i - L_i$$

- $Y_i$: Income all sources
- $T_i$: Taxes
- $C_i$: Consumption (including durables)
- $A_i$: Maturing asset stocks
- $L_i$: Maturing liability stocks

# Scenario Assumptions Based on Auclert (2019)

Table: Mapping model to data objects by scenario assumptions

| **Exposure measure:** *URE* | | **Duration assumptions by scenario in year** | | | | |
|---|---|---|---|---|---|---|
| | Data | Quarterly | Short | Benchmark | Long | Annual |
| $Y_i$ | Gross income from all sources | | | | | |
| $T_i$ | Taxes net of transfers | | | | | |
| $C_i$ | Nondurables $+(1-\epsilon)\times$ Durables | | | | | |
| $A_i$ | Deposits | 0.25 | 0.25 | 0.50 | 0.75 | 1 |
| $L_i$ | Credit Adjustable Rate Mortgages | 0.25 | 0.25 | 0.50 | 0.75 | 1 |
| Exposure measure: *NNP* | | Data | | | | |
| Nominal assets | | Deposits | | | | |
| Nominal liabilities | | Mortgages + Household debt | | | | |

# Main Summary Statistics

| Survey | CSES 2014 | | CSES 2017 | | CSES 2019 | |
|---|---|---|---|---|---|---|
| Variable | Mean | SD | Mean | SD | Mean | SD |
| Net income ($Y_i - T_i$) | 1.83 | 2.74 | 1.07 | 1.08 | 1.02 | 0.93 |
| Consumption ($C_i$) | 1.00 | 0.70 | 1.00 | 0.73 | 1.00 | 0.75 |
| Maturing assets ($A_i$) | 1.61 | 5.10 | 0.13 | 2.18 | 0.03 | 2.00 |
| Maturing liabilities ($L_i$) | 0.17 | 0.39 | 0.35 | 0.85 | 0.62 | 1.41 |
| Unhedged interest rate exposure ($URE_i$) | **2.17** | 7.49 | **-0.14** | 3.36 | **-0.53** | 3.49 |
| Nominal assets | 0.71 | 1.46 | 0.30 | 0.45 | 0.16 | 0.29 |
| Nominal liabilities | 0.08 | 0.19 | 0.17 | 0.42 | 0.31 | 0.71 |
| Net nominal position ($NNP_i$) | **0.60** | 1.39 | **0.13** | 0.55 | **-0.14** | 0.76 |
| Gross income ($Y_i$) | 1.96 | 2.93 | 1.15 | 1.16 | 1.09 | 0.99 |
| Average propensity to consume ($APC_i$) | 0.73 | 0.30 | 0.82 | 0.25 | 0.80 | 0.25 |

**Note:** All statistics are computed using sample weights.
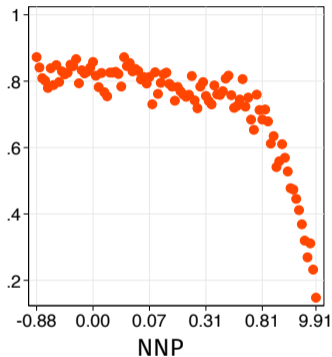
# Unhedged Interest Rate Exposure
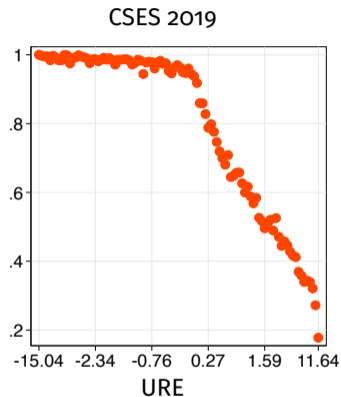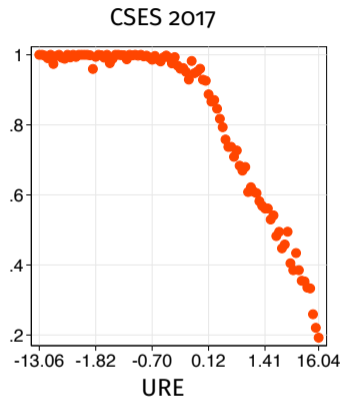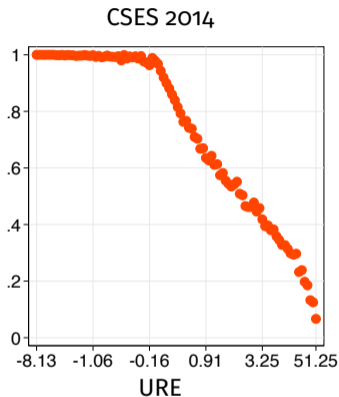


$$\mathcal{E}_R = \mathrm{Cov}_I(\widehat{APC}_i, URE_i) < 0$$

- falls in interest rates increase consumption demand

# Net Nominal Position
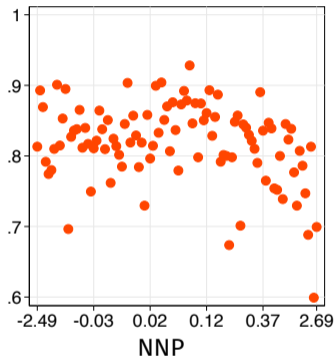


CSES 2014    CSES 2017    CSES 2019
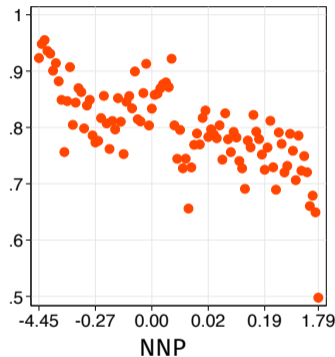
$$\mathcal{E}_P = \mathrm{Cov}_I(\widehat{APC}_i, NNP_i) < 0$$

- unexpected increases in nominal prices tend to increase consumption

# Gross Income
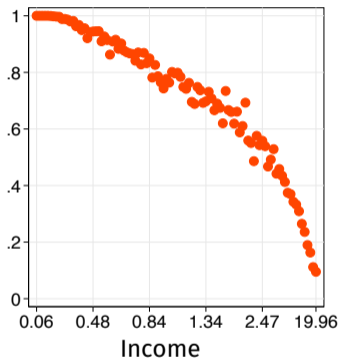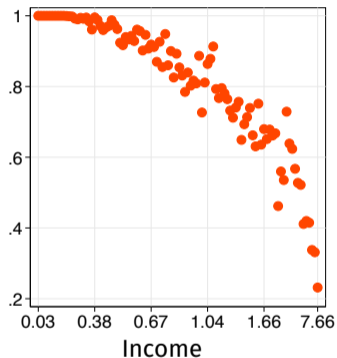


CSES 2014 — CSES 2017 — CSES 2019
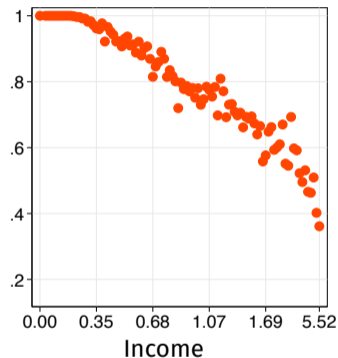
$$\mathcal{E}_Y = \mathrm{Cov}_I(\widehat{APC}_i, Y_i) < 0$$

- an amplification role for the earnings heterogeneity channel

# Robustness

- ▶ I kept all negetive household income reported and calculus the redistribution elasticities of the three main chaceel: unhedged interest rate, net normal position and income.

- ▶ *APC* and *URE* have siginicantly negiative correlation. And it has a large parcentile for *APC* in CESE 2017 and 2019.
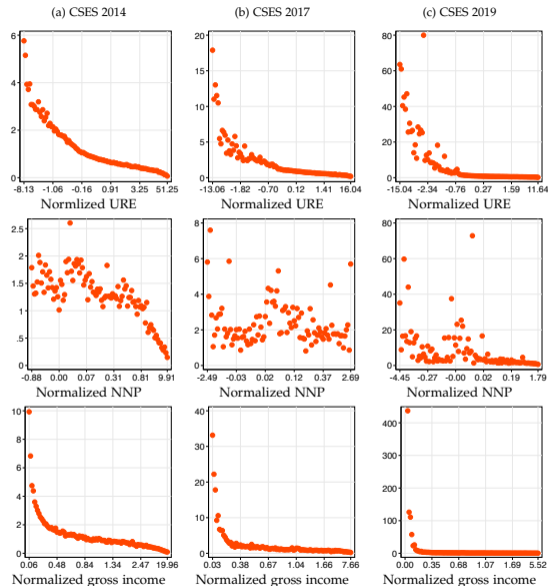
# Estimates of All 7 Moments

| Survey | CSES 2014 | | CSES 2017 | | CSES 2019 | |
|---|---|---|---|---|---|---|
| | Estimate | 95% CI | Estimate | 95% CI | Estimate | 95% CI |
| $\widehat{\mathcal{E}_R}$ | −1.51 | [−1.56, −1.46] | −0.62 | [−0.70, −0.53] | −0.63 | [−0.70, −055] |
| $\widehat{\mathcal{E}_R^{NR}}$ | 0.06 | [0.02, 0.10] | −0.74 | [−0.83, −0.65] | −1.05 | [−1.13, −0.97] |
| $\hat{S}$ | 0.25 | [0.24, 0.26] | 0.14 | [0.13, 0.15] | 0.15 | [0.14, 0.15] |
| $\widehat{\mathcal{E}_P}$ | −0.30 | [−0.32, −0.29] | −0.02 | [−0.03, −0.00] | −0.03 | [−0.05, −0.01] |
| $\widehat{\mathcal{E}_P^{NR}}$ | 0.26 | [0.25, 0.28] | 0.09 | [0.08, 0.11] | −0.15 | [−0.16, −0.13] |
| $\widehat{\mathcal{E}_Y}$ | −1.34 | [−1.37, −1.32] | −0.19 | [−0.22, −0.17] | −0.15 | [−0.18, −0.13] |
| $\widehat{\mathcal{M}}$ | 0.74 | [0.72, 0.87] | 0.74 | [0.72, 0.77] | 0.72 | [0.70, 0.74] |

**Note:** All statistics are computed using sample weights.

- The $\sigma$ is too large around 4 to 6. The redistribution effect may be as not important as the substitution effect in explaining aggregate consumption responds to changes in real interest rates.

Table: Estimated redistribution elasticities $\mathcal{E}_R$ for the duration scenarios

| | | Duration scenario | | | | |
|---|---|---|---|---|---|---|
| | | Quarterly | Short | Benchmark | Long | Annual |
| $\widehat{\mathcal{E}_R}$ | CSES 2014 | $-2.52$ | $-2.52$ | $-1.51$ | $-1.18$ | $-1.01$ |
| | | $[-2.60, -2.43]$ | $[-2.60, -2.43]$ | $[-1.56, -1.46]$ | $[-1.04, -0.97]$ | $[-2.68, -2.58]$ |
| | CSES 2017 | $-1.03$ | $-1.03$ | $-0.62$ | $-0.48$ | $-0.20$ |
| | | $[-1.17, -0.88]$ | $[-1.17, -0.88]$ | $[-0.70, -0.53]$ | $[-0.55, -0.42]$ | $[-0.27, -0.12]$ |
| | CSES 2019 | $-1.06$ | $-1.06$ | $-0.63$ | $-0.48$ | $-0.41$ |
| | | $[-1.20, -0.93]$ | $[-1.20, -0.93]$ | $[-0.70, -0.55]$ | $[-0.54, -0.43]$ | $[-0.46, -0.36]$ |

# Cambodian Map

# Household Income Distribution

| | Gini index | P90/P10 | P90/P50 | P10/P50 | P75/P25 | Mean |
|---|---|---|---|---|---|---|
| **Panel A: CSES 2014** | | | | | | |
| Phnom Penh | 0.52 | 11.14 | 3.89 | 0.35 | 3.37 | 12894.50 |
| Central Plains | 0.58 | 15.93 | 3.95 | 0.25 | 3.69 | 7397.87 |
| Tonle Sap | 0.60 | 17.20 | 4.53 | 0.26 | 3.89 | 8095.70 |
| Coastal | 0.60 | 15.08 | 4.03 | 0.27 | 3.89 | 7915.15 |
| Plateau and Mountains | 0.54 | 11.65 | 3.19 | 0.27 | 3.22 | 6182.62 |
| Total | 0.57 | 14.86 | 4.01 | **0.27** | 3.64 | **8370.50** |
| **Panel B: CSES 2017** | | | | | | |
| Phnom Penh | 0.42 | 7.51 | 2.33 | 0.31 | 2.53 | 7397.00 |
| Central Plains | 0.51 | 19.71 | 3.25 | 0.17 | 3.74 | 5840.37 |
| Tonle Sap | 0.49 | 13.73 | 3.02 | 0.22 | 3.17 | 4829.05 |
| Coastal | 0.47 | 11.65 | 2.86 | 0.25 | 3.76 | 4881.58 |
| Plateau and Mountains | 0.43 | 10.21 | 2.42 | 0.24 | 2.89 | 4962.95 |
| Total | 0.47 | 13.66 | 2.85 | **0.23** | 3.20 | **5707.81** |
| **Panel C: CSES 2019** | | | | | | |
| Phnom Penh | 0.43 | 12.69 | 2.59 | 0.20 | 2.92 | 7786.96 |
| Central Plains | 0.47 | 18.78 | 2.68 | 0.14 | 3.30 | 6129.13 |
| Tonle Sap | 0.46 | 16.78 | 2.73 | 0.16 | 3.53 | 5478.37 |
| Coastal | 0.48 | 19.97 | 2.98 | 0.15 | 3.52 | 6553.62 |
| Plateau and Mountains | 0.49 | 18.87 | 2.93 | 0.16 | 3.74 | 5928.51 |
| Total | 0.47 | 17.69 | 2.76 | **0.16** | 3.43 | **6074.43** |

► In 2019/2020, the Gini index has moved **slightly away** from household income inequality in 2014.

► The income gaps between low-income households at 10% and high-income household at 90% has **climbed sharply** in 2019/2020.

► The income gaps between middle-income households at 50% and wealthiest households at 90% have significant **positive change**.

► The income gap between households at 10% and 50% has **decreased significantly**.

# Household Consumption Distribution

| | Gini index | P90/P10 | P90/P50 | P10/P50 | P75/P25 | Mean |
|---|---|---|---|---|---|---|
| **Panel A: CSES 2014** | | | | | | |
| Phnom Penh | 0.30 | 4.01 | 2.09 | 0.52 | 2.10 | **6694.77** |
| Central Plains | 0.35 | 4.87 | 2.38 | 0.49 | 2.31 | 4172.24 |
| Tonle Sap | 0.35 | 5.08 | 2.44 | 0.48 | 2.34 | 4209.12 |
| Coastal | 0.33 | 4.49 | 2.35 | 0.52 | 2.19 | 4116.79 |
| Plateau and Mountains | 0.35 | 5.02 | 2.45 | 0.49 | 2.30 | 4116.11 |
| Total | 0.34 | 4.80 | 2.36 | 0.49 | 2.28 | **4590.74** |
| **Panel B: CSES 2017** | | | | | | |
| Phnom Penh | 0.28 | 3.57 | 1.91 | 0.54 | 1.89 | **6756.90** |
| Central Plains | 0.35 | 4.80 | 2.19 | 0.46 | 2.35 | 5520.38 |
| Tonle Sap | 0.34 | 4.06 | 2.11 | 0.52 | 2.15 | 4821.27 |
| Coastal | 0.36 | 5.63 | 2.66 | 0.47 | 2.08 | 6667.95 |
| Plateau and Mountains | 0.35 | 4.76 | 2.22 | 0.47 | 2.25 | 5238.44 |
| Total | 0.33 | 4.38 | 2.14 | 0.49 | 2.17 | **5606.37** |
| **Panel C: CSES 2019** | | | | | | |
| Phnom Penh | 0.32 | 4.31 | 2.06 | 0.48 | 2.05 | **8526.88** |
| Central Plains | 0.36 | 4.80 | 2.25 | 0.47 | 2.25 | 5943.27 |
| Tonle Sap | 0.37 | 5.10 | 2.41 | 0.47 | 2.26 | 5737.90 |
| Coastal | 0.37 | 5.65 | 2.62 | 0.46 | 2.37 | 7099.85 |
| Plateau and Mountains | 0.40 | 6.28 | 2.61 | 0.42 | 2.65 | 6178.18 |
| Total | 0.37 | 5.17 | 2.38 | 0.46 | 2.31 | **6262.90** |

▶ Household consumption inequality has **increased** from 0.34 in 2014 to 0.37 in 2019/2020.

▶ The differences in consumption between households with high expenditures at 90% and low expenditures at 10% increased **five times** in 2019/2020.

▶ On average, household spending **increased** over time during the sample study.

# Household Maturing Assets Distribution

| | Gini index | P90/P10 | P90/P50 | P10/P50 | P75/P25 | Mean |
|---|---|---|---|---|---|---|
| **Panel A: CSES 2014** | | | | | | |
| Phnom Penh | 0.57 | 23.65 | 4.00 | 0.17 | 5.87 | **3541.53** |
| Central Plains | 0.63 | 33.62 | 4.61 | 0.14 | 5.41 | 3403.52 |
| Tonle Sap | 0.60 | 30.93 | 4.38 | 0.14 | 5.60 | 3554.84 |
| Coastal | 0.67 | 30.01 | 6.54 | 0.22 | 4.82 | 4033.18 |
| Plateau and Mountains | 0.57 | 25.53 | 3.46 | 0.14 | 4.85 | 2577.41 |
| Total | 0.60 | 29.83 | 4.37 | 0.15 | 5.43 | **3384.54** |
| **Panel B: CSES 2017** | | | | | | |
| Phnom Penh | 0.58 | 22.56 | 4.12 | 0.18 | 5.36 | **4632.05** |
| Central Plains | 0.61 | 49.41 | 5.75 | 0.12 | 7.39 | 4929.70 |
| Tonle Sap | 0.57 | 28.37 | 4.58 | 0.16 | 4.73 | 4052.40 |
| Coastal | 0.54 | 25.99 | 3.09 | 0.12 | 5.10 | 3766.30 |
| Plateau and Mountains | 0.53 | 23.12 | 3.22 | 0.14 | 4.21 | 3114.54 |
| Total | 0.58 | 32.84 | 4.57 | 0.15 | 5.64 | **4292.32** |
| **Panel C: CSES 2019** | | | | | | |
| Phnom Penh | 0.54 | 26.59 | 3.64 | 0.14 | 4.38 | **4610.31** |
| Central Plains | 0.54 | 21.59 | 3.33 | 0.15 | 4.27 | 4434.77 |
| Tonle Sap | 0.54 | 22.10 | 3.82 | 0.17 | 4.57 | 3846.03 |
| Coastal | 0.55 | 29.69 | 4.16 | 0.14 | 4.90 | 4681.12 |
| Plateau and Mountains | 0.56 | 23.03 | 4.02 | 0.17 | 4.90 | 4517.49 |
| Total | 0.54 | 23.24 | 3.71 | 0.16 | 4.54 | **4293.06** |

► Household assets inequality has **decreased** from the Gini coefficient 0.60 in 2017 to 0.54 in 2019/20.

► In terms of real value if we convert these assets into USD, on average, Cambodian households have a wealth of about $4,300. Phnom Penh, has a l**arge share** of assets.

▸ Asset Types

# Household Nominal Liabilities Distribution

| | Gini index | P90/P10 | P90/P50 | P10/P50 | P75/P25 | Mean |
|---|---|---|---|---|---|---|
| **Panel A: CSES 2014** | | | | | | |
| Phnom Penh | 0.50 | 25.00 | 3.45 | 0.14 | 6.00 | 1877.99 |
| Central Plains | 0.55 | 24.00 | 5.00 | 0.21 | 6.40 | 1158.65 |
| Tonle Sap | 0.55 | 20.80 | 4.52 | 0.22 | 6.00 | 1068.30 |
| Coastal | 0.53 | 12.50 | 5.00 | 0.40 | 5.00 | 1073.01 |
| Plateau and Mountains | 0.49 | 15.00 | 3.75 | 0.25 | 6.67 | 1226.66 |
| Total | 0.53 | 21.36 | 4.42 | 0.21 | 6.18 | 1256.24 |
| **Panel B: CSES 2017** | | | | | | |
| Phnom Penh | 0.63 | 33.33 | 6.67 | 0.20 | 10.00 | 3506.75 |
| Central Plains | 0.56 | 20.40 | 3.40 | 0.17 | 6.00 | 2551.57 |
| Tonle Sap | 0.62 | 24.00 | 4.80 | 0.20 | 6.00 | 2622.08 |
| Coastal | 0.57 | 20.00 | 4.08 | 0.20 | 6.00 | 2278.68 |
| Plateau and Mountains | 0.50 | 16.67 | 2.50 | 0.15 | 4.00 | 2611.95 |
| Total | 0.58 | 23.50 | 4.36 | 0.18 | 6.53 | 2765.73 |
| **Panel C: CSES 2019** | | | | | | |
| Phnom Penh | 0.53 | 38.33 | 4.60 | 0.12 | 4.80 | 9370.50 |
| Central Plains | 0.54 | 21.70 | 4.17 | 0.19 | 4.67 | 5334.45 |
| Tonle Sap | 0.57 | 26.00 | 4.33 | 0.17 | 6.68 | 5250.24 |
| Coastal | 0.54 | 20.00 | 5.00 | 0.25 | 5.00 | 6907.65 |
| Plateau and Mountains | 0.57 | 24.00 | 5.00 | 0.21 | 5.33 | 6133.30 |
| Total | 0.55 | 24.86 | 4.48 | 0.19 | 5.48 | 5959.36 |

▶ The National Institute of Statistics of Cambodia has estimated that **1.25 million** out of 3.6 million households were **indebted** by 2020. It has a significant increased of approximately **85%** from 2017, and **339%** from 2014.

▶ Debt inequality has also **decreased**.
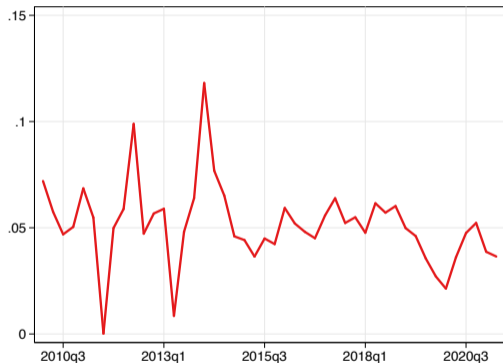
  ▶ Interest Rates

# Conclusion

▶ The MP shock through the interest rate has a positive consequence on inflation, output, and the unemployment rate.

▶ The elasticity of consumption to the real interest rate are negative due to intertemporal substitution and its magnitude depends on $\sigma$. The covariance between APCs and NNPs is negative on average. And the covariance between MPCs and incomes also to be negative in the data.

▶ Cambodia have decreased income, assets, and liabilities inequality at households level over the last seven years, while have rose expenditure inequality.

▶ In the medium term, future research should take into account PM with a heterogeneous and marginal propensity to consume beyond a further elaboration of the household survey in the panel data.

# Appendix

# Broad Money and the Exchange Rate Back
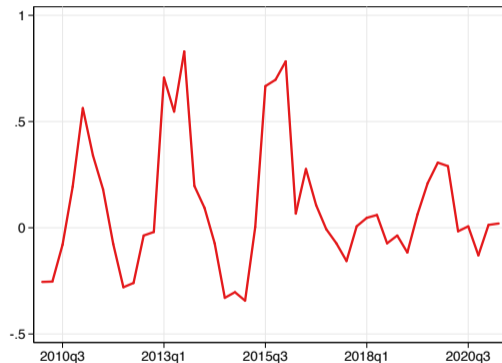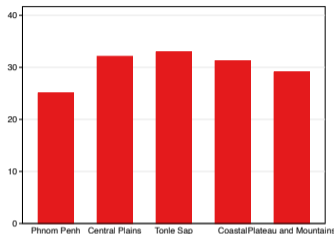


**Source:** The National Bank of Cambodia and the National Institute of Statistics.
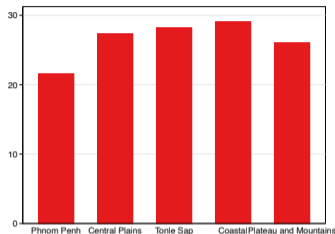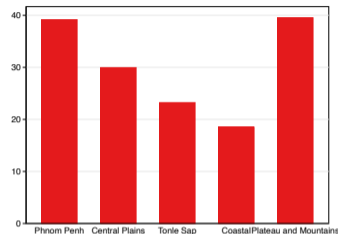
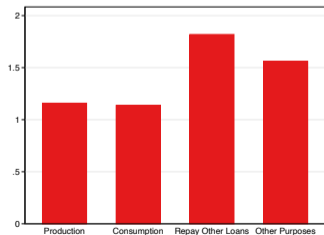# Liabilities and the Interest Rate [Back]



**CSES 2014** · **CSES 2017** · **CSES 2019/2020** — Annual Interest Rates by Loan type (Production, Consumption, Repay Other Loans, Other Purposes) across regions (Phnom Penh, Central Plains, Tonle Sap, Coastal, Plateau and Mountains)
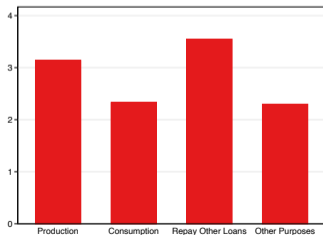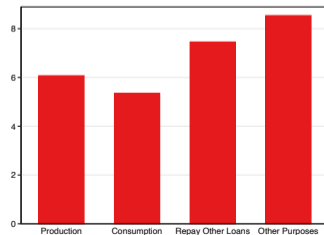
# Household Assets by Region

**Note:** The graph plots the average household wealth by types of assets such as housing assets, building assets, land assets and durable goods assets in the different economic regions. All *y*-axis represent the value of assets in $1,000.

# Lorenz Curve

**Note:** These graphs represent the Lorenz curve of household wealth between 2014–2019/2020 by using the CSES dataset. The first row is the average household income by types of sources, including wages, business income, agricultural incomes, and other incomes. The second row reports the Lorenz curve of the median household expenditure in different factors such as foods, nonfoods, housing spending, and durable goods. The third row is the curve for household assets. The *x*-axis is the population percentage and the *y*-axis is the cumulative outcome proposition. ◂ Back