GST: Basics and Model

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Lecture 3

Brief Overview of GST in India

- Introduced by 101st Amendment Act, 2016
- Subsumes a variety of state and central indirect taxes, including Service Tax, Additional Duty on Customs, State Sales Tax etc
- Divided into CGST, SGST, IGST
- It is a Value Added Tax, final tax paid by the consumer
- Brings in a single tax rate for any product across all states- One Nation, One Tax
- Multiple tax rates for different goods and services
- Alcohol and Petroleum products currently excluded from GST
- GST Network (GSTN) set up to provide e-filing of returns and reduce interface with tax authorities

The Composition Scheme

- Tax payers have to file a summarised return on a quarterly basis, instead of 37 returns every month.
- Threshold for availing the Scheme currently stands at Rs. 1.5 crore annual turnover.
- No input tax credit (ITC) facility available.
- Available only for goods, not for services
- Detailed records need not be kept. Lower compliance costs.

Composition Scheme: Possible Inefficiency?

- Suppose tax rates under GST and Composition Scheme are β and α respectively.
- Suppose there is only one input, say l to produce the output using the production function $f(l) = l^{\theta}$ where $0 < \theta < 1$
- Let π^C and π^G be the profits under Composition Scheme and GST respectively.
- Assume: The firm operates in a perfectly competitive set up and takes prices as given.
- Therefore, profits are given by:

$$\pi^C = (1 - \alpha)pf(l) - wl \tag{0.1}$$

$$\pi^G = (1 - \beta)[pf(l) - wl] - F \tag{0.2}$$

where p is the final price of output, w is the price of inputs and F is the fixed cost of GST compliance.

Composition Scheme Model Continued 1

- Let I^C and I^G be the optimal inputs used under the Composition Scheme and GST respectively.

$$I^C = [\frac{(1-\alpha)\theta p}{w}]^{\frac{1}{1-\theta}} \tag{0.3}$$

$$I^G = [\frac{\theta p}{w}]^{\frac{1}{1-\theta}} \tag{0.4}$$

- Clearly, $I^C < I^G$ for any θ, p, w, and α
- Let π^{*C} and π^{*G} be the optimal profits:

$$\pi^{*C} = (1-\alpha)pf(I^C) - wI^C$$

$$\pi^{*G} = (1-\beta)[pf(I^G) - wI^G] - F$$

Composition Scheme Model Continued 2

- Since cutoff for joining the Composition Scheme is based on revenue threshold, it depends on $pf(I)$.
- But p and f are fixed. So, the revenue threshold is decided by input I.
- Suppose the revenue threshold is I^*
- Assume: $I^* > I^G$. Small firm case. So, both I^C and I^G possible.
- **Case A**: $\pi^{*C} < \pi^{*G}$. Then firms continue to pay GST and I^G is used.
- **Case B**: $\pi^{*C} \geq \pi^{*G}$. Then firm chooses I^C over I^G.
- Since $I^C < I^G$, so, $f(I^C) < f(I^G)$. The jump occurs at $\pi^{*C} = \pi^{*G}$.
- The inefficiency is the lower level of output produced under the Composition Scheme.

Composition Scheme Model Continued 3

- Taking values $\theta = \frac{1}{2}$, $p = 1$, $w = 1$, $\beta = \frac{1}{2}$ and $\alpha = \frac{1}{4}$
- The above result can be obtained for $0.051 < F < 0.125$
- Inefficiency occurs due to the fixed cost F
- Inefficiency also occurs due to the Composition Scheme
- There is trade-off

Monopoly Set-up

- Consider a firm facing inverse demand curve $P(x)$, where x is the quantity of output sold by the firm.
- Following the arguments given in previous slides, the profits are:

$$\pi^C = (1-\alpha)P(f(l))f(l) - wl \tag{0.5}$$

$$\pi^G = (1-\beta)[P(f(l))f(l) - wl] - F \tag{0.6}$$

- $f(l)$ is the production function,
- w is the price of inputs and
- F is the fixed cost of GST compliance.

Monopoly 2

- The First Order Conditions (FOCs) are given by:

$$(1-\alpha)MR(x^C)f'(l^C) = w \tag{0.7}$$

$$MR(x^G)f'(l^G) = w \tag{0.8}$$

- Comparing the two FOCs, we get:

$$MR(x^C)f'(l^C) > MR(x^G)f'(l^G)$$

- $MR(x)f'(l)$ can be written as $A(l)$ where $A'(l) < 0$ as both MR and $f'(l)$ are decreasing in l.
- So, $A(l^C) > A(l^G)$ and hence, $l^C < l^G$
- Thus, the inefficiency remains even when we move to a monopoly setting.

Observations

- The inefficiency stems from fixed costs of GST compliance F and Composition Scheme
- Efficiency requires reducing of F
- In monopoly, the inefficiency is even higher as $MR(x)$ is downward sloping, while it is constant in the perfect competition case.