

# Optimal Sales Taxation in India

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## Introduction

- India has very recently seen a major economic reform through implementation of GST, Goods and Services Tax across the whole nation
- Why GST is important?** The tax reform through GST scheme removes multiple taxes like central taxes, state taxes, duties like excise duty, counter vailing duty, etc., and instead places a uniform tax, Goods and Services Tax (GST)

## Research Question

- Are the tax rates under the current GST scheme optimal? If not, can we find the optimal tax rates based on the categorization of goods under the current scheme.

## Data

- Data used is IHDS (India Human Development Society) Survey II
- Nationally-representative survey of 41,554 households collected from 1503 villages and 971 urban neighborhoods across India
- Variables of Interest: Income and Consumption expenditure
- GST tax slabs: Nil, 3%, 5%, 12%, 18% and 28%

## Model

- The household's optimization problem is:**

$$\max_{\mathbf{c}} u(\mathbf{c}; \eta, w, \boldsymbol{\tau}) \text{ s.t. } w \geq \sum_{i=1}^6 (1 + \tau_i) c_i \text{ and } c_i \geq \bar{c}_i \forall i$$

Where  $w$  is wage,  $\mathbf{c}$  represents the consumption bundle  $(c_1, c_2, \dots, c_6)$  and  $\boldsymbol{\tau}$  represents different tax rates  $(\tau_1, \tau_2, \dots, \tau_6)$

- The policy maker's problem is:**

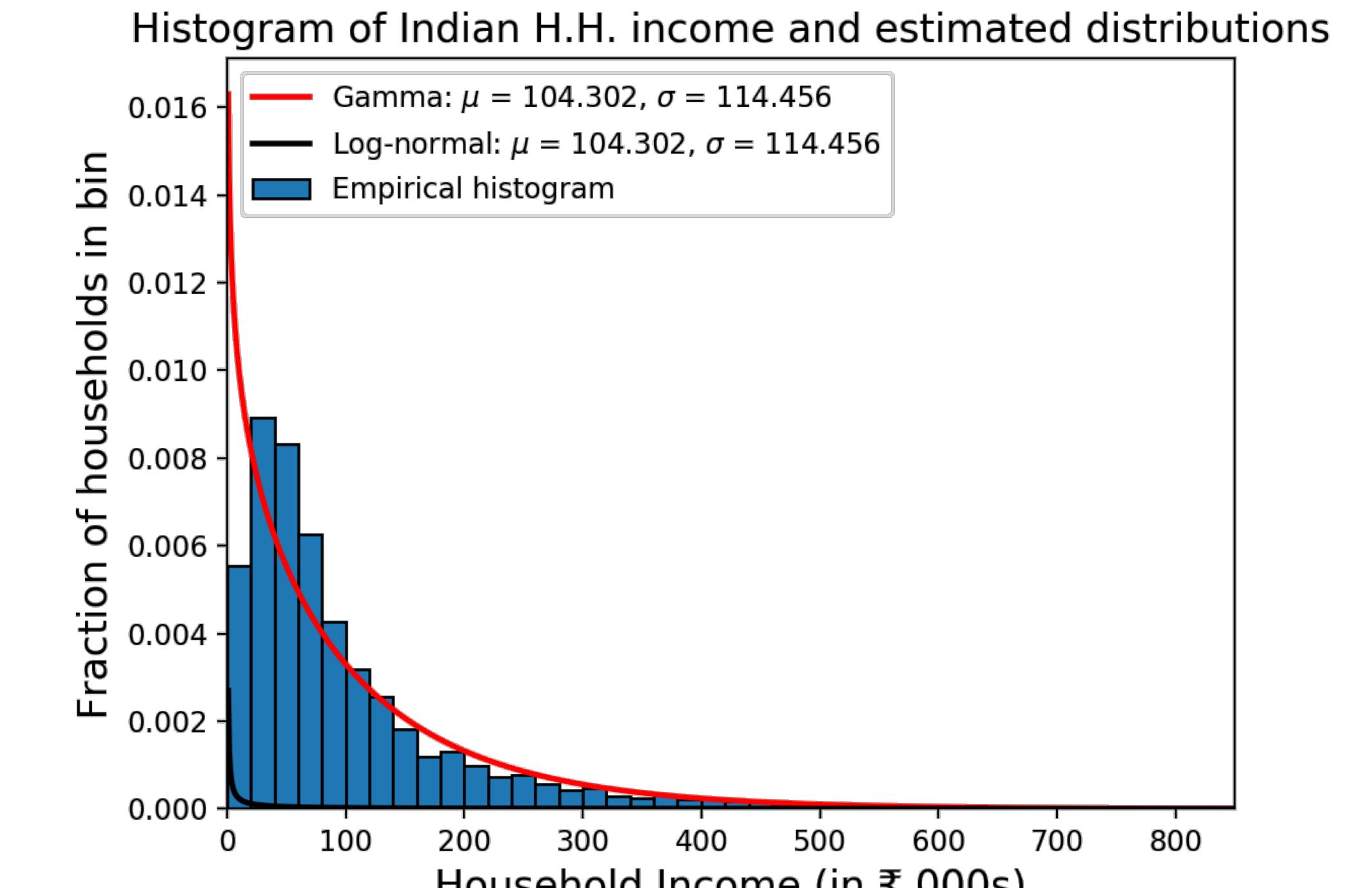
$$\max_{\boldsymbol{\tau}} \int_{\eta} \int_w f(\eta) f(w) u(\mathbf{c}(\eta, w, \boldsymbol{\tau})) d\eta dw$$

$$\text{s.t. } \int_{\eta} \int_w f(\eta) f(w) \sum_{i=1}^6 \tau_i c_i(\eta, w, \boldsymbol{\tau}) d\eta dw \geq \bar{R}$$

Where  $\bar{R}$  is the fixed amount of revenue and  $w$  is wage

## Results – Income distribution

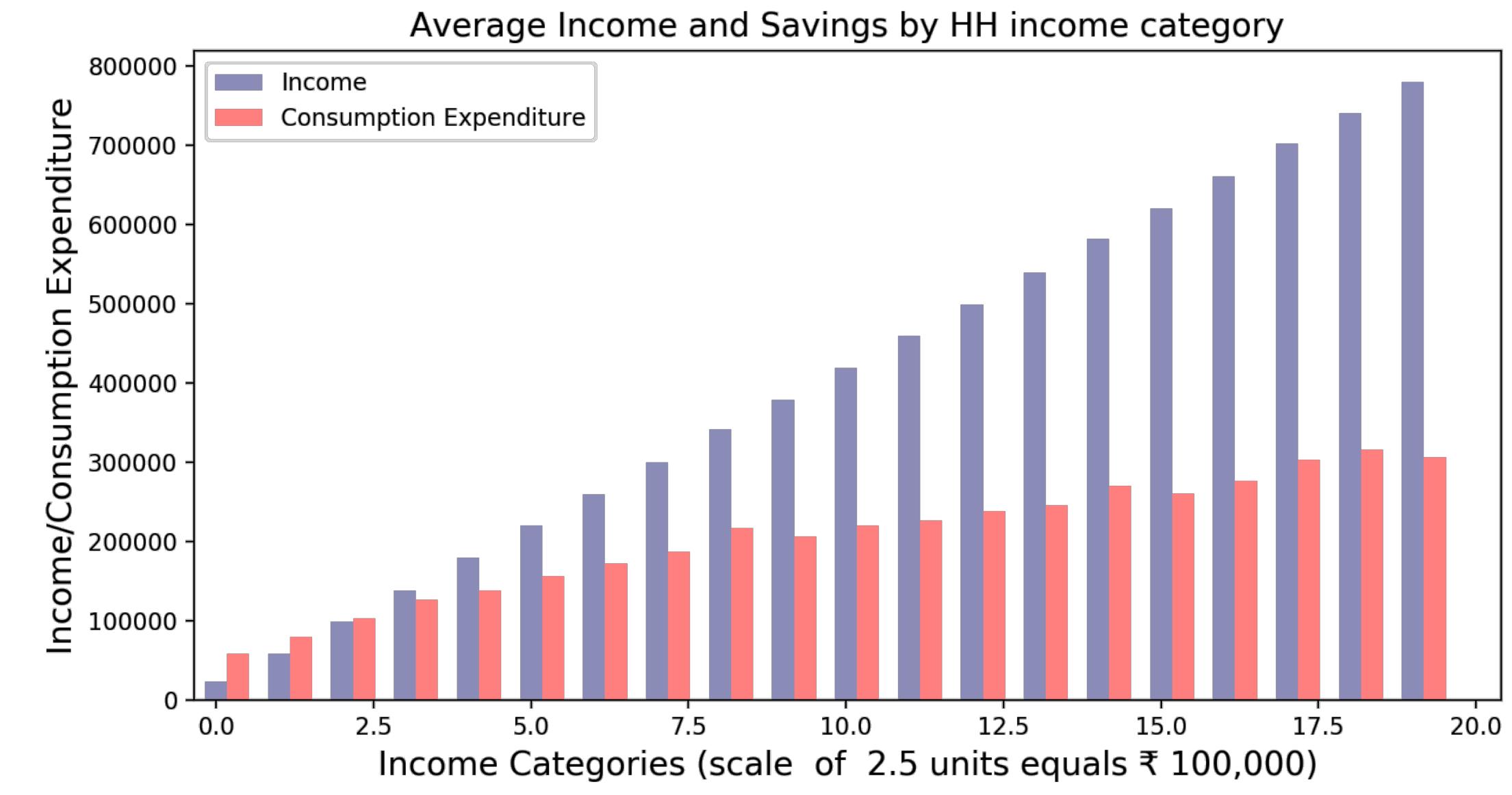
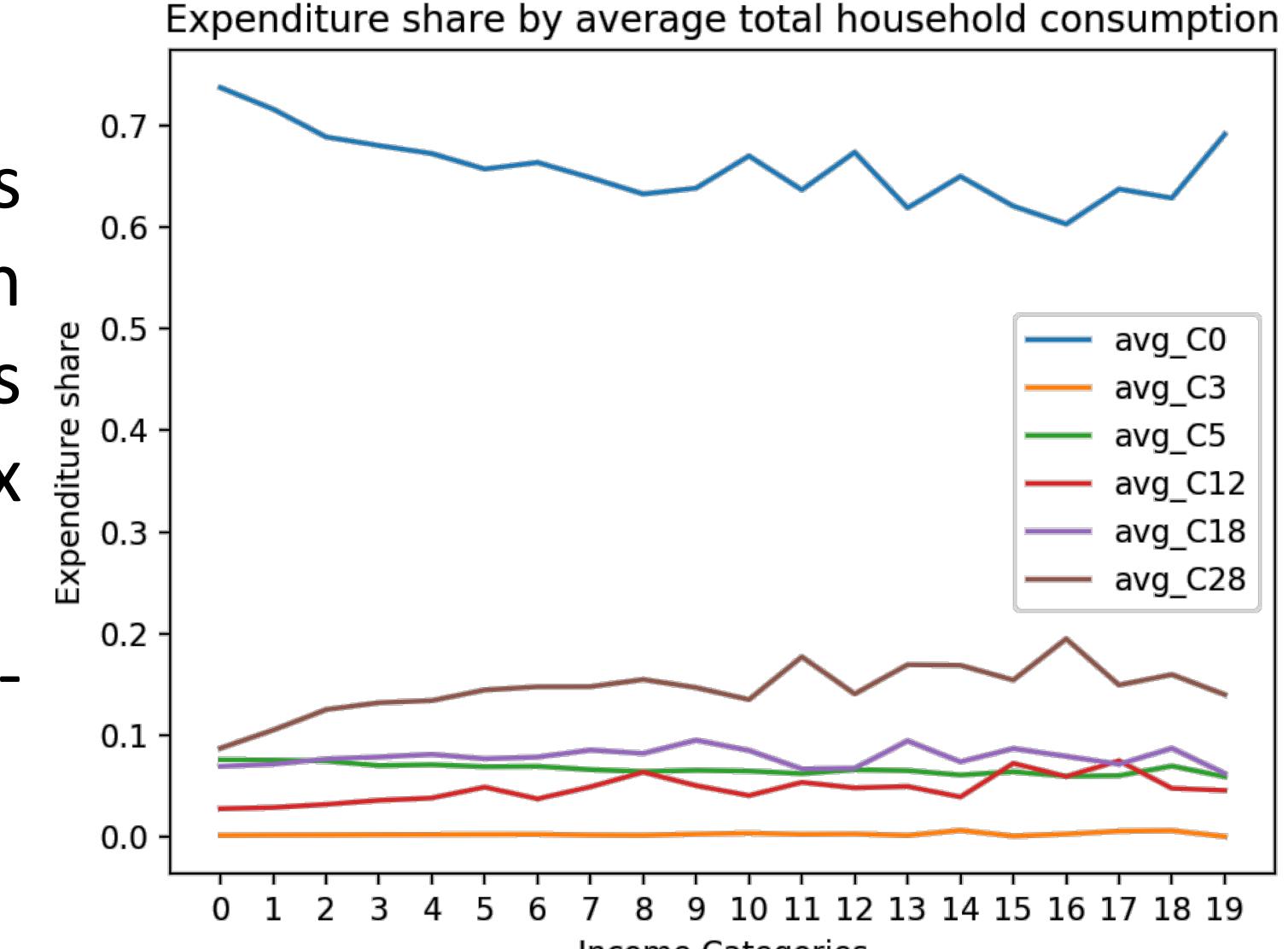
- Negative incomes (~ 10%) from the data were dropped
- Gamma distribution fitted the data relatively well.



## Results – Consumption Expenditures

6 Consumption categories mapped to 6 tax rates under GST scheme (Nil, 3%, 5%, 12%, 18% and 28%).

- Note:** 'avg\_Cx' denotes average consumption expenditure in goods category with 'x%' tax rate
- Each income unit on x-axis equals ₹ 40,000



Estimated minimum consumption for each category using constrained regression:

Goods Categories (tax rate)	$\bar{c}_i$	$\alpha_i$
C0 (Nil)	582.65	0.62
C3 (3%)	0	0.01
C5 (5%)	135.62	0.06
C12 (12%)	0	0.06
C18 (18%)	36.46	0.08
C28 (28%)	0	0.16

## Conclusion

- The minimum consumption for category 3 (luxury goods), and categories 12 and 18 is 0.
- The level of minimum consumption is the highest for 'C0', perhaps owing to its large size.



### Goods Category: C0

Rice, Wheat, Sugar, Kerosene, Pulses, etc.

### Goods Category: C5

Paan/Tobacco, Coffee, Eating out, etc.

### Goods Category: C12

Telephone, crockery, Household items, etc.

### Goods Category: C18

Personal care, soap, furniture/fixtures, etc.

### Goods Category: C28

Transport equipments, Diesel/Petrol/CNG, etc.