27/7/17
Thursday
1:17 pm

Revenge will be Taken
Abhijeet Sinha

Role of Public Finance

Syllabus → Stabilisation of supply
→ Allocation of resources
→ Distribution
→ Development

Other role → Coordination (Planning)
→ Regulation
→ Sustainable Development
→ Prevent Market Failure

In fact all part of Allocation

~~Govt Govt (Agency)~~

→

Q-1

Allocation function
→ For local Public goods
→ Issues
→ Free Riding
→ Principal to Charge
→ Externalities
→ Measuring Benefits Received
→ Voting acts as a substitute for Market Mechanism

Distribution function

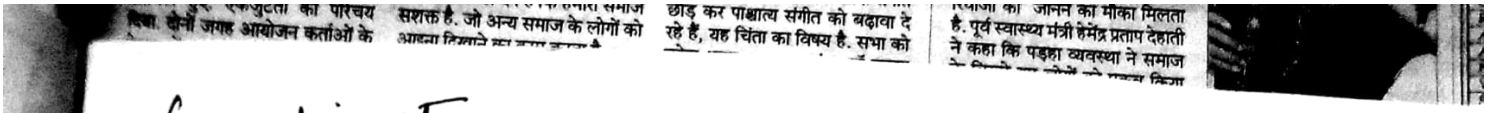
→ In Market mechanism → depends on Distribution of factor endowments and ownership of wealth.
→ Not fair
→ Welfare Economics
→ Issues
  → Principle
  → Redistribution has efficiency cost
  → How to find utility
→ Instruments
  → Tax
  → Subsidy or Tax-Transfer
  → Combination

Stabilisation function

→ → Employment
→ Inflation
→ ~~Ex~~. BoP
→ Growth

→ All 4 aim we saw in Intermediate

→ Instruments
  → Fiscal
  → Monetary
  → ~~Ex~~ Exchange Rate



सशक्त है. जो अन्य समाज के लोगों को

छोड़ कर पाश्चात्य संगीत को बढ़ावा दे रहे हैं, यह चिंता का विषय है. सभा को

है. पूर्व स्वास्थ्य मंत्री हेमेंद्र प्रताप देहाती ने कहा कि पड़हा व्यवस्था ने समाज

Coordination

→ Policies may be against the goals / reduced

→ eg. Distribution aim → Socialist → Hurts Allocation

→ Stabilisation aim via Fiscal Expenditure → Tax → Distribution hurt

→ Need, Minimisation of conflict necessary

→ Role of Voting

Ch-4

Allocation Role

→ In Private goods, allocation is not a problem because presence of Property Rights allows Excludability & limited / no externality does not lead to a free Rider Issue as Consumption is Rival in nature

→ In Public goods, Market failure due to 2 reasons :-

i) Non Rival

Consumption of 1 good by 1 individual (eg. ~~Defence~~ Road) doesn't hurt any other individuals (Roads without toll) ($\because MC = 0$)

→ ~~Hence, it leads to Free Rider issue~~

→ Also, even if we can introduce Excludability (say Toll or Jammers To Broadcast) it is not desirable, because $MC \approx 0$ and excludability leads to Efficiency costs ↓ not Pareto Optimal

Non-excludable and non-rivalria is not possible

ii) Non-Excludable

→ Here, Excludability is (may be) desired

→ But there is no Feasible / Cheap way of doing it

→ Eg. Too many people on a crowded road

→ May require large no. of volunteers / staffs → Difficult & Costly (Or, if audit is done is expensive again.)

→ Leads to Free Rides issue as

→ Consumption is not Contingent on Payment. Hence, people don't reveal their preferences in bidding

→ Thus, no effective Demand for goods

	Excludable	No
Rival	1	2
No	3	4

1, 2, 3, 4 can all be said as Social Good.

However, we generally take Public goods only as 3 & 4 as some form of Private can work in 2

Anyways

Lindahl Equilibrium

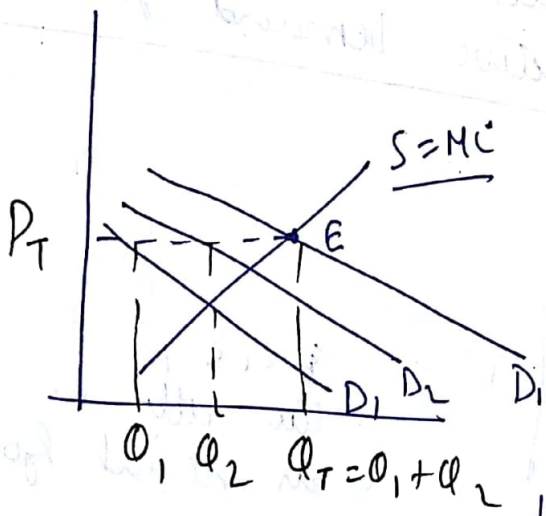
» Developed by
with i) Wicksteed
ii) Samuelson

Voluntary Preferen

Aim → Assuming Demand of each person is revealed, what would be the free Market price.

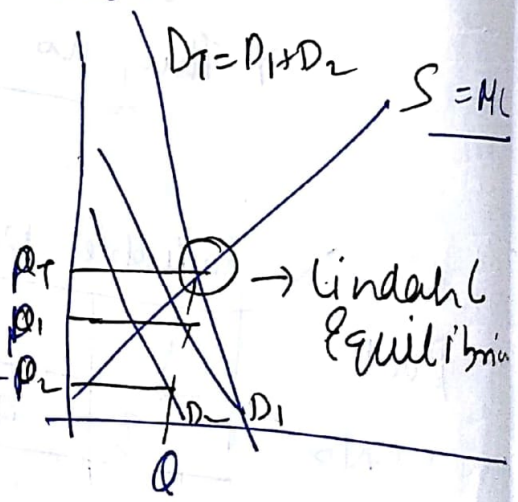
(However demand is not genuine → hence called Pseudo Demand)

Private good



1. We equate MC with Demand is Horizontally obtained by Horizontal addition (Sini, Price for all ran)
2. Each buys Different Q with ran P

Public good



Demand Vertical addition since Quantity for all ran due to Non-Rival nature
& Each

2. Each pays different Pd ran Q

3. In equilibrium, at P_T, MB derived by both individuals is same (Here same Price)

2. In equilibrium, Marginal Benefits derived are different
P_1 & P_2
(Sum of MB = MC)

Issues

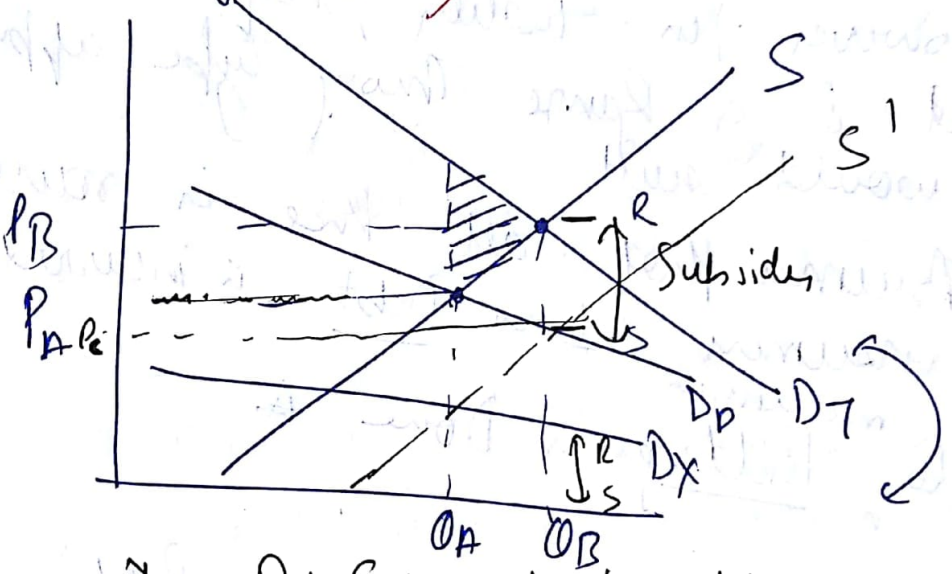
→ Non revealing
→ Free Riders
→ Assumes each other demand is given, however, in reality, they could guess it & a Game Theory type approach would result
→ Assumes that all Price is raised from consumers & no Debt is incurred.
→ No mechanism or Bidding is Done

To provide a Mechanism for Bidding, Voting is done. Issues:-
i) Political mechanism is imperfect and only approximates optimal budget choice
ii) Representative Democracy → problem further complicated as representative makes final choice & is subject to individual Biases & Lobbying.

Mix Goods

→ Neither fully private, nor Public
→ They have externalities but others benefits are internalised

External Benefits



D_X → External benefits (Obtained by vertical addition of all others utilities)

D_P → Private Benefits

D_T ⇒ Total Benefits by Vertical addition

In free Market mechanism, only internal Benefits would be internalised

and Q_A quantity of good would be produced.

However, Marginal Benefit of society are higher & lesser production leads to a Deadweight loss given by shaded area (Market is not going to Reach this because of free ride issue & who one would be willing to Reveal & Pay)

Hence, govt subsidy is required, either to Producer or to Consumer.

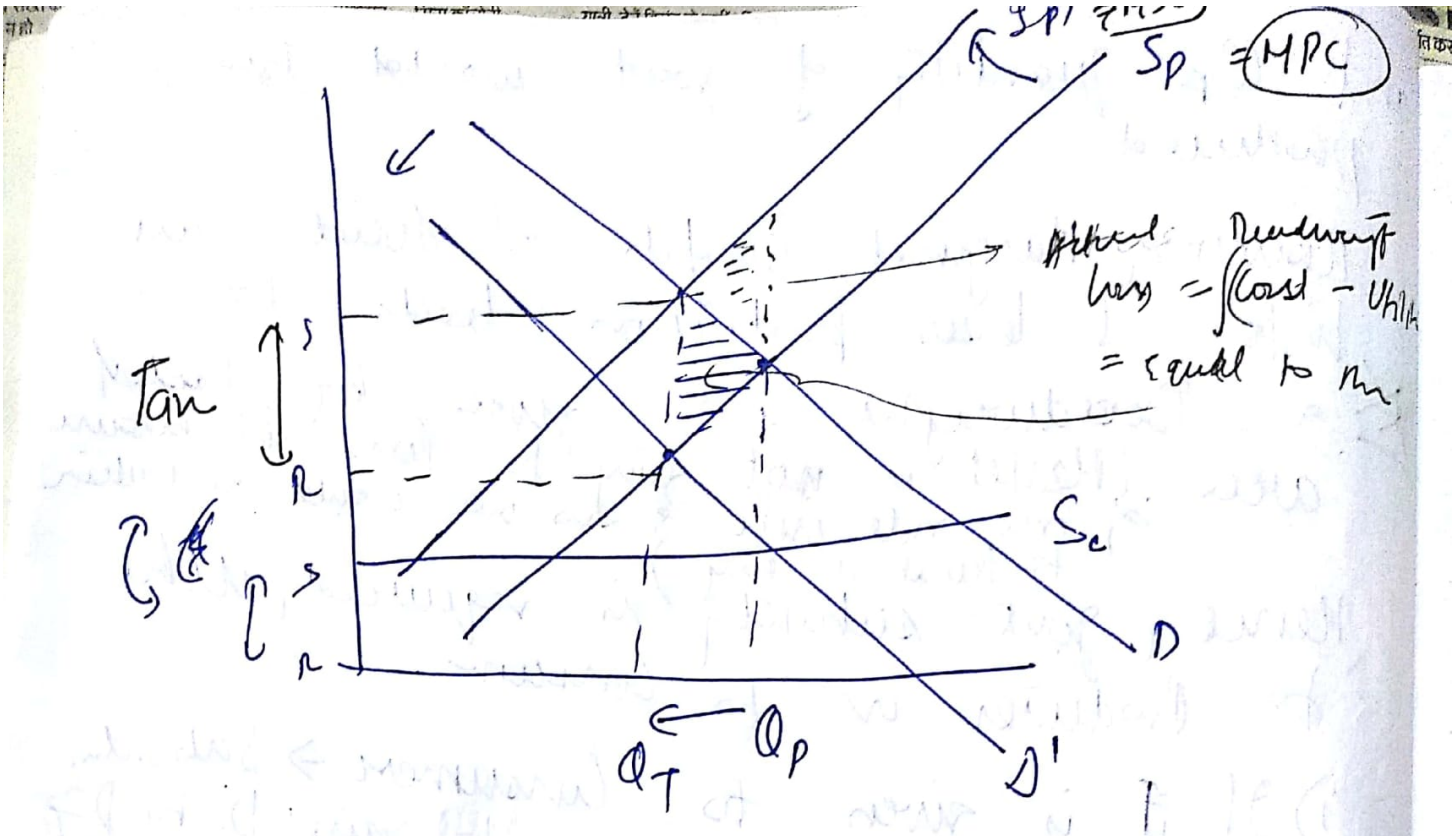
i) If it is given to Consumer → Subsidy = Rs in provided so to raise D to D_1 Consumer pays P_C. Govt pays $P_B - P_C$

ii) If to Producer, Subsidy = Rs is given to raise supply to S_1 Consumer pays P_C, govt provides Rs to that producer gets P_B.

External costs

Private Consumptions generate costs which are Not Internalised completely & society has to pay causing a deadweight loss.

Hence, a Tax is required.



In the presence of External Costs = S_e, market mechanism fails to ~~en~~ internalise and Excess Quantity of ~~Goods~~ Goods ($=Q_P$) > Socially Optimum Goods = Q_T is produced leading to a deadweight loss given by shaded area. (Excess of costs over Benefits → ~~ROTE~~)

To rectify, Tax is required ~~on~~ = RS

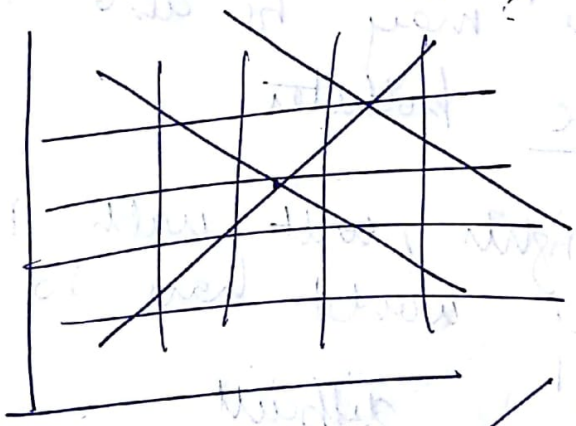
i) Producer → which raises Supply costs & shifts S to S_p'

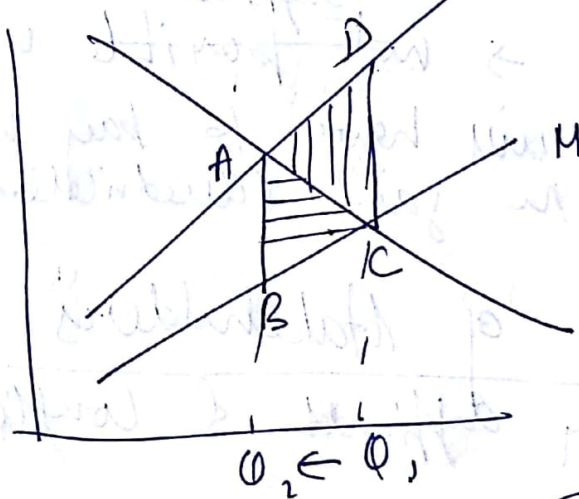
ii) Consum → which reduces Demand to D'

Issue ⇒ Costs of Subsidy & Tax
→ Utilities not known
→ Hence, Political Voting required but its own issues like only Approximate & Indirect
→ Another solution can be Bargaining

Bargaining → Coase
(Tax & Subsidy & Govt → Pigou)

Works in Negative Externalities are





Socially optimum solution → Q_2
but market produces Q_1
way out
Bargain
Loss of PS + CS = ABC
Gain to Consumer = ABC
Hence consumer may bargain

∴ Consumer gain > loss of welfare by P5 + G
(On this way to find the Deadweight loss in Pigou case)

Benefits
→ Costs of Tax saved & Externalities internalised

Costs → Reduce incentive to continue polluting in absence of
→ Bargaining has own costs Enforcement
→ End results may not be favourable
→ Depends on who has property rights are with
eg. here Property rights with Polluter & People may be able to bribe polluter

If Property rights ~~with~~ with People, then factory would have to bribe
(although → ~~not feasible~~ difficult in this because will have to pay more than its gain (Quadrilateral – B))

→ If large no. of stakeholders bargaining very difficult & conflicting.

As John Kenneth Galbraith showed, Capitalism made a country richer in Private goods but poorer in Public goods, such as Public Health/ Environment

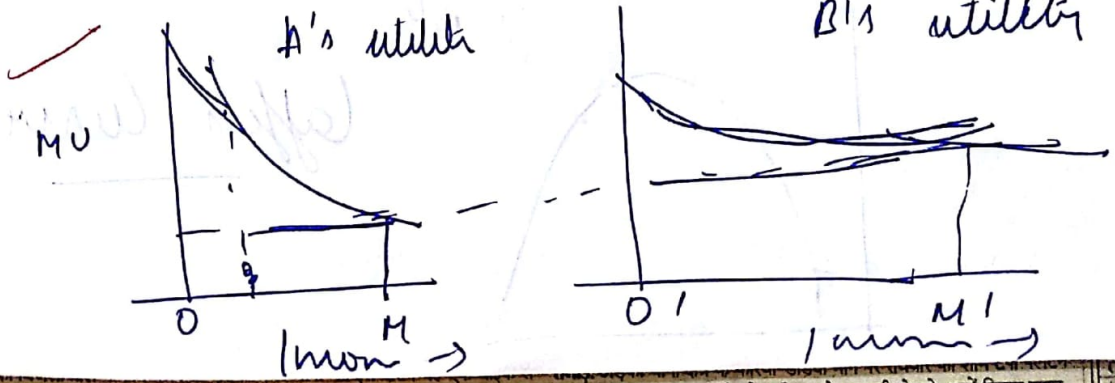
Distribution (Link it with Tax Principle)

Goals of govt / state (economy may be varied)

Subsidy to Poor, Benefits Reservation etc

1. Endowment Based Criteria → Hobbes, Locke.
   - → Keep what you earn
   - → " " " in Competitive Market
   - → " " " as wages
   - → " " " could earn in a competitive market had position been equal at start → Rawls.

2. Utilitarianism → Benthm
   - → Maximise total equity
   - → If Utility is to maximised, then the MU derived from all persons of the last unit of money should be same
   (Else always possible to redistribute to that person who gets more utility to maximise total)



Hence, B's ~~ut~~ Income is more because he ~~utili~~ derives greater utility.

~~Ev.~~

Issue → Redistribution has efficiency costs & reduces total available quantity of 'Pie'

3. Egalitarian (~~will study~~

→ Same Total utility

→ Maximising the lowest Incom. → Rawl

→ Same Income.

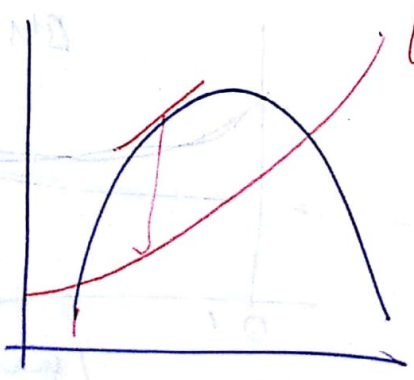
Issue → Costs of redistributi.

4. Min

→ ~~Both~~ min of these 3 criteria.

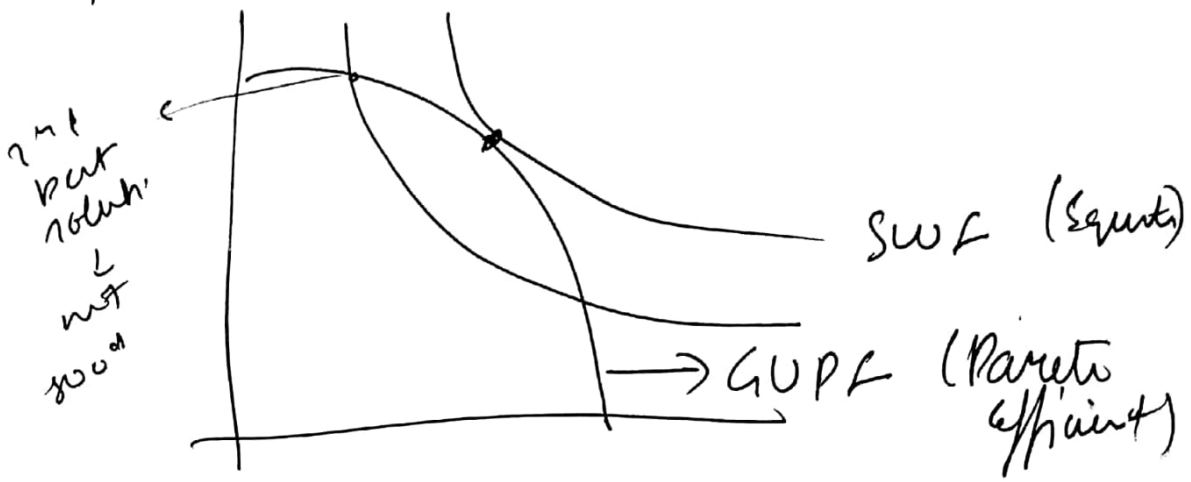
Limits to Redistribution

As Redistribution ↑, Efficiency ↓



Laffer's Curve

Hence, a balance is needed.



Public Expenditure

Growth

→ Continental Shift

Wagners Rule

→ Law of Rising Public Expenditure

→ Public Expenditure rises with rise in ↑ due to Social & Political Calls for Progress

→ Reviews

→ Data from OECD countries has indeed confirmed this trend (Musgrave)

→ Show Data from India
→ 1950 → 10% of GDP ⇒ 17%. now

→ Also, Public Expenditure

- On Public Goods & Service
- Transfer Payments

→ Both have risen

Reasons

→ Rise of PCY

→ As PCY increases, high elasticity of expenditure on luxury goods leads to greater share of such goods (Engels law)

→ Many Public goods like Higher Education, Health facilities, Space Mission, More Tech Capable/Defence quality

→ Population

→ With more people, ~~pro~~ more provisioning of social goods

→ Change in ~~#~~ popn cohort

→ More old age → social security (Japan)

→ Urbanisation

→ Leads to greater stress on existing ~~po~~ infrastructure, Pollution, etc

→ Greater Infra expenditure ~~of~~ also due to Urban Bias

→ Availability of Tax Handle
  → ~~As~~ institutionalisation of firms & individuals into formal economy
  → Better accounting practises

→ Rise of Prices
  → Empirically, rise has been more for Public goods
  → Possibly became less receptive to Technological change (eg. Higher education)

→ Other Possible reasons
  → Specialisation of govt (eg. Police)
  Barro → → More populism → more subsidy
  → More tendency to raise debt

→ Inefficiency
  → Has been written in another way as Wagners Squared Theorem which says Divergence between Govt Expenditure & Govt Output

  → Reasons
    → DUP (Directly Unproductive Activities)
      → eg. Leakage / Rent seeking
      → Bhagwati & Krueger
      → Leads to GDP in favour of Declining sectors

→ X efficiency

→ By Leibenstein

→ Characteristics influencing like Overstaffing, Rigid Rules, Absence of Incentives & distinctive mechanism

→ Baumol Cost Disease

→ Wage higher than Productivity of govt. officers.

(Also called wagner Law) → Rising Expenditure on Public Services

Wiseman Peacock Hypothesis

Govt expenditure does not increase smoothly, but increases in jerks, and step like manner as response to Disturbance.

Disturbance (war)

↓

Displacement effect → More Expenditure

↓

Inspection effect → Realisation that tax inadequate

↓ Tax ↑

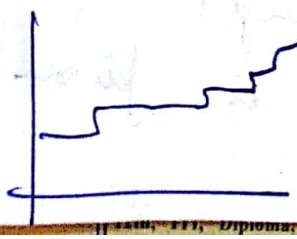
Tax Tolerance

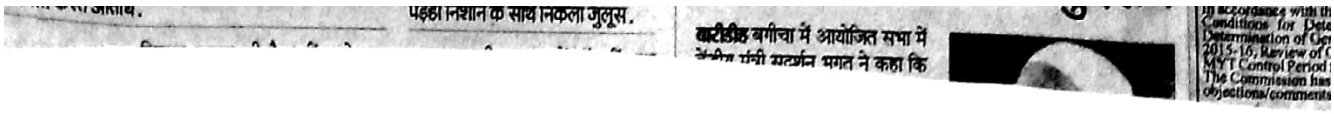
↓

New round of disturb

DDIT

Issue → Empirically proven.





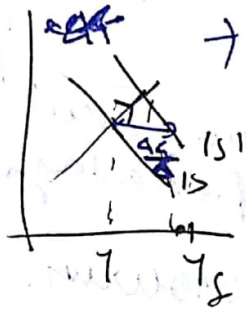
Canons of Expenditure

BESS

1. Benefit → Public Expenditure should be done in view of expected benefit out of it
   → Test is Maximum Social Advantage.
2. Economy → No wastage of resources.
3. Surplus → Preferably no Budget Deficit
4. Sanction → Only that expenditure which is sanctioned / approved.

Effects of Public Expenditure

→ Economic Stabilization role
  → Employment, Inflation, Anti cyclical
  → However Issues in use in Developing Countries
    → Rigidities
    → Crude Problems of Keynesian multiplies in Developing
    → And because of inelastic imports & export ~~or tax~~ low restrictions. Hence, additional custom duty only have restri-



→ Production Role (Development)
  → ~~Short~~
  → Social Overheads
  → Infra
  → Crowds In
    → Use Unbalanced Growth Strategy & I induced model.

See answer 2016

→ Distribution

→ Efficiency vs Distribution

⇒ → High Tax / Subsidy

→ Deadweight Loss

→ Income – leisure, Investment

→ Savings

1. 2. 3. 4. +ve → R&D & E. (spending in)

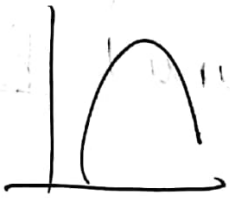
* Vimani (not) subsidies have a –ve effect on Growth

→ Here, Distribution aim hurts Efficiency

→ Similarly, Transfer Payments to Poor → Move in C than S → Capital formation ↓ (S ↓) ∴ Growth ↓

Entrepreneur side.

→ Whereas, more Efficiency → Distribution Gujarat



Inequality ↑ & ↓

→ Allocate ↑ Known
→ Land good
→ Entrepreneur

~~Make with MSP & Govt → How to allocate project → ₹ 31~~

Principle of Maximum Social Advantage

(Older Model)

Aim → Find ideal size of govt expenditure.

Assumption

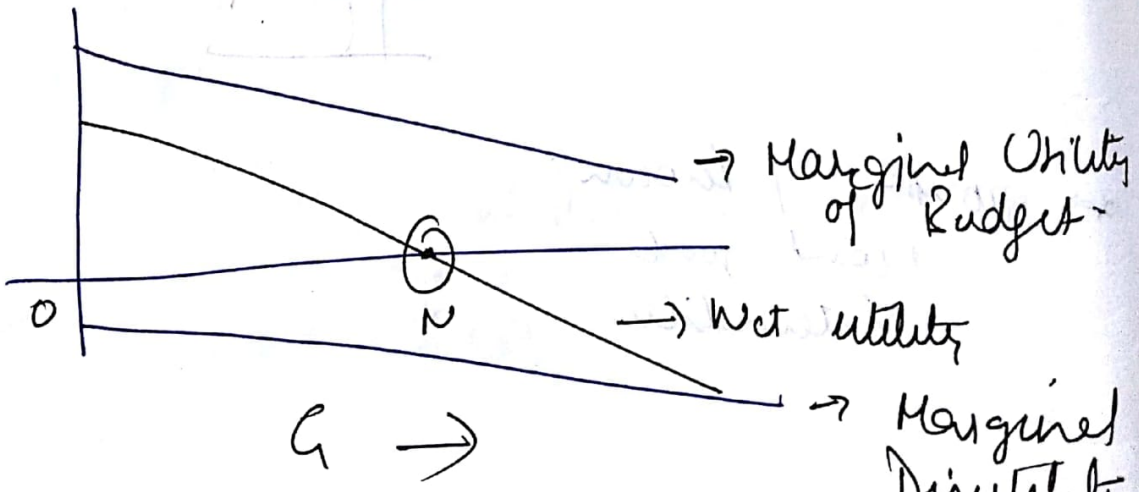
→ State is external to economy

→ Tax causes Disutility to ~~people~~ economy which increases as size of Tax ↑

→ Revenue Expenditure injects resources back to Economy & increases utility. However, utility rises at a declining rate.

→ Balanced Budget ∴ No Debt

Model



Ideal size of Budget = ON

Criticism

→ Dalton
- Assumes all Expenditures have declining utility. But, this is not true for some Expenditures like Infra which Crowds in I
- Assume all Tax as harmful to economy. But, Taxes on Sin goods (drugs, alcohol) is necessary for social welfare.

→ Assumes govt is external to economy

→ Assumes Balanced Budget & no Debt is raised

→ Absurd results → It may give a result that ideal size of govt is 0 if all taxes are take to be bad

→ Does not Include Market failures & how G is needed to correct it

→ Does not include the non-tangible benefits of govt → eg Distribution, social goods allocation, → Security, safety etc.

Hick's Test of ~~Maximum Social Adv~~

whether Public Policy leads to Net Social Benefit or not.

~~→ Beneficial if it is~~

2 Criterion

→ Production Optimum

→ Condition where it is not possible to increase production by reallocation of resources from 1 sector to another.

(Pareto version of total Hicks test)

→ Utility → not given → but Pareto probably

Issues

→ Same as Pareto

Similarly Dalton's Test ~~too~~

→ Objective Tests

→ Based on Role of

i) Preserving welfare of society

→ Internal & External disruption

ii) Economic Welfare

a) Efficiency

b) Equity

How to Allocate Projects

→ Based on Hicks criteria

~~→ Optimal ~~

Case 1

→ Divisible Projects but fixed Budget

→ When Marginal Benefits from cost of spent on each project is same.

→ Divisible & Variable Budget

→ Marginal Benefits equal of cost

→ And must be equal to Marginal Costs due to Tax

→ Principle of Maximum Social Advantage

Case 2

Lumpy Project & ~~Variable~~ fixed Budget

→ Can have different forms till

→ Rank Projects & select the projects (due to social advantage) which are within budget

→ Try and minimise leftover.

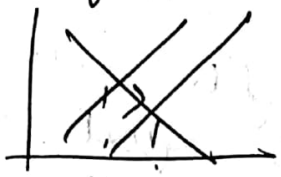
Lumpy & variable Budget

→ Equate MSB = MSB as well

Debt

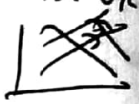
2 types of Govt financing

1. Debt financing of Budget deficit
   → It shifts rightward without any change in LM

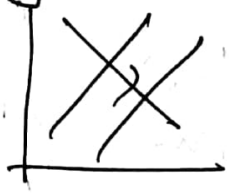


→ Issue → wealth effect
→ Inflation (not like earlier)
→ Ricardian Equi.
→ Crowding out

LM also shifts in case



2. Money financing of Budget Deficit
   → By Printing money
   →



LM shifts
↓ r
↑ Y
(wonder why)

Issue → No crowding out but Inflation.
↓ Inflation → Tax.

→ The govt. need to transfer payment, subsidies, expenditure

Debt

See 6m → Fiscal Consolidation → Rubber, Balance That Syndrom. → Railway → MULTIPLIER

Benefits → Provides Extra ~~Fiscal~~ Financial Resources with zout

→ It helps to tackle emergencies like Wars & Crises. Here Tax will have limited utility because Tax accumulation takes time

→ Limitation of Tax → distortion, Laffer curve,

→ Myrdal → Tax Handle available with Developing countries are limited. Here, Deficit financing is used for Capital Formation

Structuralist Theory

→ Domar → Accelerator → I↑ ⇒ Supply side (Prod) ↑

→ Unlike Taxes, & unlike Private Sector, Debt can be sustained forever. (if within ↑ Threshold limit)

→ Induces Forced savings as P↑ (Real Balance effect)

→ Inflation Tax → Similarly Tax also up due to ↑ due to Deficit financing

(Here Tax due to Higher Nominal Value as P↑)

(Here, G can be self financing)

Effectiveness for Developing Countries.

→ Keynes said that Deficit financing will not be ineffective in Developing Countries because of structural rigidities

Reason of URU Rao
↑ Counter → Counter reason of URU Rao.

→ Lewis (Classical)
→ Unlike the traditional belief that Deficit financing creates Inflation ($\uparrow_L$), Lewis says that inflation may exist in SR, but if ~~it~~ ~~used for~~ Capital goods are used to create Consumer goods, then S↑ & P↓ stabilises. (Neo Profits (Lewis → surplus labour mode) & ~~x~~ increasing savings kills inflation.

→ Fisher
→ Non-inflationary deficit financing
→ Amount of money that govt can obtain from Money Printing (Ca% of GDP) without causing inflation depends on :-
i) Real GDP growth rate (ΔY)
ii) Reserve money as a share of GDP ($\frac{H}{GDP}$)
iii) Elasticity of Y to Real Balance

→ Then, $\pi = \frac{H}{GDP} \times \Delta Y \times e$ (In line with MV = PY)

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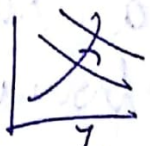
Cons of Debt

1. ⇒ Inflation

Reasons

→ If Ms ↑

1. → AD ↑ (Y_0)
   → Used to create capital goods
2. which have high gestation period
3. → Stimulates C due to wealth effect
   → Credit creation rises by banks
4. since their assets rise due to acquiring of T bills.



Counter

→ Lewis
→ Fischer.
→ In Depression → no inflation.
→ Domar → Supply side

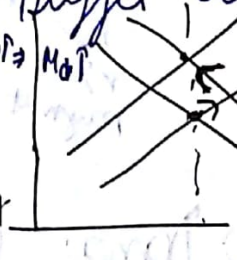
Overall diagram

2. Inequality (Patinkin & Friedman)

→ Wealth effect as bond holders assets rise while poor suffer, due to Inflation

Empirically weak.

Also in LR ⇒ WP ⇒ ↓M ⇒ LM shifts up ⇒ LM'



In LR, no effect due to ↓Y

3. Crowding Out

→ As high Y & P ⇒ Md ↑ ⇒ r ↑. T ⇒ I ↓

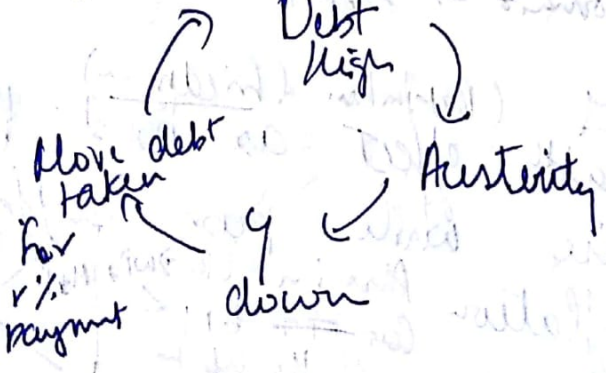
→ However crowding out depends on Elasticity of IS & LM

4. Rational Expectation (Called Ricardian Equivalence) — Modigliani & Friedman

→ Based on life cycle Hypothesis of consumption.
→ Its Deficit financing is used / People forlook a rising Tax demand & hence lower their Consumption (said by Barro also) nullifying increase in G.

5. Debt Trap

→ Unstable cycle where Debt as a share of GDP rises leading to a Explosive situation & finally Default on Debt (Greece 2015 / Argentina)



→ Domar Condition — Rajan → Brazil

→ Debt trap is sustainable if r < growth.
→ Income rises & part of it can be used to retire debt

4 country does not fall into Debt trap.

→ Says, this works even at Y_f because

∴ Debt → AD ↑ → By ACCELERATOR principle I ↑ which has both Supply and demand side effect & equilibrium is restored.

(crowding in)

Can also be explained with Hirshman unbalanced

$\frac{\Delta I}{I} = \infty$

6. Political Dependency due to Debt

7. Tax Burden on Debt service (Later)

→ Create Distortion → Deadweight loss

→ Counter →
- → ↑ tax
- → Y ↑

] → Self financing at least a part of G covered.

→ Domar condition

8. Intergenerational equity

If Debt raised Domestically

→ Then the question is where Debt is coming from

i) If from Savings then Future consumption reduced (Assuming Govt is entirely to crowd)

ii) If coming from consumption then Present consumption ↓

If Debt from foreign
→ Then resources not diverted from current C / Savings
→ But, cost is Paid in terms of ~~GDP~~ foreigners receiving a share of GDP

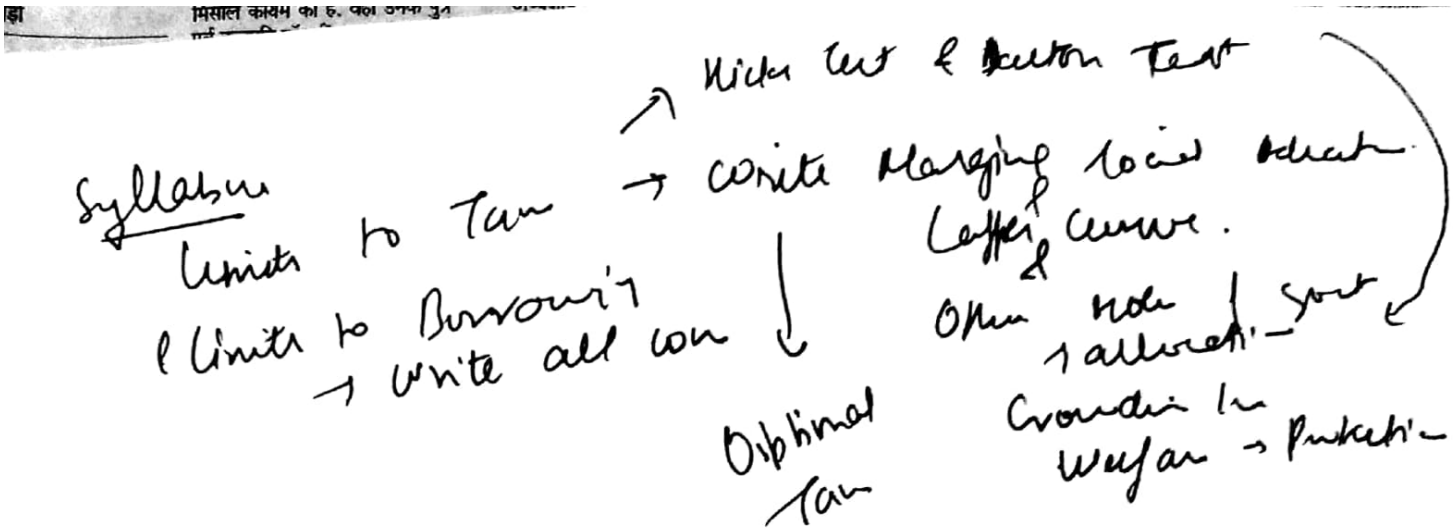
Additional Effect
→ Rational Expectation may set in (may because fulfilment of Domar Condition is necessary) of expectation of future Tax reduce Current Consumption.

Counter
→ Govt expenditure for Capital formation & Crowding in which benefits future
→ Hence, a Thumb rule is Capital formation out of Debt Current " " " Taxes

→ Golden Rule
→ No RD FD for Capital

9. Ratings & FDI

10. Monetary Manoeuvrability & e/p of Monetary financing



Revenue

Tax

→ No returns
→ No Quid Pro Quo
→ Participation mandated
→ Only state subjects
→ Distortions → Bigger
→ S/C ↓
→ Counter-Inflationary
→ No Debt Trap
→ No Crowding Out
→ Progressive
→ No Debt Trap
→ ~~Evil~~

Borrowing

→ Returns
→ Quid Pro Quo.
→ Participation voluntary
→ Foreigners too
→ No / Limited Distortion
→ Consumption / Investment
→ Inflationary
→ May cause Debt Trap
→ ~~Evil~~ Trap
→ Crowding out
→ Regressive (Wealth Effect)
→ Debt Trap

Other cons of Tax → Tax Handle
→ Limit → Laffer.
→ Only domestic
→ Can't be collected immediately

Equivalence Between Taxes

→ Symbols → T_L → Tax on labour
T_K → " " Capital (Capital Gains)
→ T_X → Commodity Tax on X
T_Y → " " " Y
→ T → Income Tax

→ Assumption: Good X & Y only due to 2 factors

Equivalence

→ T_x = T_{Lx} + T_{Kx} $\quad T_y = T_{Ly} + T_{Ky}$

→ $T = T_L + T_K$

→ $T = T_x + T_y$ (if no saving)

→ $T = T$

→ In PC, it does not matter where Tax is imposed as Shifting of Tax Incidence is complete here → both in commodity as well as in factor market

Canons of a Good Tax

ECCE $\quad$ 4 ADs

↓

Adam Smith

E → Equality (4)

→ Based on ability to pay

→ Though modern system make a distinction & call for Progressive taxation

C → Convenience

→ Form that is convenient to Taxpayer Single Page IT return

C → Certainty
→ Manner of Tax should not be arbitary (Tax Terrorism)
→ Else may cause corruption

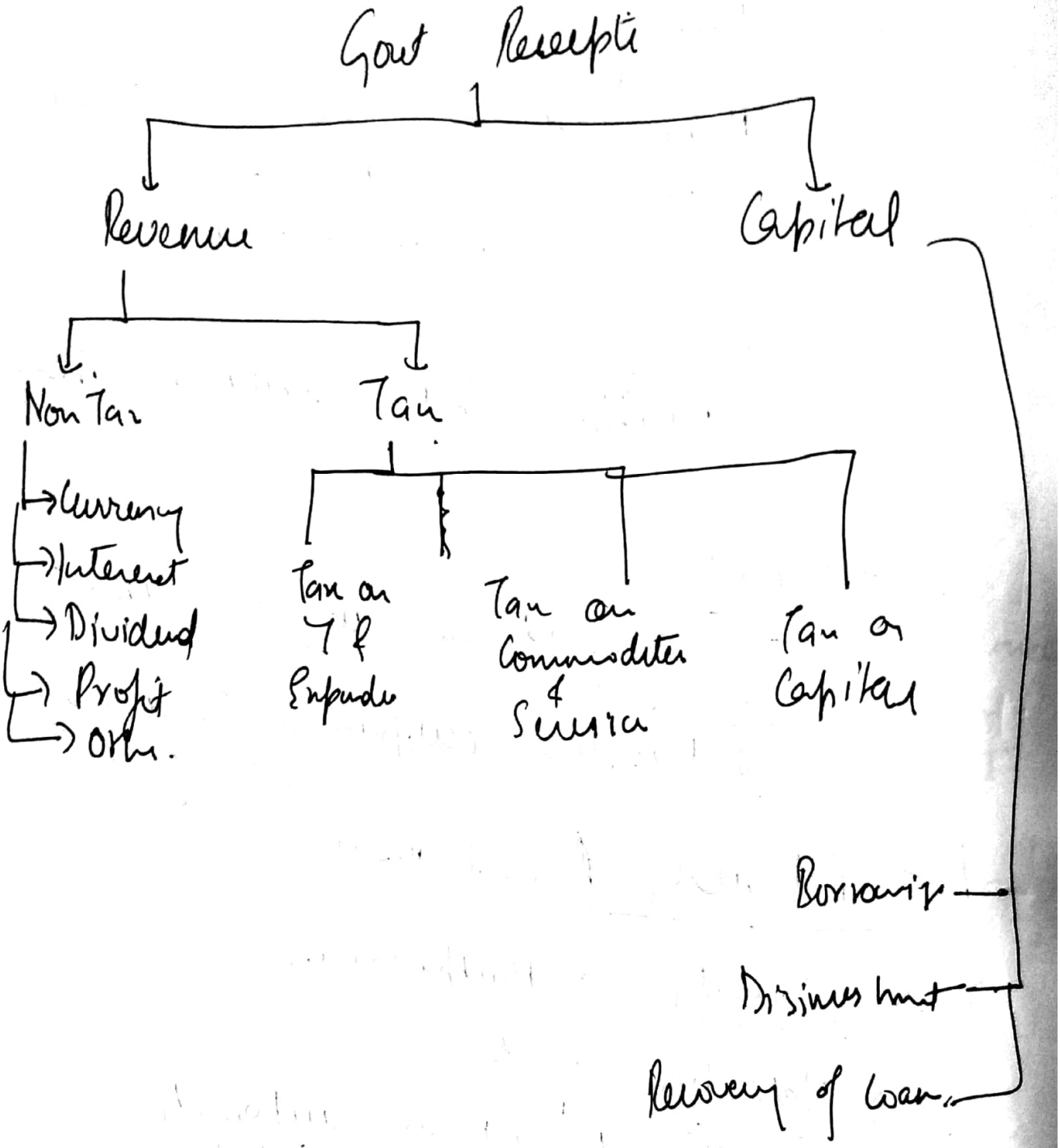
E → Economy
→ Collection Cost should be min.

G → Growth
→ Tax should be an instrument of growth
→ Flexible system & encourage Savings.

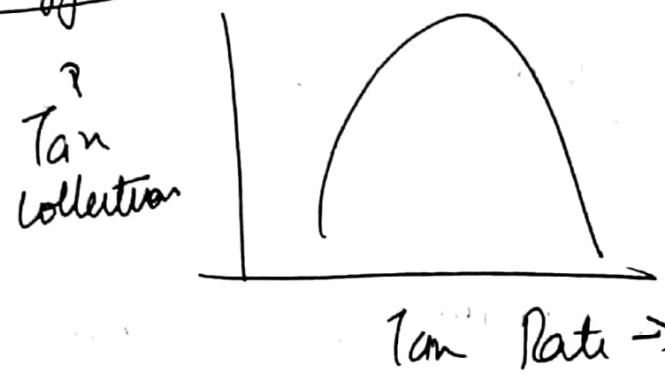
A → Adequacy of fixed resource.

D → Diversity → Multiple source.

S → Stability → A
→ Should act as automatic stabilizer.



Laffer Curve



Reasons

→ Arithmetic effect
  → As rate ↑, tax collection would ↑ assuming base rate constant
  → The relation depends on Elasticity of Tax to rate

$$\epsilon = \frac{\frac{\Delta T}{T}}{\frac{\Delta r}{r}}$$

→ Base Effect / Economic Effect

Bayoumy & Tax ⇒ As rate ↑, base reduces due to deadweight loss

$= \frac{\frac{\Delta T}{T}}{\frac{\Delta B}{B}}$ *(Base) — (Base) refers to the describ- the object on which tax liability is measured.

→ So Initially Arithmetic effect >
  Late Base effect >

Vindication

→ India → later (Peak rate / Marginal rate) ↓ from 97.5% to about 30%.

→ led to massive increase in Tax, 10% to 17%.

Criticisms

→ Bell shape not necessary; can assume other shapes by the logic

→ Based on assumption that economy responds quickly to change

→ Also depends on institutional factors:
- i) Effectiveness of Tax authorities
- ii) Efficiency of Expenditure (People pay Taxes based on Rev)

→ At, r = 100%, Tax would be 0 only if
- i) People don't work
- ii) All Y is consumed → Neither true

→ Inter-country variation

Taxable Capacity (TC)

→ How much maximum Tax that can be collected.

→ Factors

SR → Income → Y↑ ⇒ TC↑ (More in Tax Slab)

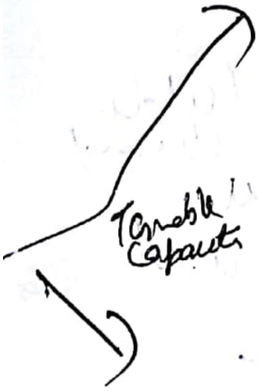
→ Inequality → ∝

→ Reasons

i) More people above subsistence level & with Tax slab

ii) Tax Handles can be easily applied

iii) MU falls for rich & lesser resistance to pay



&

LR → Convenience

→ War / Emergencies (Wiseman - Peacock)

→ Lesser resistance.

- LR

→ If expenditure is creating social overheads, → lesser resistance

→ Economic Reforms to reduce Deadweight loss.

Equity of Tax system

2 chief approaches :-

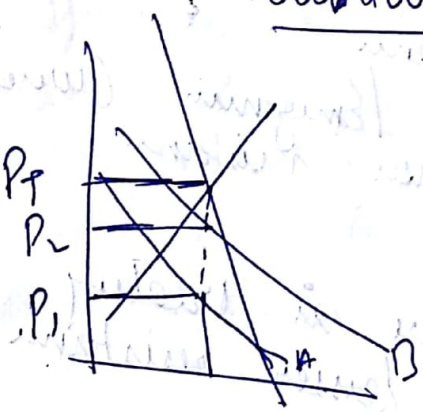
i) Benefits Received ↓ Adam Smith. Quid Pro Quo

ii) Ability to Pay ↓ Mills, Say (i) Based on Socio-Political → wages → SWF

Benefits Received → Should be tied to Public Expenditure & Benefits derived out of it

I Model → Lindahl Equilibrium based on Voluntary Revealing Preference

Musgrave doesn't use it in Benefits Received. So be careful



$P_T = P_1 + P_2$

A should pay P_1

B → P_2

Issues

→ Do not exactly know individual Benefits Derived

→ Possibility of free Riding

→ Assumes the current Distribution as given & makes no attempt

to modify it.

→ Assumes that each other's demands are given. In reality, ~~Go~~ taxpayers would assess each other pattern & based on that would reveal their preferences

→ In actual, done via voting mechanism

→ It assumes information ~~s~~ symmetry. However, individuals may choose not to take benefits of / may not know about benefits of a necessary program → say Polio campaign & would not take part in this

→ Reduces govt to a commercial organisation of preference revelation

[if not ~~if~~

Application of Benefits Received

1. A General Benefit Tax

→ Each individual pays tax in line with demand for service.

→ ~~Static~~ Under assumption of Not Inferior goods, as Y rises,

2. → Based on Elasticity approach

Demand for a product would rise

$$\rightarrow \therefore \frac{\frac{\Delta Q}{Q}}{\frac{\Delta y}{y}} = e_y$$

Also, $\frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = e_p$

$$\therefore \frac{e_y}{e_p} = \frac{\frac{\Delta P}{P}}{\frac{\Delta y}{y}}$$

Since, Tax same change in price

∴ Elasticity of Tax to Income depends on $\frac{e_y}{e_p}$ & e_p

Now, if $\frac{e_y}{e_p} > 1$ Then Tax is progressive

Since, change in $ Income creates greater change in Tax

$\frac{e_y}{e_p} = 1 \rightarrow$ Proportional

$\frac{e_y}{e_p} < 1 \rightarrow$ Regressive

Thus, under this approach, govt depends on Behavioural choice of people.

+ that determines the progressivity of tax. Govt does not have a tax handle like in the current system which is based more on ability to pay

2. Other way in which Benefits Received can be applied is, a Specific Benefit Tax
   → where tax is applied on a specific good
   → eg. Toll tax on road
   → Issue → would work only if goods are non-rival

3. Tax in lieu of charge
   → Tax is levied on a Complementary Product, when levying charges can be difficult
   → eg. Tax on Diesel, instead of Toll on Road.

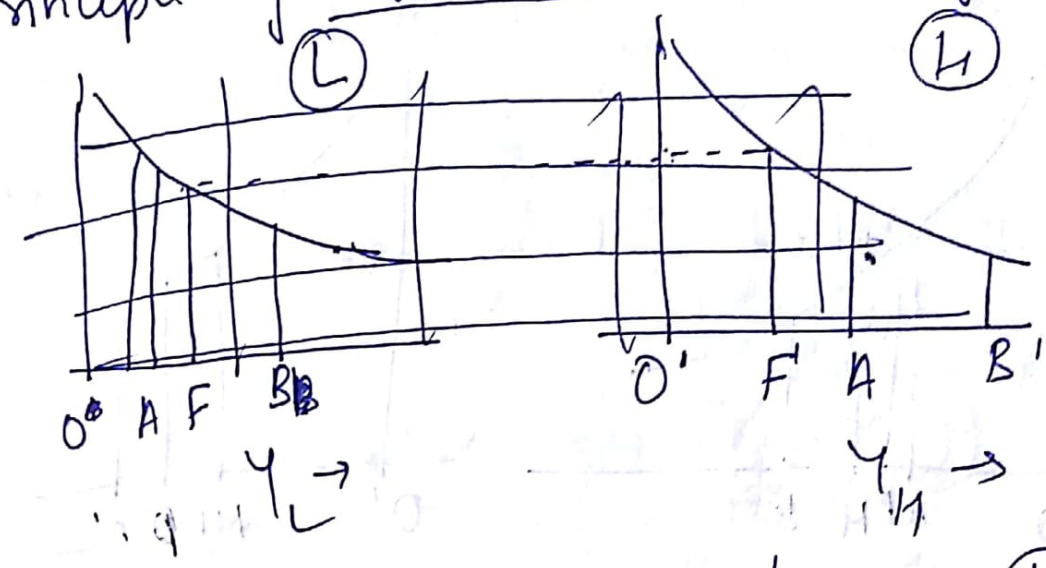
Ability To Pay

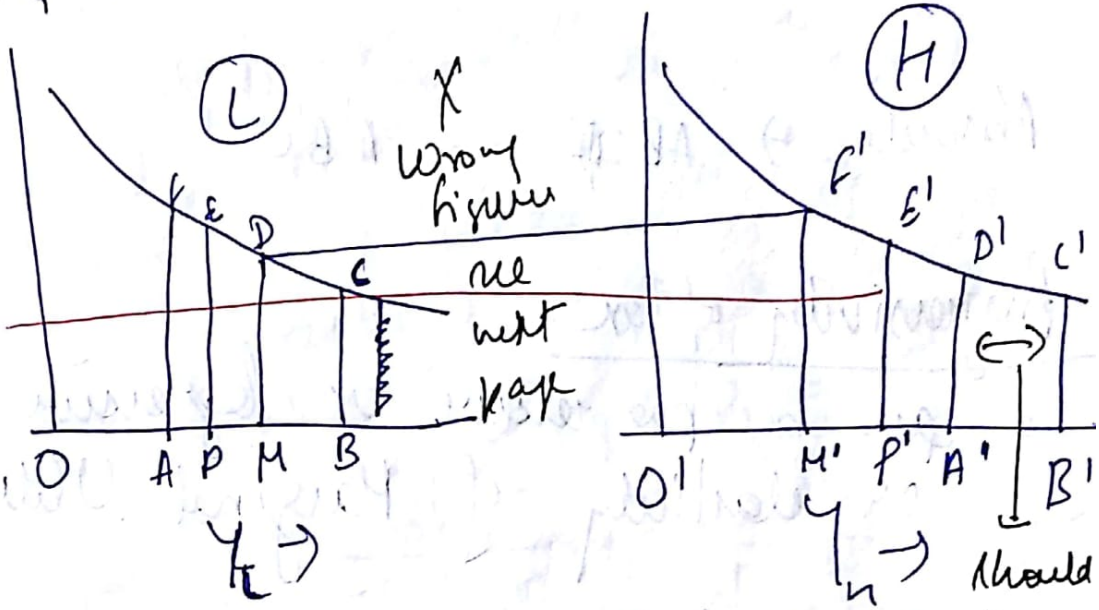
→ Say, Rousseau, Mills
→ Views Tax without Quid Pro Quo
→ Calls for Both Horizontal Equity & Horizontal Equity
→ This may be on any 1 of numerous ~~ways~~ basis of Base
→ Income, C, W

Vertical Equity & Subjective Approach

→ This is based on Disutilities suffered by a person.
→ Can be based on numerous criteria
→ Assumptions to all
→ Utility can be measured Cardinally
→ Everyone's utility preference is same
→ For Total Tax, how to collected
~~→ For each Tax, we'll assume~~
~~Utility function~~
~~i) Convex ii) Declining~~
→ 2 individuals → L & H
Lower Y (OL) Higher Y (OH)

i) Principle of Equal Absolute Sacrifice





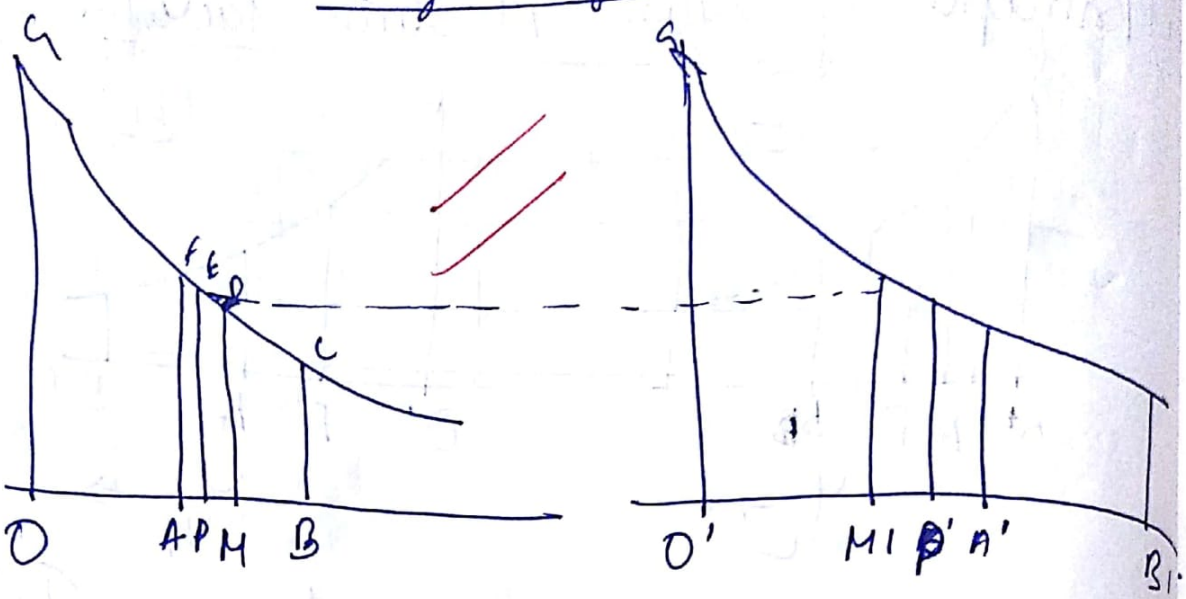
Equal Absolute Sacrifice

→ The disutility served by each individual is same due to tax.

→ Thus, Y of L reduces to OA & Income of H reduces to OA' such that $T = AB + A'D$

And, $ABCF = A'B'C'D'$

Other figures



Absolute → ABCD = A'B'C'D'

Progressivity of Tax

Can be progressive or regressive based on elasticity of Marginal Utility

Mathematically. Absolute Equal Sacrifice

Assuming small area & Approximately with rectangle:

$$(MU)_{Pay} \times T_{Pay} = (MU_{Pay} - \Delta MU) \times (T_{Pay} + \Delta T)$$

$\downarrow$ $\uparrow T \therefore MU \downarrow$

$$\Rightarrow MU \cdot T = MU \cdot T - T \cdot \Delta MU + MU \cdot \Delta T$$

$$\Rightarrow \frac{\Delta MU}{MU} = \frac{\Delta T}{T} \rightarrow \text{Identity}$$

Progressivity

Then, $(\eta) = \frac{\Delta T}{T} / \frac{\Delta y}{y}$ can be rewritten as.

$n = \frac{\Delta MU / MU}{\Delta Y / Y}$ → or elasticity of the MU curve

Hence, ~~Regressive Tax~~ ⇒ Progressive Tax

If MU were constant, both rich & poor would have paid same ~~tax~~ & Hence Regressive

Equal Proportional ~~Service~~ Sacrifice

→ Same proportional decline in Tax rates

⇒ ⇒ Income ↓ & reduces to BP

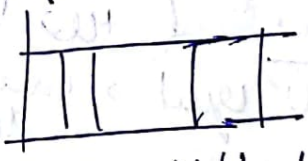
& M to B'P'

such that $RP + B'P' = T$

& $\frac{BPCE}{BCGO} = \frac{B'P'C'E'}{B'C'G'O}$

Mathematically

~~Poor~~ Rich



Under a constant MU law.

$$\frac{MU_R \times \Delta Y_R}{MU_R \times Y_R} = \frac{MU_H \times \Delta Y_H}{MU_H \times Y_H}$$

or $\frac{T_L}{Y_L} = \frac{T_H}{Y_H}$ → Hence, Tax will always be proportional

If MU ↓ then.

$\frac{MU_{Initial}}{MU_{Final}} < \frac{MU_{Initial}}{MU_{Final}}$

∴ Tax will always be Progressive

Equi Marginal ~~Tax~~ Sacrifice

Both reach same income & utility level = OM = O'M'

Also, it is an efficient system that minimises the overall aggregate sacrifice. e.g. If any 1 MU is one in less, then always possible to take more tax from rest (Pareto's Principle MU - mu)

Always Progressive - & reach same level

If MU equal → then amount allocation can't be determined

Observation

→ Equi Marginal Sacrifice is most efficient from allocation perspective & is most equitable.

→ Tax proportional > Absolute

Cons

Assumption → Tax utility
→ U known
→ Total tax known in advance.
↓
Equi Marginal sacrifice theorem

Ability to Pay → Objective Approach

Considers Question → Which Objective Base of Taxation
→ C or Y or W or anything else

Income
→ Has been generally used (Y tax)
should ideally cover
i) Money Y → W, r, Salary, Dividend
ii) Imputed Y → Rent
iii) Appreciation in Asset value

Benefit → Progressive

Con → Taxes savings / Capital formation

Tax to labour → 2 individuals with same Y can have :-
→ Different utility. (Say different no. of dependents). ∴ Ability to pay differ.
→ Wealth directs Purchasing Power.

→ Tax handles to tax Y tax may be missing esp in Developing countries (Musgrave). Instead Tax on Capital

Consumption

Benefit → No Tax on saving, hence allows Capital formation

Gives better horizontal equity (ROTE)

→ Advocated thus by ~~Baumol~~ Kaldor

→ Easier to collect

Con → Regressive

→ Y = C+S. If all C is ~~consumed~~ by wages & S by π.

Wealth

→ Provides for Real Purchasing Power

Benefit & security & affluence

→ Thus, Progressive

Con → Taxes Capital Formation (Counter of Consumption) Y = C+S

Ideally, both Consumption as well as Y/W

Utility

→ (Feldstein) Utility Criteria of Horizontal Equity

→ Conditions - ②

1. Tax should not alter utility ordering. If someone more utility

दो अलग-अलग स्थानों पर

(Future) before, the contents after Tax.
2. On same utility before → After too

~~Agreement~~ Application

→ I tax ⇒ ! (We can say same about C tax & U tax)

→ Doesn't satisfy
→ Say 2 persons
i) 1. materialistic (Maybe not so much about C tax)
ii) 2nd spiritual → same utility before.
→ Then I tax would lead to 2nd having more utility afterward.

→ It is just the new Taxes that alter the Horizontal Equity. Old Tax will ~~keep~~ satisfy both criteria
Then. Only Good Tax is Old Tax.

Tax Evasion

→ Traditional simple

If Penalty × Probability of getting caught < Gain due to Evasion.

Then Evasion.

→ However, ignores Psychic cost (Conscience) & ignores risk aversion (different people have different degree) & ease of Evading (non-jobs case)

How to formulate Tax policy

→ Using SWF approach

→ If Evaders welfare / Criminal welfare included → Then evasion may be justified a good

→ If Not → rule of Punishment But Libertarian SWF → had

→ ∴ Middle path

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Tax Incidence

- Statutory Incidence → As intended
- Economic " → Final result after shifting of Tax

- Absolute Incidence
  → When one tax is ~~[illegible]~~ added / deleted / modified, without any change in other taxes → leads to large Deadweight loss
- Differential Tax Incidence
  → When / tax is added / removed by altering another tax
  → So that overall revenue remains same
  → leads to differential impact → some gain, others loose
- Budget Incidence
  → Incorporates Taxation along with impact of Public Expenditure
- 2 Theories of Tax Shifting in Classical model
  i) Concentration Theory →

Finally incidence on. that sector of economy when surplus is generated. In classical model such surplus is in Rent (Ricardo) & landlords bag ~~[illegible]~~ Tax. In a Malthusian model (Ricardo) ↑ no & w → wage/stem → Rent ~~[illegible]~~ such people of land would not be able to employ

ii) Dispersion Theory → Surpluses are throughout economy & no is Tax Incidence

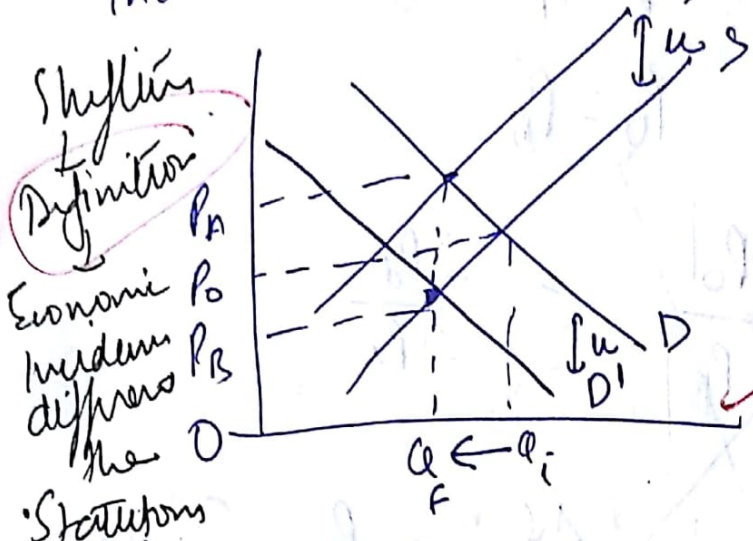
Modern Theory → SED → Tax Incidence or Divergent shifting

Partial Equilibrium.

Incidence of a Unit Tax in PC

Assumption → No 3. Decreasing cost
No Transfer Payment

Q. Show Equality whether tax on seller / buyer.



Shifting & Definition

Economic Incidence differs the Statutory Incidence

If a unit tax = u is imposed on the supplies, then the supply curve shifts upward to S' by an amount u (Done to recover costs). However, And overall PT to P_A.

~~This leads to out of pocket consumer.~~

Tax on buyer

As PL, OL to O_L

and in an Increasing Cost commodity, ~~Price~~ Net Price to seller falls to DP_B

Net Demand,

If tax on Buyer = u. The D to D' shifts by u.

& Price received by seller reduces to P_B.

However, consumer have to pay u Tax amount

∴ Total amount paid = OP_A

Burden shared in ratios of elasticity

Proof

$$E_s = \frac{Q_i - Q_f}{P_0 - P_B} \times \frac{P_i}{Q_i}$$

Burden of seller $= (P_0 - P_B)$

$$\frac{\Delta Q}{Q} \Big/ \frac{\Delta P}{P} \qquad E_1 = \frac{Q_i - Q_f}{Q_i} \Big/ \frac{P_0 - P_B}{P_i}$$

Burden of buyer $= (P_A - P_0)$

$$E_d = \frac{Q_i - Q_f}{Q_i} \Big/ \frac{P_0 - P_A}{P_i}$$

$$\therefore \frac{E_s}{E_d} = \frac{P_0 - P_B}{P_0 - P_A} \cdot \frac{|P_0 - P_B|}{|P_A - P_0|} \cdot \frac{|P_B - P_0|}{|P_A - P_0|} =$$

$$\Rightarrow \frac{|E_s|}{|E_d|} = \text{Ratio of burden shared.}$$

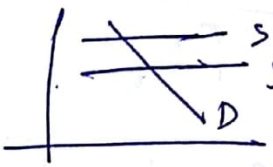
$$\Rightarrow \frac{E_s}{E_d} = \frac{P_0 - P_A}{P_0 - P_B} = \frac{(P_A - P_0)}{|P_0 - P_B|}$$

∴ Ratio of Burden shared by Buyer and Seller will be ratio of Elasticity of Supply to Elasticity of Demand (Opposite)

$\therefore \frac{\text{Burden (consumer)}}{\text{Burden seller}} = \frac{n_s}{n_d}$

Hence if $n_s \uparrow$ then consumer will share maximum burden.

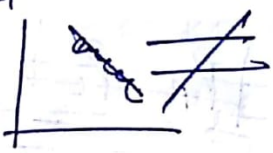
If $n_s = \infty$,



→ Ratio of burden $= \frac{\infty}{}$

And buyer gets all burden as Price rises by full amount

If $n_d = \infty$



$\therefore \frac{n_s}{n_d} = 0$

& Consumer does not share any burden.

If $n_d = 0$ → then consumer all burden.

$\frac{1}{\infty}$

$\frac{1}{n_s} = 0$ → All burden of seller (Land Tax)

Implications

1. For products having close substitutes (sid ↑↑), consumer bears less burden.
2. In LR if n_s, and n_d change i.e., elastic Consumer Burden ↓↓ (but n_s changes) Then can't be generalised

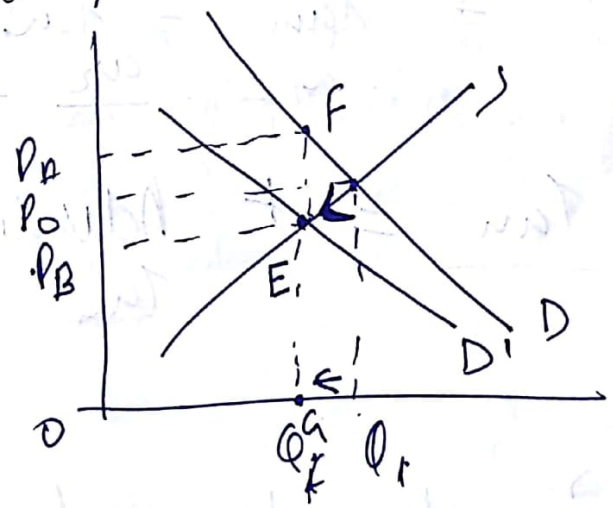
However in General equilibrium, 2 additional impacts :-

i) Backward linkage of Tax on factors & inputs
ii) Changes demand of other commodities

Ad Valorem Tax

Effect only on Demand (ROTE) curve → Don't write Rs

Here instead of Demand curve shifting as in Unit Tax, Demand curve swivels due to Proportionality of Tax

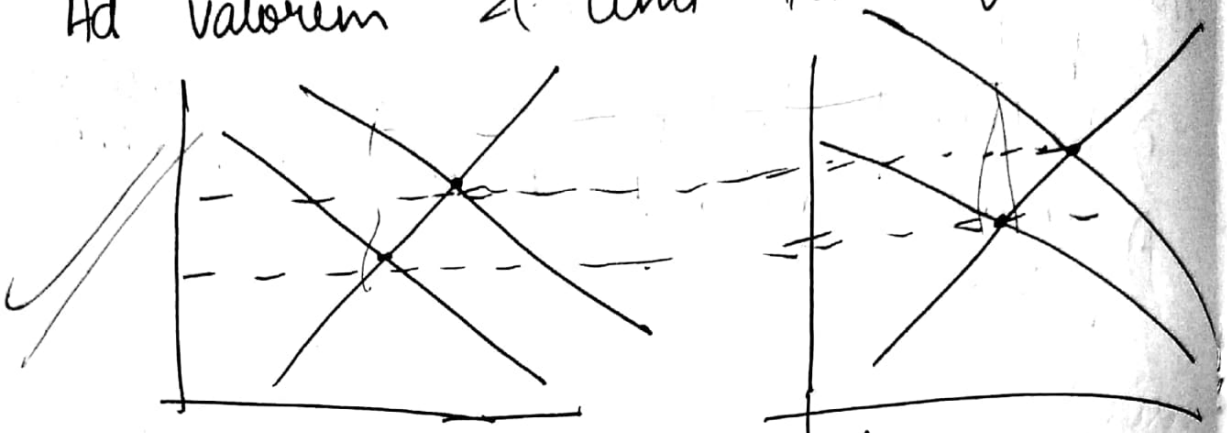


Tax rate = $\frac{EF}{EG}$ Tax collection = $EF \cdot P_B P_A$

Rice received by producers = OP_B

paid by consumers = OP_A

Ad valorem & unit tax equivalence



unit tax = u

Ad valorem tax rate = at

Show tax

Price paid by consumer = P_B = P_B

Seller = P_S = P_B

Tax = tax = tax

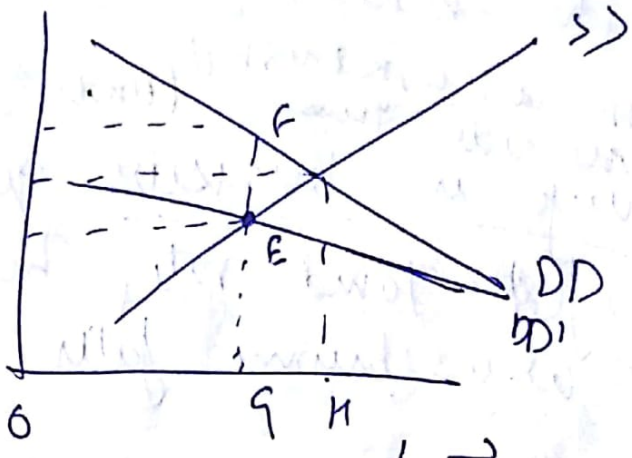
$= at \cdot P_S$ = $at \cdot P_B$

$\therefore$ u unit tax = t Ad valorem tax

But probably, advalorem makes demand more elastic. Hence, ...

Partial Equilibrium on Factor Taxes

Labour



$(= \frac{EF}{EG})$

Due to Imposition of a Payroll Tax (Ad Valorem Tax on Income),

The Net VMPL of Labour reduces & DD curve of curve Shifts to DD'

This causes decline in wage from w_0 to w_1, & no. of Labourers willing to work fall. from OH_1 to OG

Distribution burden → $(w_2 - w_0)$ & $(w_0 - w_1)$

Same on Capital

r%. ↓ & K ↓

However, unlike wages, capital is more mobile, ∴ Supply curve of capital is non-elastic & greater burden has to be borne by the user of Capital (say Debtor)

But, if capital flow is inelastic due to restriction on capital, the creditor will have to bear tax.

* Tax From Source side (supply side) (L, K & mobility) is Regressive generally even on Flat tax rate, because, share of wage income falls as Y rises

Thus, the opposite case of Flat Tax on Capital is Progressive, as share ↑ with Y.

General statement ⇒ exception exist
⇒ And depends on type of tax rate & slabs

From Demand side, (or Uses side) (Demand for L & K)

Tax on capital income may be progressive or regressive depending on sector where it is used. eg. in a labour intensive sector, it is Regressive (eg. Housing)

General Equilibrium

Product Tax →

→ Tax shifts to other Products as well

→ If Tax on 1 increases Demand ↑ its substitutes & P rises.

→ As output min changes, derived demand for factors also changes.

→ Continue until new equilibrium is reached (Many inputs factors)

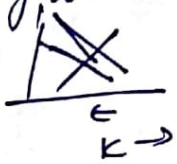
Factor Taxes

→ Tax on 1 factor is incident on other factor as well

→ Eg. If K taxed, then RVMPK falls and thus K ↓

As K ↓, $\frac{K}{L}$ ↓

& w falls



Partial equilibrium & Partial Tax

→ Depends on whether factor is mobile or not

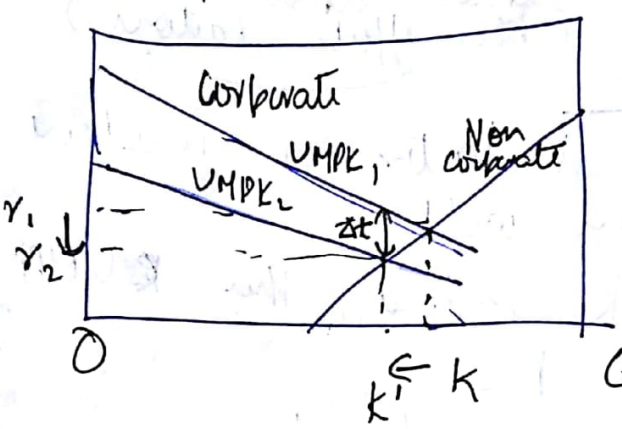
→ If immobile, (like land) then Tax is said to be Capitalised & an value of only that piece

when Tax is Imposed on factors in some sectors & not in others (Eg. Corporation Tax on K in formal sector)

of land ↓ while others still remain of Shifting would take. eg land

Mobile factors

→ Say Corporation Tax
↑ We use Edgeworth Box → to mean total K is fixed.



As tax (deadweight) at rate of Δt is imposed, UMPK in Corporate sector shifts to $UMPK_2$.

∴ Net returns decrease & Capital migrates to Non-Corporate sector, to take advantage of Arbitrage

This continues until equilibrium is established at a new reduced rate of r_2 & a total of KK'

Capital migrates from Corporate to Non-Corporate sector.

→ Effect on L
→ Non-corporate $\frac{K}{L}$ ↑ & labour benefits
& $\frac{w}{r}$ ↑

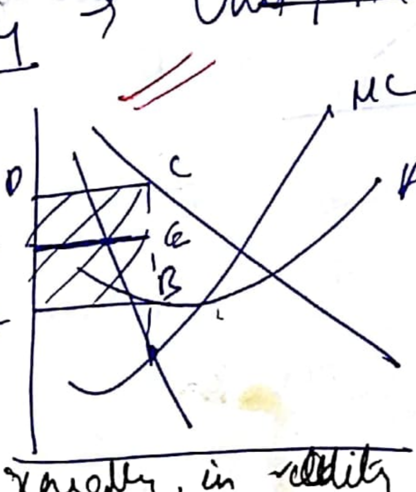
→ Effect on Uses
Corporate product users would be burdened as S shifts upward due to recover higher cost (Product market)

Non-corporate sector ~~benefits~~ users would also have some burden if costs are ↑ due to Greater Demand

But, net effect depends on rising cost due to more Demand & reduced cost due to Availability of K.

Tax in Imperfect Market

Monopoly → Unit ~~/ Ad valorem / Tax~~ / Lump sum / Profit tax

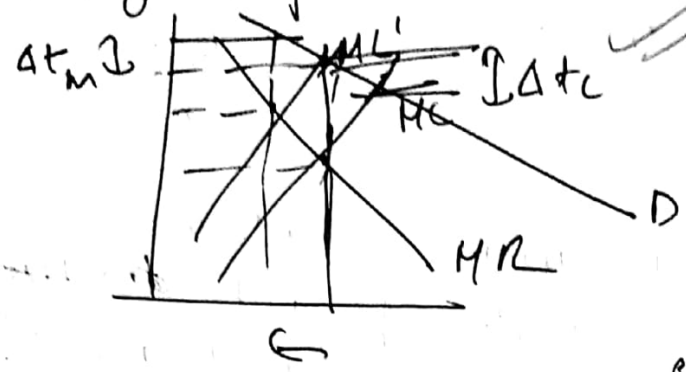


Monopolist absorbs as long as π > 0 (Even in LR)

If ~~Unit~~ Tax ~~flat~~ MR = MC same just that AC would shift up & π decline to APEF

Although, practically, in reality, Q > Qm before tax to allow some room & to avoid anti-Monopoly laws. Thus, in that case, ~~Ben~~ Shifting can happen.

Although if Unit Tax / Ad valorem



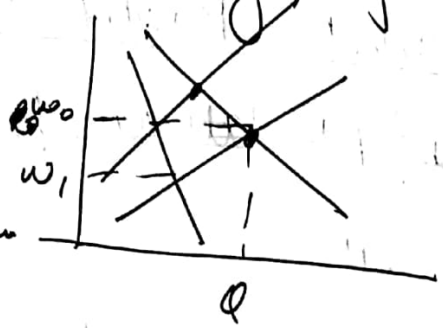
MC shifts & O! & P rises just like PC although total impact will be different due to elasticity differences of MR & Demand curve

∵ MR is less elastic than Demand curve (effective Demand curve in firm)

However, shifting is lesser than PC & P rises lesser ($\Delta t_m < \Delta t_c$)

Monopoly → Care on factors

→ Depends on Bargaining Powers.

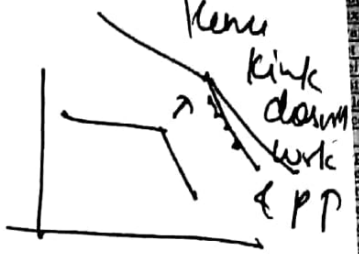


Bilateral monopoly

Triangle in between as DD' is also down But extent is [illegible]

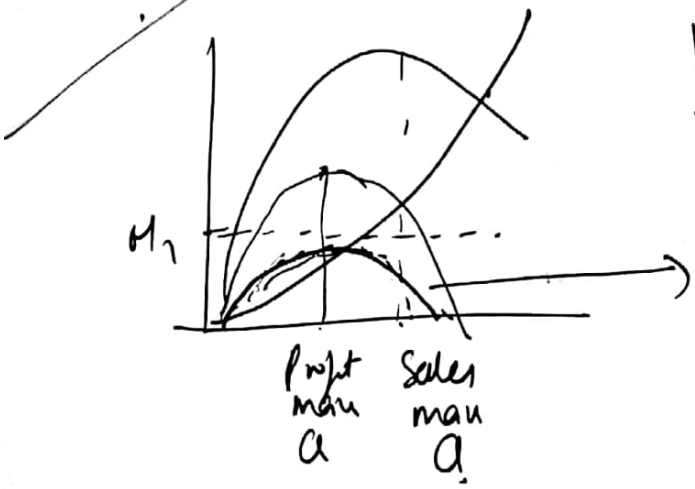
Oligopoly

→ If cooperative
→ Then by Kinked demand theory or by ~~Price~~ ~~Dominant~~ & Price leadership,



Price rises (Restraint, PC, Cartel → No effect

→ Although, results may be different if Firms have a Sales maximisation model



In such case, as long as $\pi > M$, will continue to sell as Before Q.

But, if Tax reduce Profit to below M, the firm would reduce Q & increase P & Shifting Taxes.

Efficiency Effect of Tax

2 reasons :-

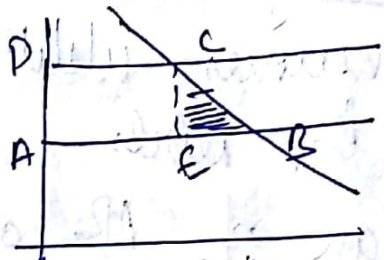
i) Administration & Compliance Cost

ii) Deadweight loss due to Distortion

Deadweight Losses

→ Commodity Tax.

Partial Equilibrium



→ To simplify we have taken supply curve as Perfectly elastic.

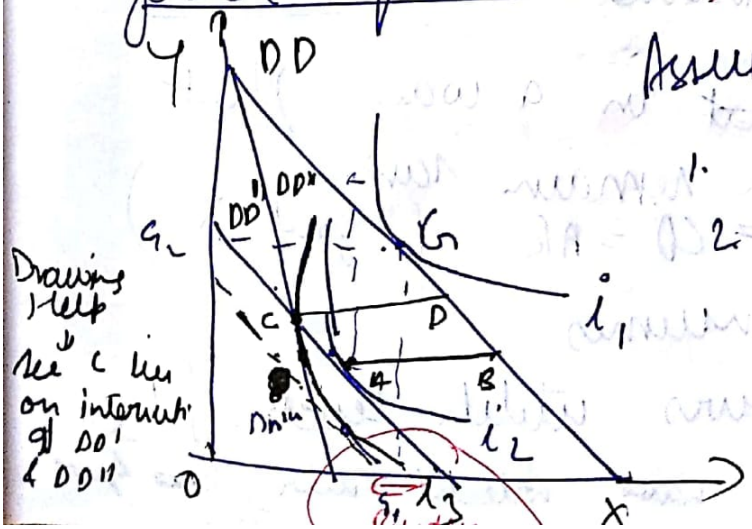
→ Tax raises the supply curve to cover costs & Price rise.

→ Consumer surplus reduce by ABCD

→ Govt. revenue increase by AECD

∴ Total Deadweight loss = EBC

General Equilibrium



Assumptions:

1. 2 products X & Y
2. Choice between (a) & (w) & Leisure is given.
3. Ordinal utility

Model

Without any tax, consumer consumes OQ_1 of X & OR_1 of Y.

But, if a General Consumption Tax / Income Tax / Poll Tax is imposed, the Budget line shifts inwards to PQ & consumer's utility decreases from u_2 to i_1 & i_2 levels.

Tax of AB. of good X is collected (Similarly AA' in term of good Y)

This loss of utility occurs because of Income effect

However, if a specific consumption Tax were levied only on X, then Demand curve would have swiveled to DD'' (in a way that tax remain same = CD = AB of good X)

However, here, consumer reaches a lower utility levels of i_3

(Alternatively, same tax would have collected with lower

Thus $i_1 \to i_2$ → Income effect

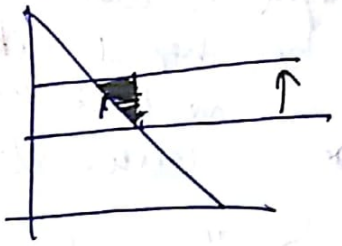
$i_2 \to i_3$ → Substitution effect

↓

Occurs because of distortion of choices as MRS ≠ MRT.

Negative Tax

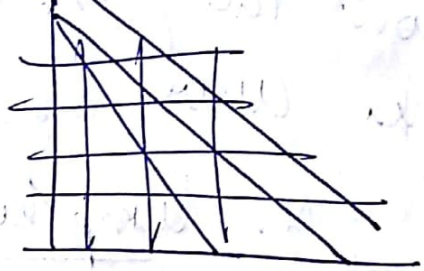
Subsidy → Excess burden

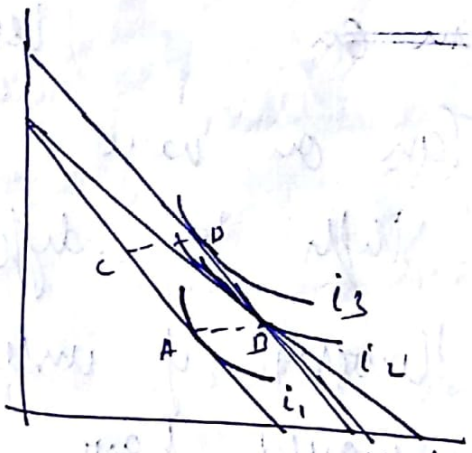


→ Deadweight loss shaded region

→ Increases Consumer surplus but more ~~Tax~~ Final Expenditure

General Equilibrium



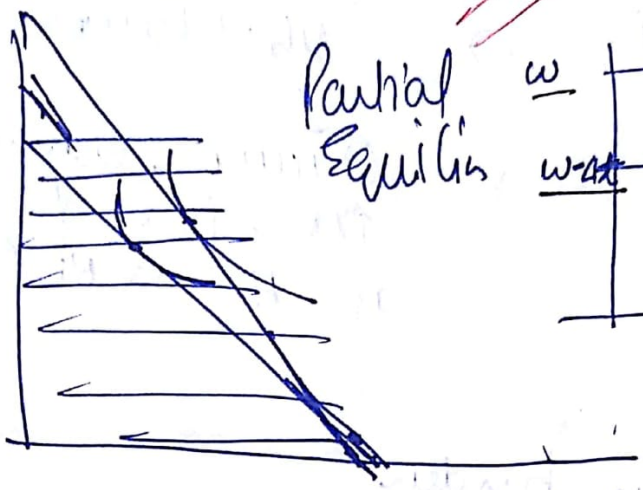


For same subsidy, we reach higher ~~level~~ utility level in a non-Distorting or a General Income Transfer Case.

Thus Distortionary tax ≠ subsidy

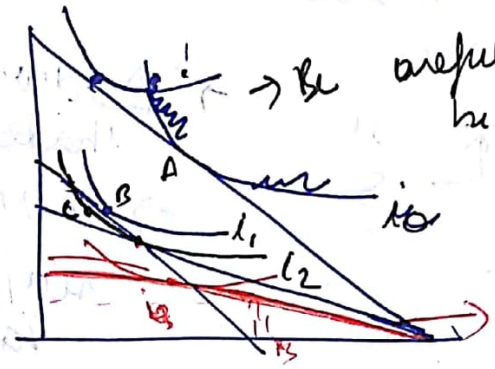
Choice between goods / wage & leisure

Assumption: Choice between products & between (2) constant



Partial Equilibrium

General Equilibrium



→ Be useful Ls would ideally be shaped like this no point as Y2, less leisure should be

is

Higher tax for Y>R.

~~Tax on~~

Tax on wage (income Tax / Consumption-Tax) shifts to indifference curve I_2.

However, if instead a lump sum Tax would have been levied (Poll Tax) then there would have been no Distortion due to substitution effect & would have instead move to indifference curve i_1 with utility levels greater than at i_2.

If tax is made progressive, distortion would only increase & we would fall further down to i3 (red)
→ Use this for showing progressivity vs Distortion

Fisher Save graphs for choice between Consumption & future consumption
→ only difference, future consumption is obtained by current savings with returns = i%
∴ future consumption = (1+i%) × current
(New Budget line straight)

∴ tax on Save and Y on saving

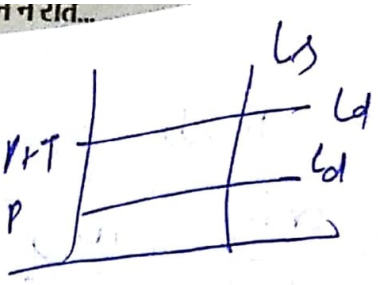
Thus, Income Tax ~~only~~ taxes the savings
∴ future consumption is reduced.

A general consumption Tax would have caused less distortion

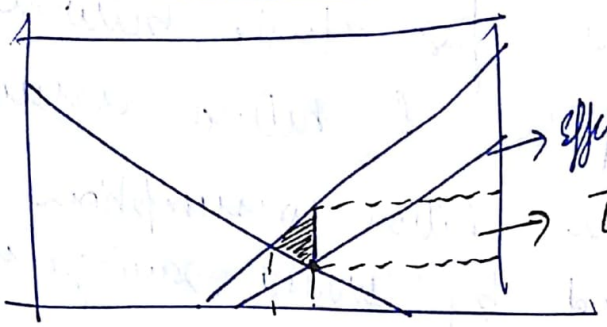
Better

Neutral.
future (reduces
(unlike Labour → when leisure ?)

Tax on land / Rent
No distortion



Choice between investments (Partial Tax)
Edgeworth



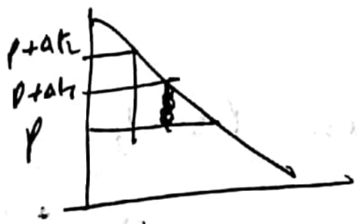
We obtained General Consumption Tax to be better than Income Tax keeping other choices such as Choice between products & W&L constant.
However, if they are made flexible, then no clear cut answers.

Similarly if W allowed to vary,
A general consumption tax will not create distortions between X & Y but create distortion between X & R
But, specific consumption reduces

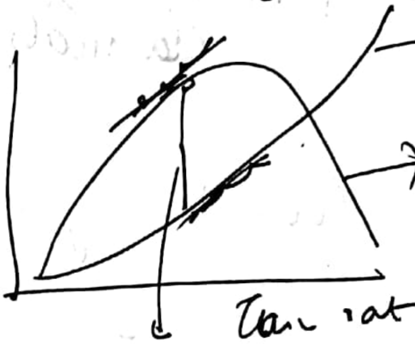
distortion between X & L (ROTE) but create distortion between X & Y

Hence no guarantee general consumption is better

Optimal Taxation



As Tax rate increases, deadweight loss also ↑

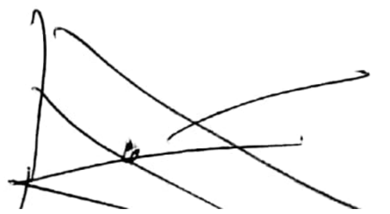


Distance max

Can be raised as <u>Optimal Tax Rate</u>

However → only efficiency
→ also need to see <u>equity</u> using SWF or vertical & horizontal equity rules.

Also,



Principle of Horizontal Social Advantage

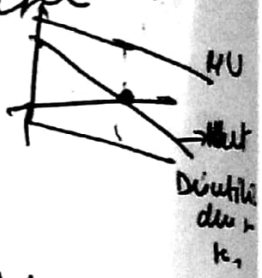
Ramsey Rule

Result → To minimise inefficiency, marginal excess burden of last unit of revenue raised from each commodity must be same

→ Higher elasticity → lesser Tax

Proof → See Gauran

→ Also Principle of Maximum Social Advantage



→ Overall

Optimal Tax → Good Canons

EEC GATS

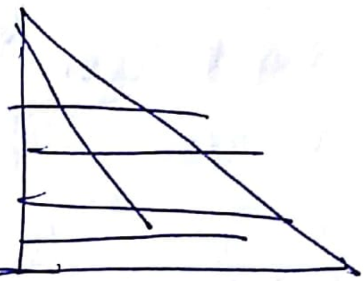
Hicks & Dalton Tax

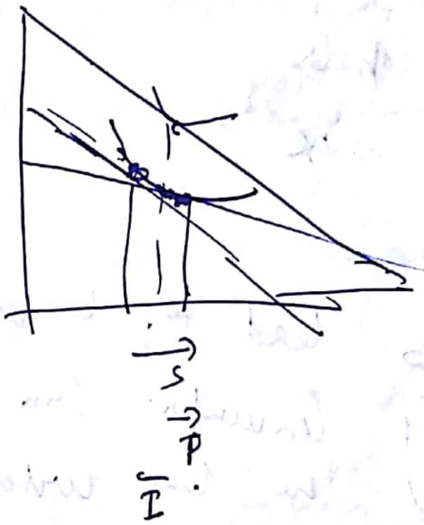
Effect of Tax on L

→ ~~Negative~~ Positive Income Effect on Leisure (But ∵ I↓, do effort L)

& Negative Substitution Effect

Generally, substitution effect outweighs & as T↑, ~~work par~~ labour participation ↓





Yes, it may depend on variety of factors like i) Higher Y people ⇒ may be less responsive as other form of motivation like say Prestige.

ii) Lower Y people → face lower tax (Ad valor.) ∴ less affected

Transfer Payment (Subsidies)

Opposite to Tax.

Income effect → +ve on leisure again & reduce ~~tax depends~~ intensity as whole

Substitution " → -ve on Leisure

Trampler rises or falls with Y

→ If rises with Y then Substitution >> Income & Upward slope

→ If decreases → May lead to Backward Bending

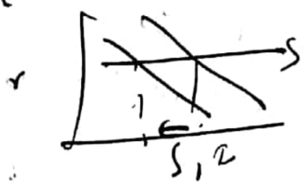
Effect on labor tax on Ls

→ Reduces Real wage

→ ∴ UMPL ↓ & L ↓

But may also lead to L saving more to avoid paying Consumption Tax. Thus, effect on L_s would be less certain

effect of tax on I



Rate def. Without Tax

r_q (return required) $= i + d$

Tax $r_q(1-t) = i + d$

Can be countered by giving tax credit c

$r_q(1-t) = i + d - c$

Direct vs Indirect Tax

Direct Tax

- Equity → as can be designed according to Ability to Pay
- Allocation → Minimise Allocation distortions & choice between & goods
- Acts as Automatic Stabilisers
- Has higher buoyancy, ∴ ~~Control of Growth~~
- Accountability of govt (Bailey & Tanzer)

Issues

- Reduce Incentives to work (Labour supply)
- Reduce " " Savings & Capital formation in short
- Difficult to apply Direct Taxes due in Developing countries due to Primitive Economies & Missing Tax Handles.
- More open → Greater opposition & resistance in tax collection → Hybrid

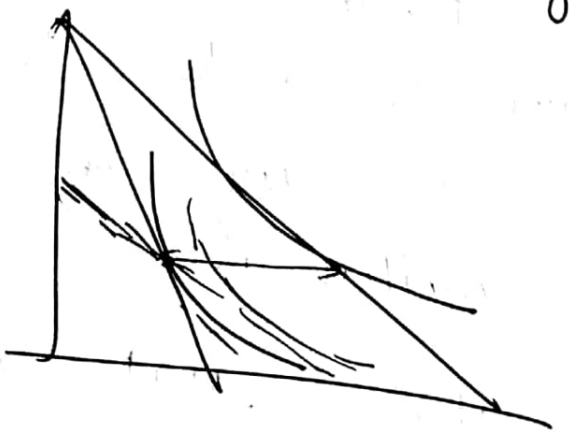
Indirect Tax

→ ~~Cost~~ Benefit

→ Ease in Collection
→ May be used to influence pattern of Production & Consumption
→ Lesser political opposition
→ ~~Costly~~ Rigidal

→ Demerit

→ Regressive
→ Inflationary → (Direct Tax is contrait in this because DC)
→ Distortion between 2 goods.



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Miscellaneous

→ Time Inconsistency Problem
→ Remember we saw in Rajan (Credibility of RBI)
→ Similarly, govt population policies may have unintended consequences due to Time Inconsistency Problem (govt not delivering on promise)
→ ∴ Time Capital Tax may lead to Perverse alteration in Capital flow & savings pattern.

→ See HG & understand from other Mankiw model of Time. (Gaurav)

→ Tiebout - Oates Model (also Samuelson role)
→ Aim → Provision of Local public goods e/p when 2 or more levels of govt & who should pay for it

→ Assumption → Individuals → Perfect ~~not~~ information
→ Free to move.
→ No issue due to migration
→ Ignore national level public good

Model

→ Sub category of public good that is restricted to people living in a specific geographic area

→ Hence, such goods acquire degree of Excludability even though they are Non-Rivalrous

→ In such case, everyone living in the locality has to pay

→ And free Rider become Compulsory Rider.

→ Anyone whose consume Preference doesn't match, may avoid it by migration to other communities.

Issues

Assumption-

• Club Goods

Public goods ↑ goods where they can be complete excludability even though Rivalrous nature may / may not be there

eg. Toll Road