

c701
Used Notes

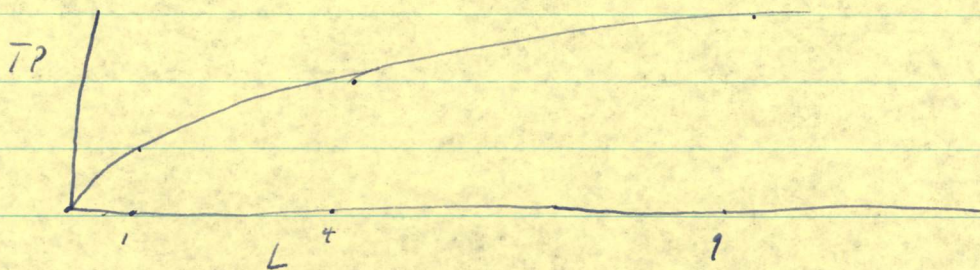
Notes on Prodn. Ecs. from Wickrell, pp. 101-44

1. Old-fashioned philosophical approach, labor ideas we now express more fully, but less profoundly.
2. Labor ~~is~~ involves exchange of leisure for products.
(A concept vital to factor supply.)
3. All land & capital enter into prodn., but not all man-hours.
4. Land, labor, & capital -- his 3 main groups
Marshall's "organization" is labor.
Trade secrets are mwp. (Or intangible capl.)
5. Non-capito. prodn., just labor & land, comes first in his anal. -
6. Dim. returns is universal, not peculiar to agric.
Views Ag returns w. suspicion -- attributes it to dubious assumption of that the new inputs required are unlimited. (But cf. 27)
✓ Marshall says dim. rets. apply to nature, & Ag ret. to human labor. W. criticizes. Try to find, cite.
- ✓ 7. (In fact, in rising mkt, most workers get less than MP bcs. of price discrim. favoring new workers. A common form of exploitation, based on different supply elasticities. (But is s.r.) Thus falling MP often means rising wage rate.

8. Wages = MP

Leaves a residual for land. p. 113; but on p. 124, finds symmetry.

9. Simple prodn. fn., $TP = k \cdot L^{\frac{1}{2}}$



(cf. later Cobb-Douglas fn.)

10. p. 116, confusing ~~numerical~~ algebraic e.g. bcs. "a" has 2 meanings

2d "a" is a,
but print fails to
distinguish

$a \equiv L$ and $a \equiv$ exponential coeff. of a , in this case $\frac{1}{2}$

$$MP = k^{\frac{1}{2}} L^{-\frac{1}{2}} = \frac{k}{2} \frac{1}{L^{\frac{1}{2}}}$$

$$Rent = TP - L k^{\frac{1}{2}} \frac{1}{L^{\frac{1}{2}}} = TP - \frac{k}{2} L^{\frac{1}{2}}$$

$$\text{Wage bill} = L \cdot f'(L)$$

$$f(L) = k \cdot L^a$$

$$f'(L) = k a L^{a-1}$$

$$WB = L k a L^{a-1} = k a L^a$$

$$P = L^a$$

$$Rent = P - WB = L^a (1 - k a)$$

10.

Review:

$$P = L^a ; (a < 1)$$

$$MP \text{ of labor} = a L^{a-1}$$

$$WB = L \cdot a L^{a-1} = a L^a$$

$$Rent = P - WB = L^a - a L^a = L^a (1 - a)$$

So the higher coeff. labor has, the higher its share.

11. Several blemishes of his capital theory.

Takes English capitalist-farmer as prototype (midwestern farmer, or Salinas Valley grower, or Leggett's or other drain renting sites, does equally well). On long invts., they pay phy. rent for some time before cashing in — i.e. they advance subsistence to landowner.

12. Robertus Carey, irrelevant historical objection that culture went from worse to better land.

✓ 13. (Speaks on several impls. of dim. MP:

- a. Wages indep. of T.P., same wages here
- b. Complementarity of land to labor. Effect of soil bank, etc.
- c. Free legal supply of land, extensiv & intensiv
- d. Oppn. from landowners & socialists -- outlet school, who like fuzziness.
- e. 2 fallacies -- i. Idealism of nonterminous intensity
ii. Max. AP

f. Interdependence of thys. of rent & MP. Rent is corollary of dim.

MP. (W. Strasser, p. 122)

✓ 14. Δ pop. lowers wages, raises rents. (Cf. L.V. in Japan. But also of H. G. on coop., & Marshall, supra.)

W., unlike George & Marshall, sees no Δ productivity from Δ q. pop. itself. Except in a small concession, p. 123-24

15. Rent is corollary of dim. ret.

16. p. 123. Defines "relative yield" as AP of labor. [Differs from rent, P-WB.] But W. sees AP as always falling — no Δ q. stage.

✓ 17. Dim. rets. is symmetrical. Add land, get dim. rets., p. 124

✓ 18. At const. rets. to scale, ΣMP s exhausts product.

p. 121. At const. returns to scale, Δ both inputs by 1%, ΔP by 1%.
Pay them and the 100 inner inputs each 1% of P , and exhaust it.
(Define elast. of prodn. $\frac{1\% \Delta P}{1\% \Delta I(\text{input})}$ (Cf. Bence; & of 23 infra, from W.p. 130)

$e = 1$ means ~~const.~~ ^{no} ~~ecs.~~ ^{no} of scale

$$e = \frac{\frac{\Delta P}{P}}{\frac{\Delta I}{I}} = \frac{\Delta P}{\Delta I} \cdot \frac{I}{P} = \frac{MP}{AP} \quad \neq$$

So when MP of a composite dose of all inputs = AP , have const. returns and exhaust product.)

✓ 19. E.g. of a prodn. fn. satisfying condition that $a \frac{\partial P}{\partial a} + b \frac{\partial P}{\partial b} = P$

is $a^d \times b^B = P$ where $d + B = 1$

$$\text{Then } a b^B d a^{d-1} + b a^d B b^{B-1} \stackrel{?}{=} P = a^d b^B$$

$$a^{1-d} d a^{d-1} + b^{1-B} B b^{B-1} \stackrel{?}{=} 1$$

$$d + B \stackrel{?}{=} 1 \quad \text{yes by assumption}$$

✓ 20. (A returns implies ΣMP s ^{more than} exhausts product.

But this is not unstable if the employer discriminates among inputs and pays the earlier ones ~~their~~ less than their MP . Or he might pay them all $< MP$, being a monopsonist; or he might sell as a monopolist at a higher price, altho that is subsumed in ~~saying~~ valuing MP .

✓ 21. (Open access is a way of socializing rent -- but in the process destroys it.)
(Postage stamp pricing, indefinite extension of lines, is indirect means to same end.)

22. Discuss. of scale -- p. 129, W. takes Δ xptn. cost as sole e.g.

23. p. 130, comes at elast. of prodn. Defines $k \equiv \frac{\text{output}}{\text{input}}$, then says that as long as you can Δk , have Δ returns.
(But to Δk , must Δ output by higher % than Δ input)

24. In reading W. watch his change of pace. Wordy for pp. suddenly compresses much into one para. or = 2. Often in smaller print.

25. (23) also implies that $\left(\frac{MP_L}{L}\right) = k$ to maintain const. returns, where $MP_L \equiv MP$ of labor & L is the wage rate. Normally, $\frac{MP_L}{L} = 1$

But when $k > 1$, could have const returns if $\frac{MP_L}{L} > 1$.

If have const. returns with excess profits, new comers will bid up wages & rent to exhaust them, but won't decrease opt. scale.
Bcs. $k = 1$ at same scale.

26. If is room only for one firm, that first on the scene has an actual monopoly. bcs. for a 2d to come wd. only ruin both.
A prescription w/o benefit of doubt. p. 131. Note the

~~27.~~ big advantage of the first firm in games of bluff, etc. bcs. its historical cost is sunk, while newcomers would face certain loss of funds not yet committed.

27. Δg returns & persistent unemp. are ~~now~~ increasingly common.

So $k > 1$ may persist. But even here, $\frac{MP_a}{L} = k = \frac{MP_b}{L}$

$\equiv \frac{MP \text{ of land}}{\text{rent per unit}}$

(Note change of mood from (6))

28. Everywhere treats land like labor as a hired factor. Contrast residual approach of English school. (change from (8), p. 113)

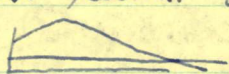
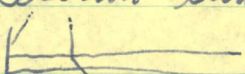
[This is ok for case of indiv. firm, but re factor supply & tax. free input supply of land is unique.]

✓ 29. Conceding that div. rets. to firm may not be whole picture bcs. there is some Δg rets. to ec. as a whole, yet concludes that anal. of div. rets. does apply to whole.

(I say is fallacy of composition.)

30. New techn. may be land-saving or labor-saving. Land-saving is just as likely -- e.g. development resources.

✓ But if labor-saving, refutes Ricardo that it might reduce total output. Bcs. employers only dismiss labor if can produce more elsewhere. (p. 138, suddenly landowners are the entrepreneurs -- adopts the English fallacy from Ricardo?)

New Techn. changes certain land from land of low i.g. to hi. from  to . So output falls from

✓ the land. But every man dismissed has MP elsewhere nearly as great as here, so that is little loss.

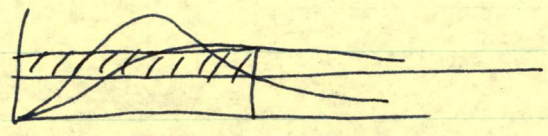
31. Free comp. will use TP, but may lower distrib. share of labor.
p. 141. This limits desirability of free comp. But, p. 142, wants to solve distrib. wrongs w/o worsening allocn. By somehow, (unspecified) redistrib. ^{rent & int.}

32. p. 142 Forestry is good e.g. of land use that subs. capt. for labor. Thus artificial low $\bar{r}$ takes land from labor.

Capt. is highly substit. for labor, in sense of Δ long-run eq.

Mon., 2-26-68

1. Review Euler's Theorem.



$\overline{r}$ is rent of residual inputs. It is clearly the "net product" of said inputs. Divide it by no. of units, and get ANP.

Now suppose $MNP \neq ANP$. Firm can gain by growing larger or smaller

2. Cobb-Douglas.

(Note who Douglas is)

$$y = k a^\alpha b^\beta$$

The reason for putting the coefficients in exponential form is to emphasize % relationships, or elasticities of production.

If $y = x^2$, then if the 2 goes to 3, a 50% rise, then y rises by 50% of x.

$$\text{(i.e. } \frac{dy}{dx} = \frac{2x}{x} = 2 \text{)}$$

$$\frac{\% \Delta y}{\% \Delta a} = \frac{\frac{dy}{da}}{\frac{y}{a}} = \frac{\frac{d \log y}{d \log a}}{\frac{1}{a}} = a \frac{0 + \frac{1}{a} + \beta \cdot 0}{1} = \alpha$$

Also, if $\alpha + \beta = 1$, have const. returns to scale.

So they analyze prodn. data in this form, and find values for α & β , and draw conclusions.

Common errors:

1. Find α & β at one point, apply over whole range.
2. Under quantify actual amounts of resources used by larger firms - based on historical cost, etc.
3. Reason by aggregates -- i.e., what would happen if every firm got larger. If most are too small, conclude all should get larger, by looking at what wd. happen if every firm got larger.
If look at largest farms, they lose money, are tax shelters, & rent land to soil banks.

MNP graph shows forces better. Today, general expansion, marg. value > ave. value. But beware.

Also, overlooks credit rationing problem. Expansionary land is free for some; expensive to others.

So, get better idea of exs. of scale by looking at
real factors involved, as on p. 2, green ink. Review.

3-4-64

1. Complete anal. of MNR - partly

a. Is symmetrical. J. Rob. uses labor as indep.

My method based on availability of relevant data.

b. MNR means more than MR

✓ c. Criterion for cutoff in space, analogous to cutoff in time. Spread + the overhead is good - to a point.

2. Receiving $R_c = a$ won't change a, bec. a is iply. equiv. of what you did get, R_1, R_2 , etc.

3. Price thg is easier than Lieb. makes it.

Defensive - needless excessive formality.

1
Pam defensive + harizing. Abstract to the point of sterility
Model-building, w. more emphasis on the model than the
reality behind + what it is supposed to rep.

$$a = \frac{\sum_{n=1}^{n=t} (R_n (1+i)^{t-n})}{(1+i)^t - 1} \quad (t > 0)$$

Receiving $R_1, R_2, \dots, R_n, \dots, R_{t-1}$ is the same as

✓ receiving a each yr. steadily. $\therefore$ to receive $R_t = a$ won't change that.
For as many yrs. as we can go on getting $R_n = a$, a remains fixed.
If $R_n > a$, ruin a; & v.v. Seems self-evident.

p. 21 Lieb. is involved in explaining = in conditions of a model.
✓ That is carrying theory to a point of obsession.

✓ Wants "rigor" in defn. of compn. But "large no." is vague.

✓ Defining perfection is sterile. And misses impt. aspects: divisibility;
Leaves out space & time. Actually, need a what place. As to info.,

✓ costs money, & perfection is nonsense if requires large expense to spread info -
only that amount of info. is justified that pays its cost.

Much info. is best handled by pooling.

Unrealistic air about p. 21 whole line.

0. Stationary w. No development, no cap. exp.

1. 'Large no.' is vague, not 'rigorous'.

Where are buyers & sellers? Firms. cluster around one plant,
local mnp. vs. local cartel w. votes & night riders.

Implies that large nos. neg. But can have ex. pricing of mnp.

2

service, & govt. service

2. Homog. commods? Nonsense, that is inhuman, denies the individualistic character of mkt. It's richness is diversity, variation.

No time dimension - build up repr. as invest. over time cash in later, evaluate as a whole.

Divisibility more important.

3. 'Perfect' knowledge? Uses perfection to define perfection.
(A misrep. of the man - no genius)

Knowledge costs money.

Forecasting involves risk & doubt - is no perfection, a will o' the wisp. Improved forecasts desirable.

Knowledge is itself bought & sold, produced etc. [Not always - pooling is useful, & widespread.]

4. Rationality? Nonsense. Indefinable. Degrees of astuteness. It's our effort to be rational, a cost. Beyond a point, not rational to be rational.

By their desires & aversions, men ^{in agree.} create exch. value in things; & as individuals, seek to acquire it in good form; & to dispose of select from the general

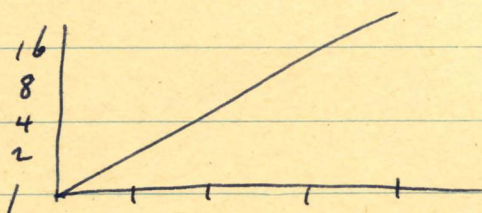
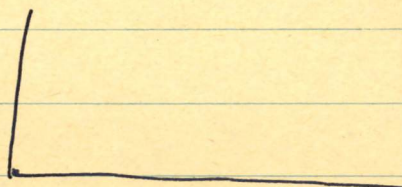
$$V = (1+i)^{-1} + (1+i)^{-2} + \dots + (1+i)^{-n}$$

$$= (1+i)^{-1} \frac{1 - (1+i)^{-n}}{1 - (1+i)^{-1}} = \frac{1 - (1+i)^{-n}}{1+i - 1}$$

$$S = 1 + r + r^2 + \dots + r^{n-1}$$

$$rS = r + r^2 + \dots + r^{n-1} + r^n$$

$$S - rS = 1 - r^n$$



Money doubles every $\frac{.72}{i}$ years

Note % diffs. get larger, not just absolute.

0. Sensitivity
to i

PV



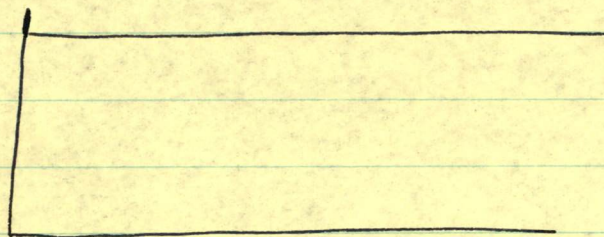
1. Point case

a. r the residual

$$1 = (1+i)^n (1-t) (1+r)^{-n} + t \cdot (1+r)^{-w}$$

$$\text{If } w=0, \quad r=i$$

$$\text{If } w=n, \quad r < i; \quad r \propto n$$



Ex. 701

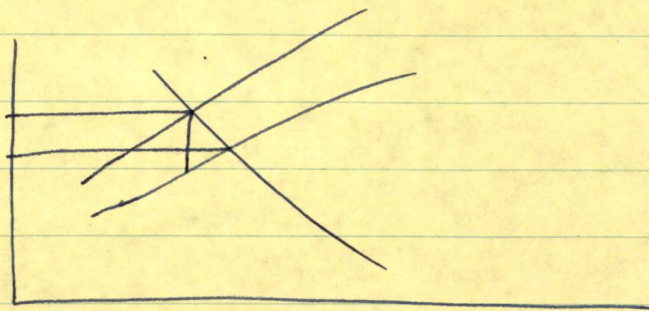
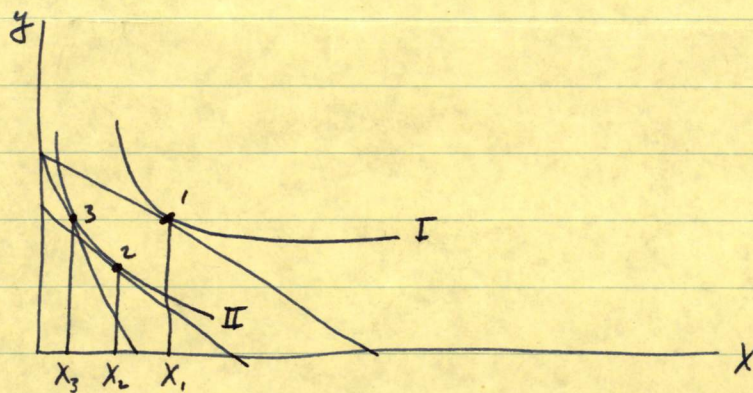
Exercise combining mpy. theory
and capital theory.

Cartel, e.g. in oil, limits output on
what criterion? $MR_0 = MR_n(1+i)^{-n}$

Just as walnut people, dumping,
equate MR in different markets, so
nine cartels can equate in
different years. "Dump" into the
future.

~~The~~ Postage-stamp pricing is also an e.g.
of dumping. So is all P -discrim.

Excess Burden

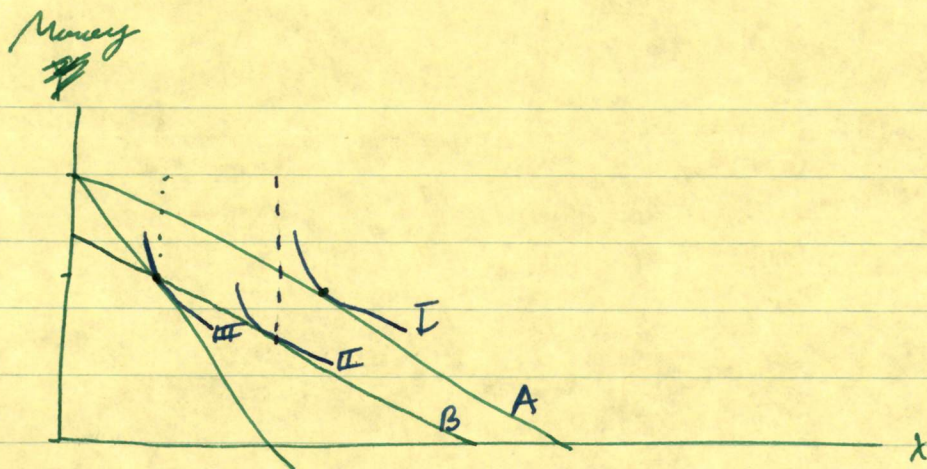


Tax is put on X .

Tax collected $= tX_3$. It is not very much, because X_3 is small. If you tax directly, or tax everything, could move to 2, on II, instead of 3, collect tX_2 and tY_2 as well. ~~to~~ -- or some equivalent direct tax.

Explain thus: as you Δt_x , X gets smaller, so to raise a given tax must move back on indiff. curve more & more? No, move to lower indiff. curves.

Assign for next week



Sequence.

1. Tax collection is vert. distance between p.p. constraints, A & B
2. Lump sum or universal tax wd. lower cons. to II. Pure inc. effect
3. To collect same tax from partial excise, ~~is~~ constraint line becomes steeper
 - a. If goes to B, can't collect as much tax unless all spending shifts to X - & why shd it?
 - b. If goes thru II, B, not tang. to indiff. curve.
 - c. Must move back to III

Thus show excess burden of "indirect" tax — actually, of a tax that can be avoided, a tax on something for which demand is elastic (nothing said about supply.)

What is ex. thy? Not the geometry. It is knowing enough of the geom. to understand & use it, & going on from there to understand what it means. Danger of the geom. is that for some it is so hard to grasp it, that becomes the major effort, & basic problem not grasped or solved.

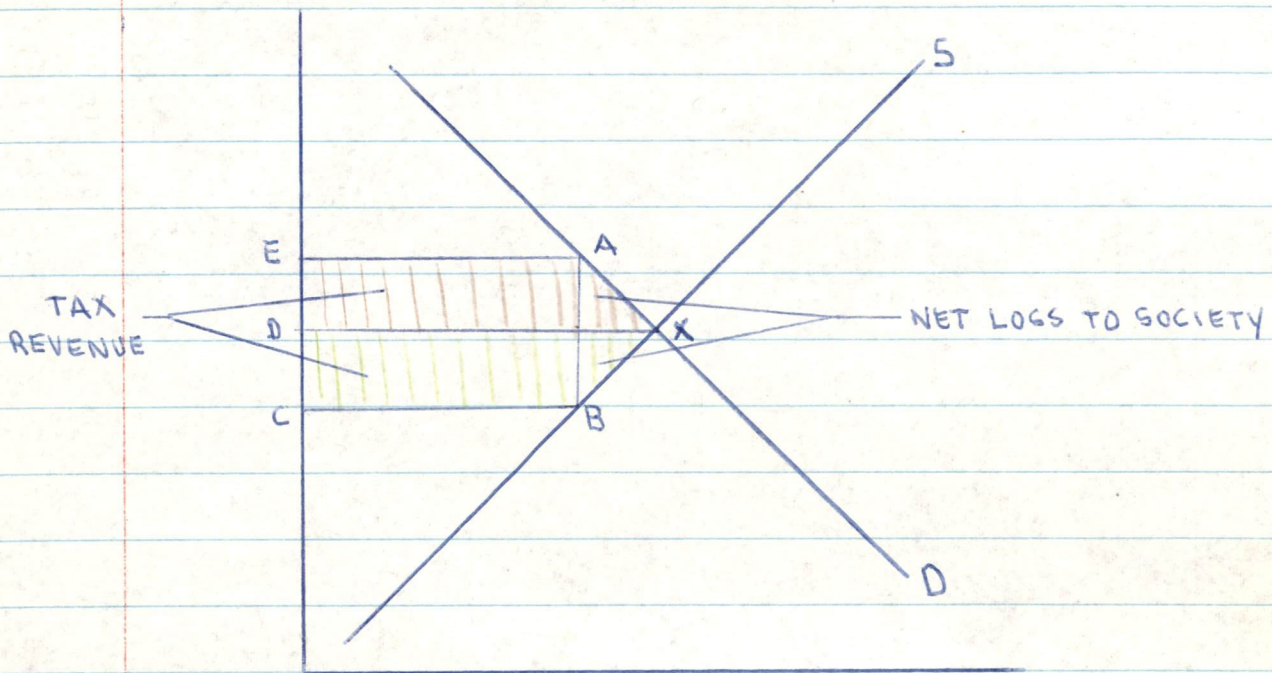
For now, give little heed to developing indiff. curves. Rather, see if they are useful later.

Wd. case vs. 'indirect' tax apply to any partial tax, e.g. on land?
 No, bcs. wd't affect price, hence wd't reduce consumption at all.
 No inc. effect at all, $\therefore$, no substa. effect either. Collect taxes w/o any Δ burden on consumer -- opposite of excise burden

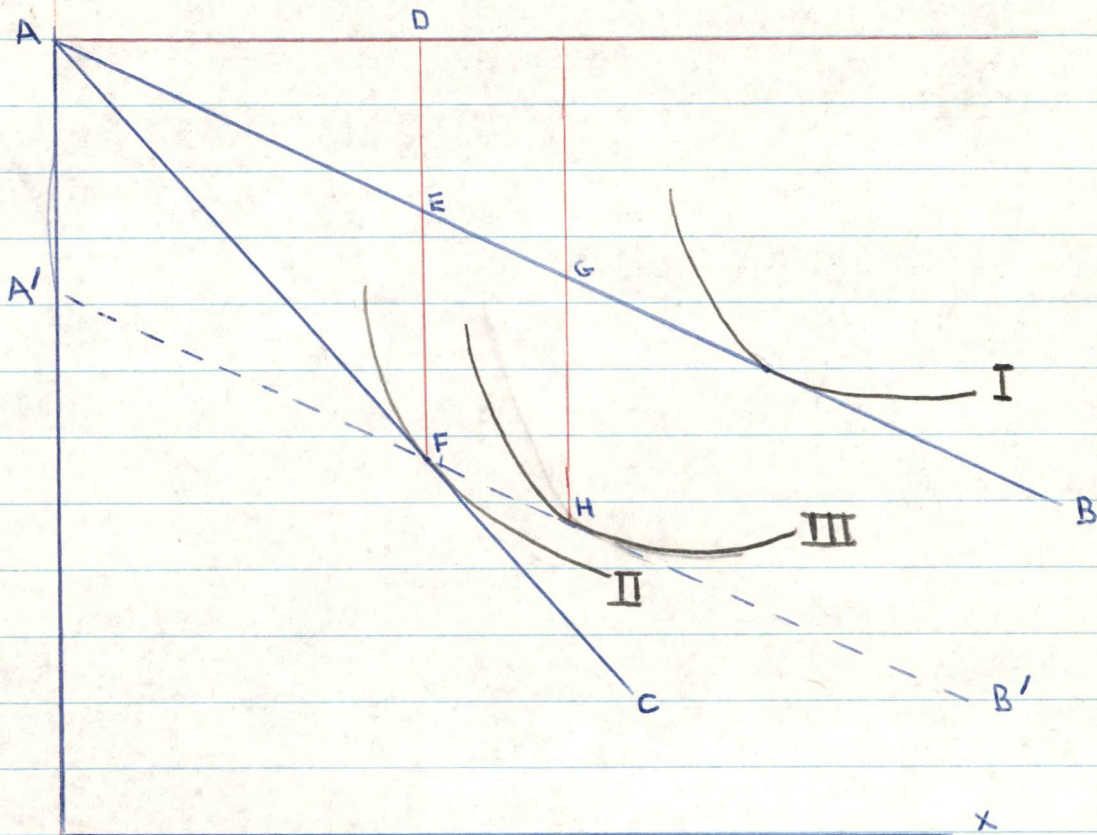
Δ price results from $-\Delta$ supply, so anal. postulates that.

S & D anal. of excise burden is more revealing. Is converse of ~~same~~ golden triangle anal.

For prodn. ex. sub. equal-output curves for indiff.

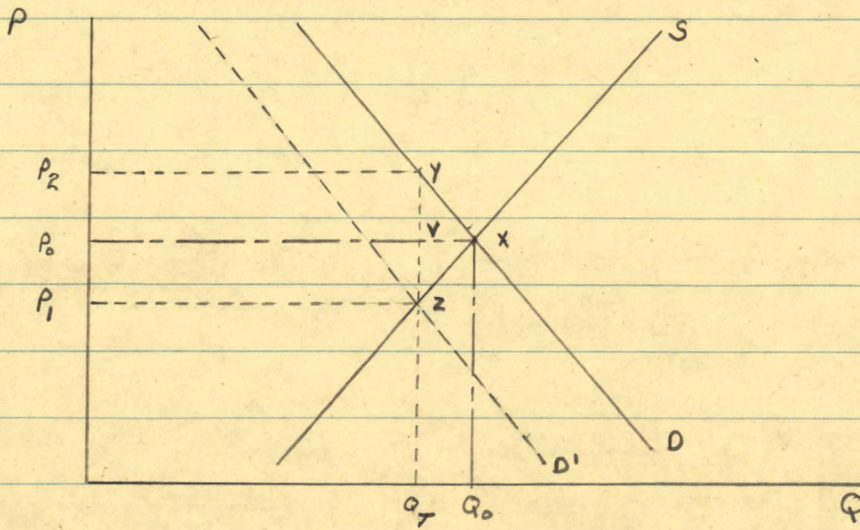


original equilibrium at point X. AB represents the amount of the tax. point A results from a shift of the supply curve upward to the left representing price after the tax. Point B represents sales receipts of the sellers exclusive of the tax. Area AXDE |||| loss in consumer surplus. Area BXDC |||| loss in producers surplus. ABCE amount of tax collected. AXB net loss to society. The incidence of the tax, amount of loss in consumer or producer surplus, will depend on the elasticity of demand.



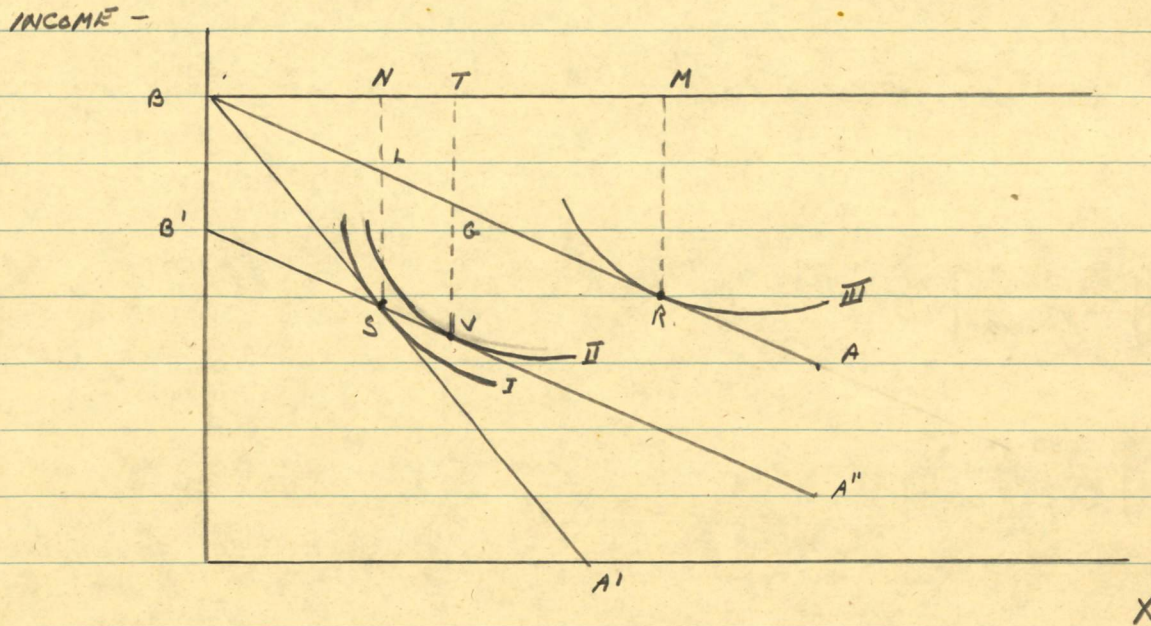
AB original price line, Δ on indifference curve I.
 AC price line after imposition of excise tax,
 at the original price AB the consumer
 could have purchased AD units of X at a
 cost of DE, after the tax AD units will
 cost him DF the amount of the tax is
 then EF. If instead of the excise tax
 a income tax was imposed, the income-
 price line would shift to A'B'. The
 amount of tax collected would remain the
 same $EF = GH$, but the consumer would be
 on a higher indifference curve III. The
 excess loss ~~is the~~, or net loss, is the
 difference between indifference curve II and III.

DEMONSTRATE THE EXCESS BURDEN OF EXCISE TAXES.



P_0 and Q_0 represent the equilibrium price and quantity. The imposition of an excise tax reduces the quantity to Q_1 and the price, including the tax, rises to P_2 . Consumers must pay P_2 and suppliers receive only P_1 for each unit. The entire tax paid to the government is represented by rectangle P_1P_2YZ . The amount of tax shifted to consumers equals rectangle P_0P_2YV and the amount of the tax borne by the producers equals P_1P_0VZ . Consumer surplus is reduced by P_2YXVP_0 and producer surplus is reduced by P_0VXZP_1 . The triangle XYZ represents a net loss to the economy and society as a whole.

INDIFFERENCE CURVE ANALYSIS



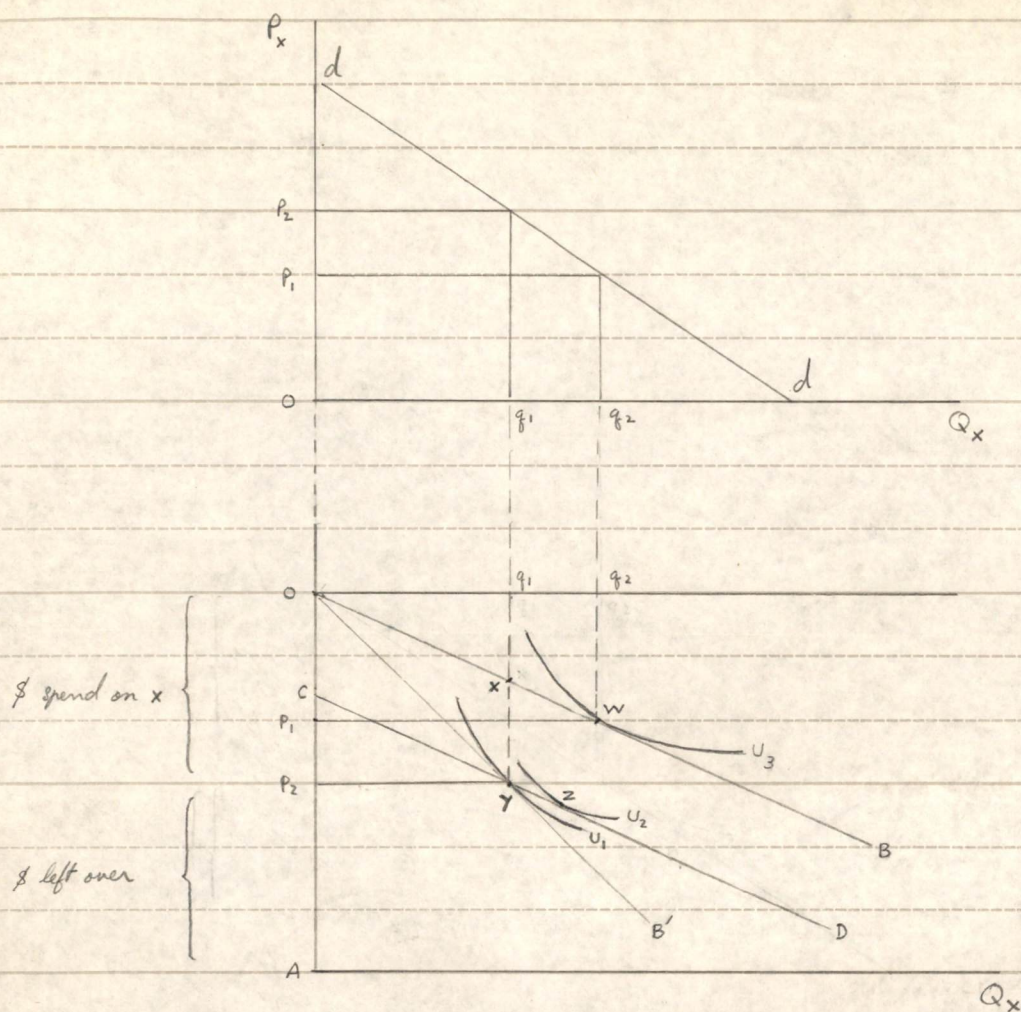
Price of commodity X is indicated by the slope of price line BA and the consumer buys BM units of X. If the price of commodity X is increased by virtue of the imposition of an excise tax on the commodity, the new price is indicated by the slope of the price line BA'. At the new price the consumer takes BN units of X and pays SN dollars for it. At the original price, before the excise tax, the consumer could have bought BN units of X at a total cost of LN dollars. The difference between SN and LN (= SL dollars) must be the total amount which the consumer pays the government, as excise tax on the BN units purchased.

Next, suppose there is no excise tax and the price goes back to the original price represented by the slope of BA. But the government levies ^{an} income tax which takes from the consumer an amount equal to the SL dollars which he paid as excise tax on commodity X. The income tax, in effect, reduces the consumer's income B'B, which is equal to SL, represents the amount of the income tax.

The consumer's income after tax is OB' and the price line equals $B'A''$ which passes through point S on indifference curve I . ($B'B = SK$) The consumer could move to point S on indifference curve I and be as well off as he was under the excise tax. I is not tangent to $B'A''$ at S . Therefore S is not equilibrium. The new equilibrium will be at V on indifference curve II which is a higher indifference curve than could have been reached with the excise tax. The total amount paid as tax is the same for both the excise and income tax. Since indifference curves cannot intersect, the indifference curve II is tangent to $B'A''$. It is higher than I .

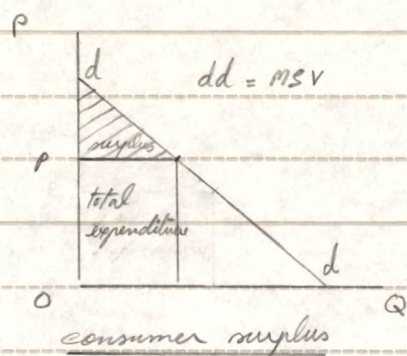
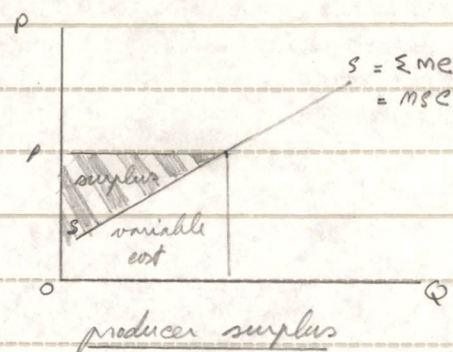
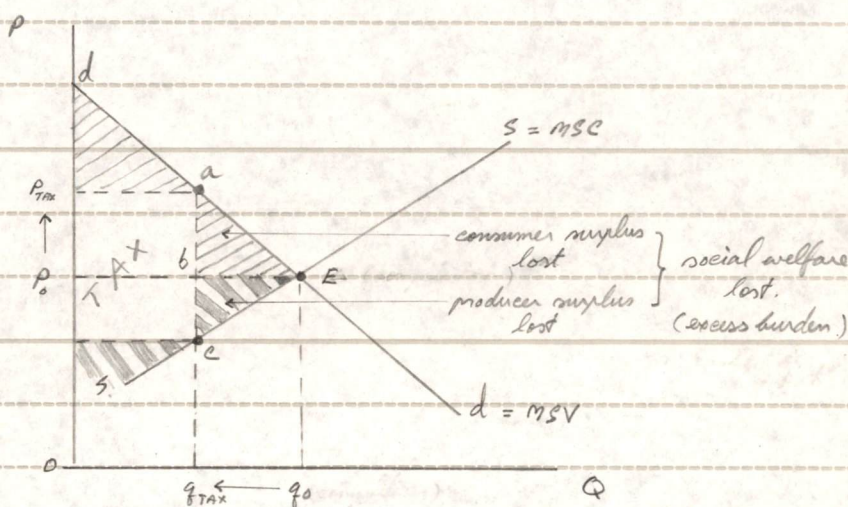
Even though the consumer pays the same amount in both cases, he is better off under the income tax. In both cases the consumer is subject to an adverse income effect, but in the excise tax case there is also an adverse substitution effect. With the income tax the consumer is free to spend what he has left after taxes but with the excise tax both the consumer's real income is reduced and relative prices are disturbed.

The burden of the excise tax is the difference between indifference curves I and II and this is not readily measurable.

2. The use of indifference curves.

1. On the lower graph, the budget line is OB and the quantity of x bought is oq_2 with the price op_1 .
2. After the government imposed the excise tax on x the budget line is OB' and the quantity of x bought was reduced to oq_1 with the higher price op_2 .
3. The quantity oq_1 can be bought with the cost $= q_1x$ on the budget line OB (before tax) and with the cost $= q_1y$ on the budget line OB' (after tax). Thus, $q_1y - q_1x = xy =$ the amount of tax imposed.
4. If instead of excise tax, the government imposed an income tax in equally amount (xy) which will shift the budget line to CD . The consumer's equilibrium will be at z on the

indifference curve U_2 which is the higher indifference curve than U_1 . Thus, with an equally amount of tax, the consumer will be better off with an income tax. The excise tax then gives an excess burden to the consumer.

1. the use of demand curve.

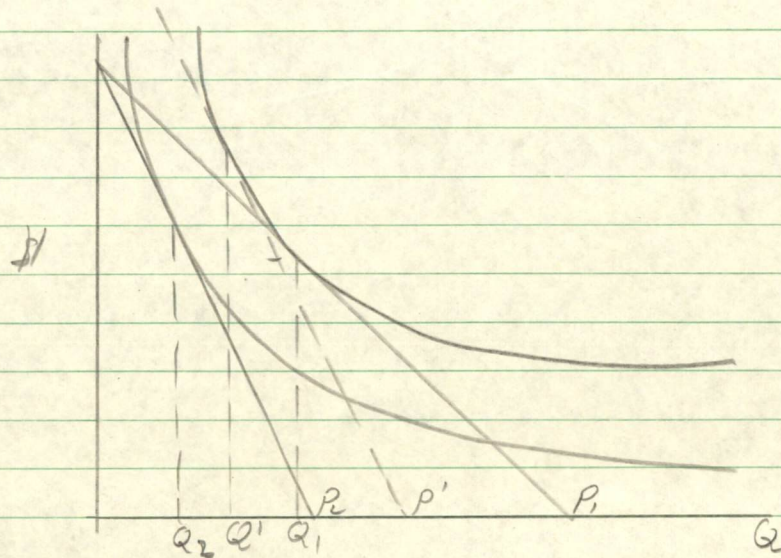
Suppose the government levies a tax on each unit of output to reduce the producer surplus. The cost of output will increase and the amount of output will be reduced to quantity after tax (q_{TAX}).

Since the demand curve has a negative slope, the reduced output will be sold at a higher price (P_{TAX}). The burden of the tax then falls on both the producer and the consumer.

The surplus of both producer and consumer are deducted more than their share in tax. For the producer the excess lost in surplus is equal area Ebc , due to the reduction of output. For the consumer the excess lost in surplus is equal area Eab , due to the rise in price. And the combination of both excess lost in surplus is the social welfare lost.

EXCESS BURDEN OF EXCISE TAX:

1. INDIFFERENCE CURVE ANALYSIS



WITH TAX: QUANTITY PURCHASED: $Q_1 \rightarrow Q_2$
PRICE: $P_1 \rightarrow P_2$

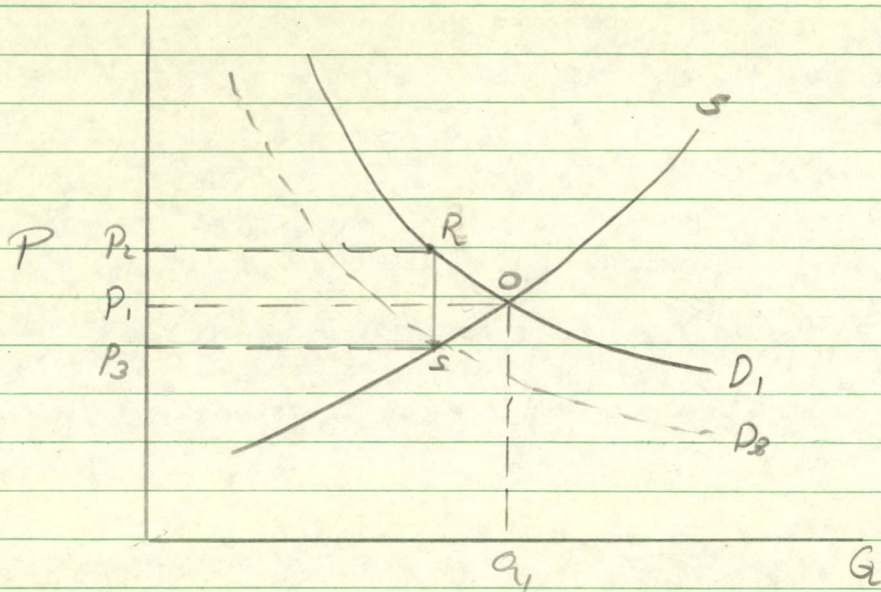
CONSUMER @ SAME RELATIVE PRICE LINE AFTER TAX: $P_1 \rightarrow P'$

TOTAL LOSS IN CONSUMER WELFARE: $Q_1 \rightarrow Q_2$

GOV'T COLLECTION: $Q_2 \rightarrow Q'$ [LOSS IN INCOME]

EXCESS BURDEN: $Q' \rightarrow Q_1$

2. Supply & Demand



BEFORE TAX EQUILIBRIUM: Q_1, P_1

IMPOSITION OF TAX $\Rightarrow$ INCREASE IN PRICE TO P_2

DEMAND FALLS TO D_2 , PRICE FALLS TO P_3 .

GOV'T COLLECTS $P_2 R S P_3$ IN TAXES

TOTAL CONSUMER LOSS: $P_2 R O S P_3$

EXCESS BURDEN: $R S O$

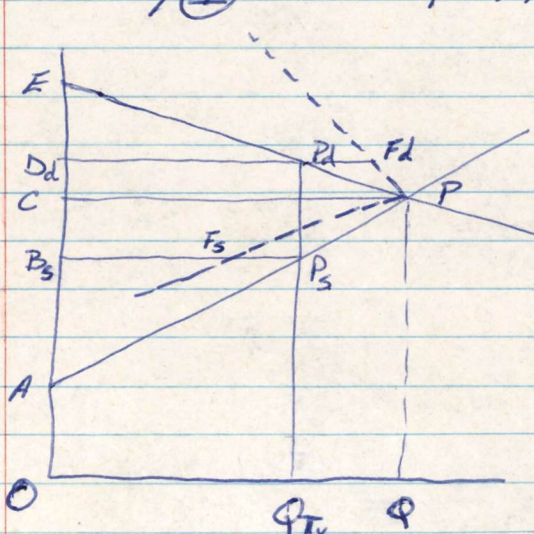
EXCESS BURDEN OF INDIRECT TAXATION BY USE OF INDIFFERENCE CURVE ANALYSIS

① VERTICALLY PARALLEL INDIFFERENCE CURVES $\Rightarrow$
ALL $MRS_{\$X}$ ARE $=$ HENCE, MRS IS INDEPENDENT
OF THE Q OF $\$$.

MARKET CURVE (D-S) IS GENERATED FROM THE
SLOPES OF THE INDIFFERENCE CURVES AT A GIVEN
 Q OF COMMODITY X ; d.h. THE ENTIRE SET OF
INDIFFERENCE CURVES ~~ARE~~ IS RESOLVED TO A SINGLE
 MRS CURVE BECAUSE OF EQUAL SLOPES (ISD's)

② NON $\parallel$ INDIFFERENCE CURVES GENERATE A MATCHED
SET OF MRS CURVES. WHERE SLOPE OF PRICE
LINE $=$ SLOPE OF INDIFFERENCE CURVE THEN THAT
 Q OF COMMODITY X POINTS OUTS ONE POINT OF
THE MARKET CURVE (REPEAT UNTIL DERIVED)

BY Σ ALL INDIVIDUALS D-S CURVES (MARKET CURVES)
W/ ① ABOVE, THEN:



TAX $=$ S Pd $\neq$ as result
Volume becomes Q_{Tx}

Buyer's Price $=$ S Q_{Tx} Pd

Seller's Price $=$ S Q_{Tx} Ps

Buyer's Loss $=$ S $C Dd Pd P$

Seller's Loss $=$ S $Bs C P Ps$

Thus TOTAL COMPENSATION MUST $=$ $Bs Dd Pd P Ps$

Govt receipts from $Tx =$ S $Bs Dd Pd Ps$

Social "Loss" $=$ S $Pd P Ps$

[$PFd \neq PFs$ are MRS curves]

W/ ② ABOVE $\exists$ Σ of ALL D-S CURVES

$\Rightarrow$ $\uparrow$ MRS w/ increase in Q of $\$$

$\Rightarrow$ higher compensating payment for buyers
but lower compensating payment for
sellers since ~~the~~ buyers are parting

w/ $\$$ which is becoming more valuable to
them as they part with it, while seller's

are acquiring $\$$ which
is becoming less
valuable to them
as it is acquired.

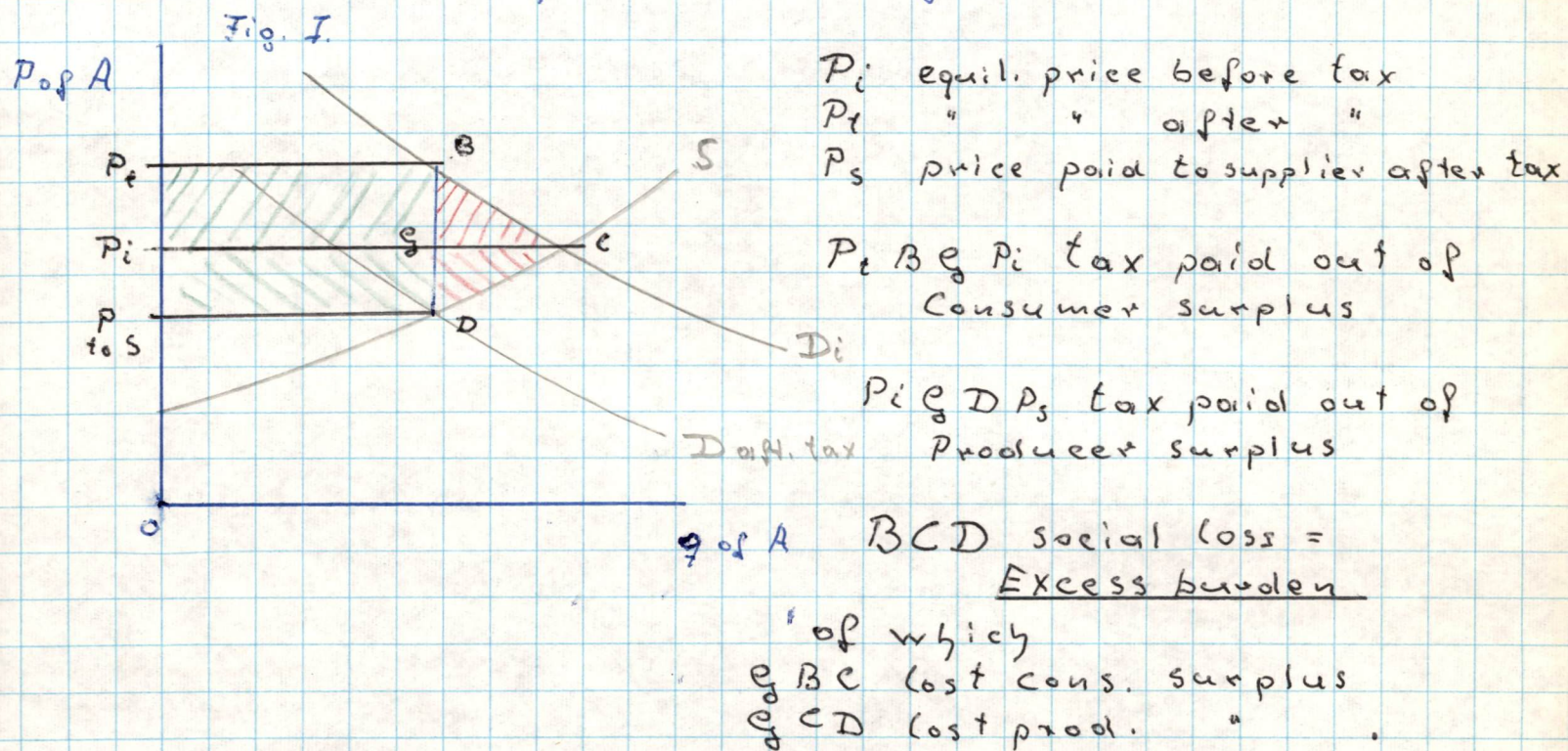
TOTAL COMP $=$ $Bs Pd Pd PFs$

SOCIAL LOSS $=$ $Ps Fs Pd Pd$

Excess burden of indirect taxation.

Assume: Excise tax levied on one commodity [A],
and passed on completely to consumer.

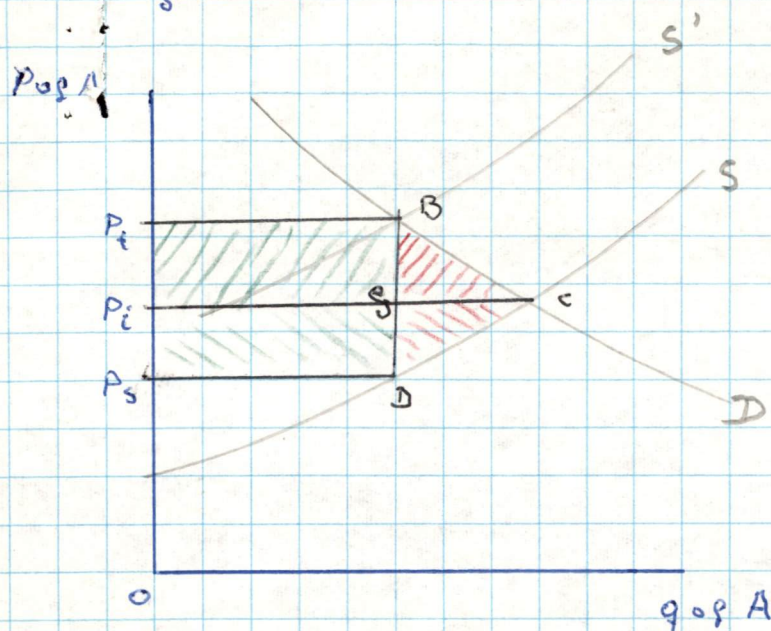
a.1, Simple case: Assume a shift of D-curve by
the amount of tax.



a.2, Consideration of the impact over a period
of time equal to the time needed for C-demand
to adjust to new price.

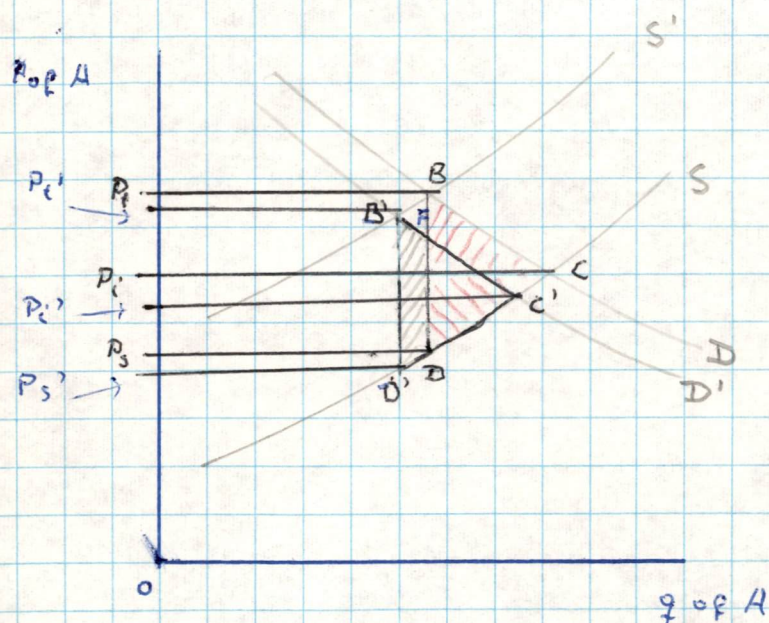
I shall at first shift the S-curve up-
ward by the amount of tax. However
this curve S_1 should not be confused
with S , which does not change for the
price is passed on to the consumer. S_1 is
merely to represent the new price level. The
first initial impact would be equal
to fig. I, only instead of decreasing demand
only q demanded will decrease.

Fig. II.



Results are the same as in figure I.

Now I assume that over a given period of time the demand-function will change. Since the tax is levied on one commodity people will use substitutes or change tastes thus changing D to D' .



P_t', P_c', P_s'
same as P_t, P_c, P_s only
after change in D .

Now the excess burden has been reduced from BCD to $B'C'D'$.

$$B'C'D' < BCD$$

$$\text{if } B'FDD' < FBCC'$$

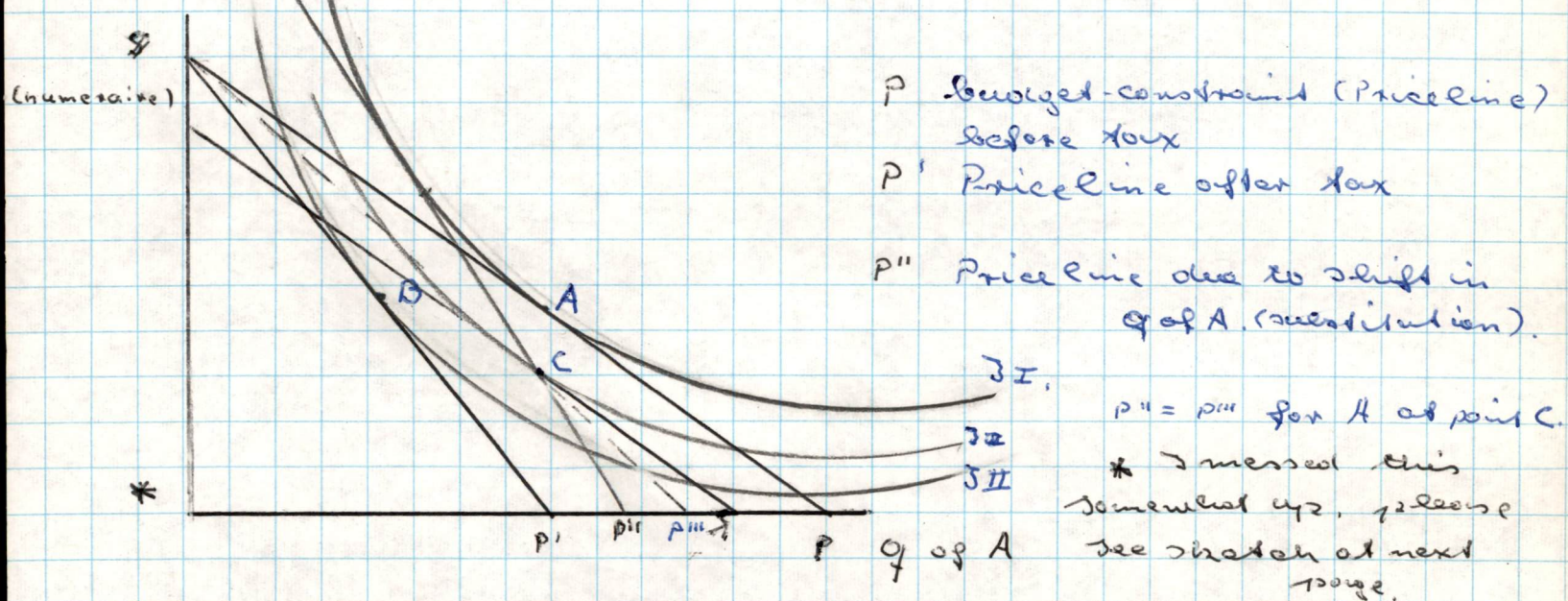
this may logically be assumed since otherwise consumers would shift their demand.

Thus the first impact of indirect taxation produces a greater excess burden which will be reduced by the consumer, adjusting to the new situation. Note: Govt. and Suppliers revenues

will also be reduced. However, in cases as mentioned in Baumol, where after a period of time the consumers will return to the old product, despite the higher price, but here, due to brownstones or lack of perfect substitutes we may assume that perfect competition did not exist, the opposite effect would occur.

b. / Indifference-curve analysis

assumptions same as in a.

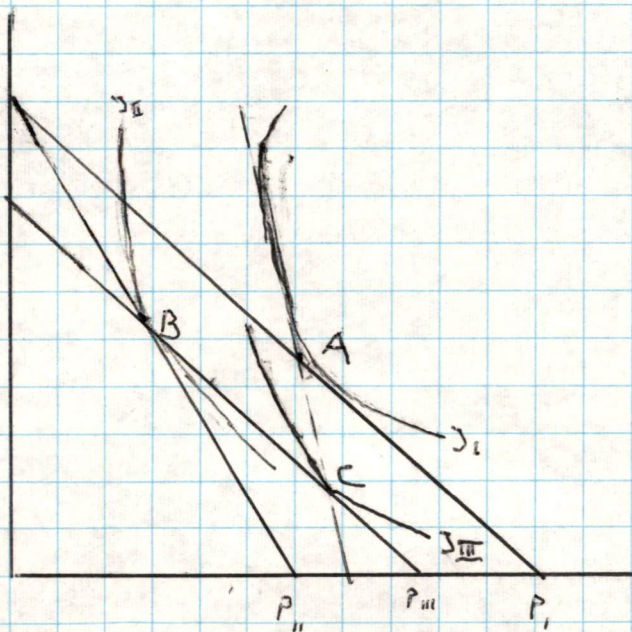


The first impact of the tax reduces the consumers real income from P to P' thus shifts his consumption of A from point A to B , that is from $I I$ to $I II$. Now, again, due to consumer adjustments (substituting other goods for A) the consumer will end up at a new equilibrium at C , at $I III$ which is $I III > I II$ but less than $I I$.

Here the excess burden of taxation is shown by the move from the higher utility level $I I$ to finally the lower level of $I III$. The least gain there might be from the tax is included in the numeraire but not visible.

Thus I think that Indifference-curves are not so well suited for this analysis because they

do not show us at all whether the social loss is paid out of cons. or producer surplus, nor do we have any idea about the relative size of the loss or of the Govt. gain.



4-29-64

1

Exam Review

1. —

2. —

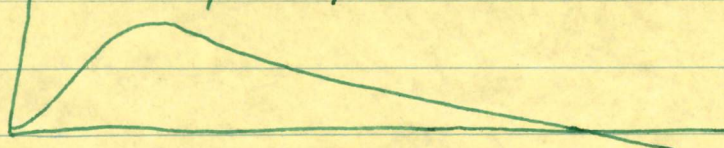
3. Euler

a. MNP method

b. New method (attached green sheet)

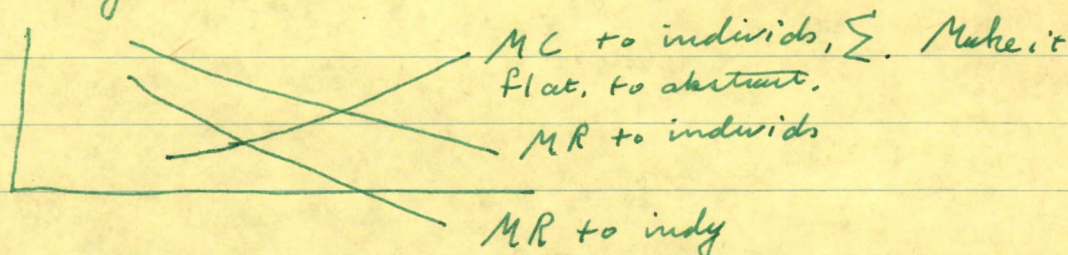
4. Open access res

a. Assume const. price, so $MR = MP \times \text{Price}$



b. Skip the Δq returns part of curve, hrs. have many small indep. units.

c. Regard indy as a whole



MR is less for prods. reasons, not price.

No true prods. Overuse of open-access res.

E.g.s.

Analogy - AB vs. AR vs. MR. Note many possible seemingly adequate & similar solutions.

Sp.

But only one is right!

5. ~~MR & MR~~ MNP & MP

a. Case of const. complements, they are identical. $MCC = 0$

b. At any point they are =, but factor prices
don't change.
Schedules diverge.

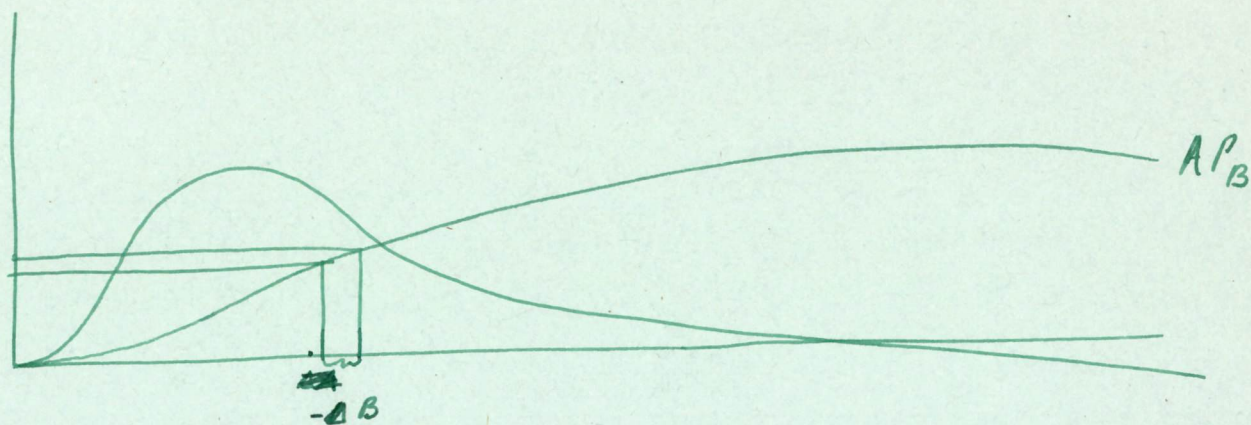
6. Why $MP_B = 0$ when $MP_A = AP_A$

Algebraic soln. not enough.

7. = M_{grd} .

ch. 13-15, Distr.
E. Rent.,

Proof of Euler's theorem?



$$MP_A = \Delta AP_B \cdot B$$

$$MP_B = AP_B - \Delta AP_B \cdot A = AP_B - MP_A \cdot \frac{A}{B}$$

$$MP_B + MP_A \cdot \frac{A}{B} = AP_B$$

$$B \cdot MP_B + A \cdot MP_A = TP$$

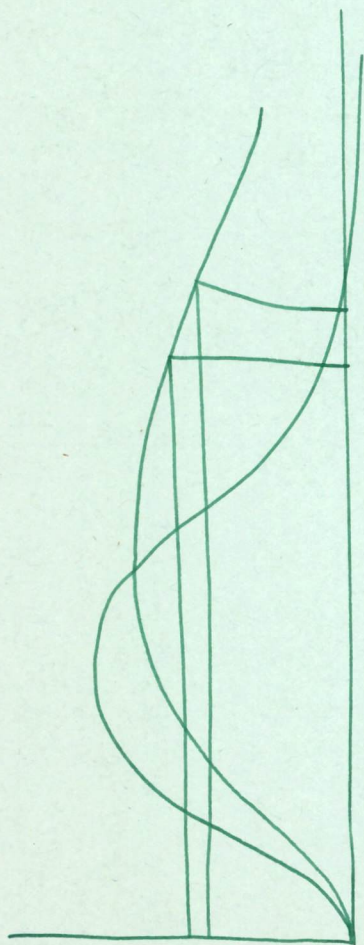
Select unit of B "equal" to unit of A?

~~X + ΔX~~

$$AP_{B_1} = \frac{X_1}{B}$$

$$AP_{B_2} = \frac{X_1 + \Delta X}{B}$$

$$\Delta AP_B = \frac{X_1 + \Delta X}{B} - \frac{X_1}{B} = \frac{\Delta X}{B} = \frac{MP_A}{B}$$



$$MP_a = \Delta TP = \Delta AP_B \cdot B$$

$$\frac{dX}{da} = \frac{d}{da} \left(\frac{X}{B} \cdot B \right)$$

$$\frac{dX}{db} =$$

$$MP_a = \frac{\Delta X}{\Delta A}$$

$$\lambda \text{ of } AP_B = \frac{\Delta X}{\Delta A} \div B = MP_a \div B$$

$$-\lambda \text{ of } AP_B = \frac{\Delta X}{\Delta B} \dots$$

$$\left[\begin{aligned} MP_B &= AP_B - \frac{AP_B}{e} = AP \left(1 - \frac{1}{e} \right) = AP \left(1 - \frac{\frac{\Delta X}{X}}{\frac{\Delta AP}{AP}} \right) = AP \left(1 - \frac{\Delta AP \cdot X}{AP \cdot \Delta X} \right) \\ &= AP_B - \frac{\Delta AP}{\Delta X} X \text{ etc.} \end{aligned} \right]$$

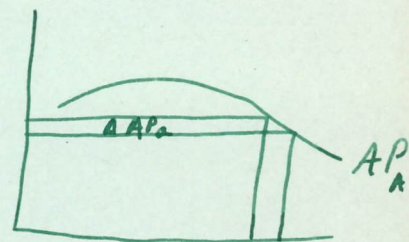
$$✓ MP_B = AP_B - \Delta AP_B \cdot B$$

$$MP_A = \Delta AP_B \cdot B$$

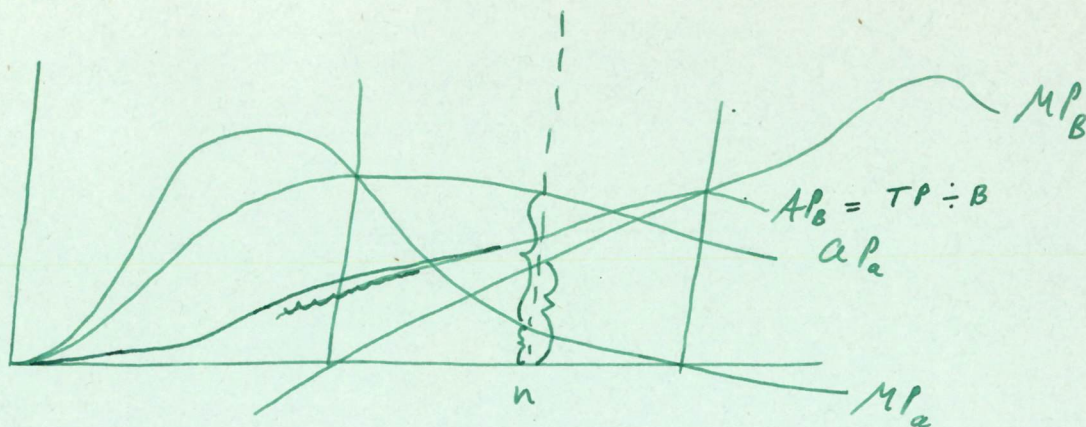
$$\therefore MP_B = AP_B - MP_A$$

$$MP_A + MP_B = AP_B$$

Not quite!



$$MP_A = AP_A - A \cdot \Delta AP_A$$



At any point, n , ${}_n MP_A = \Delta_n TP = \Delta_n AP_B \times B =$

$${}_n TP = \sum_0^n {}_i MP_A$$

$${}_n AP_B = {}_n TP \div B$$

At any point, $AP_A \cdot A = TP = AP_B \cdot B$

$$\frac{AP_A}{AP_B} = \frac{B}{A}$$

$$MP_B \times B =$$

$$MP_A = \Delta TP = \Delta AP_B \times B$$

No. To prove: ~~MP_A~~ $AP_A - MP_A = MP_B$; $MP_B + MP_A = AP_A$

May 16, 1966

1

Review.

1. Prodn. ecs.

Inverse selection of MP_s

Tendency toward = intensification of factor proportions.

$$MP = MNP$$

Terrane protection affects defn. of MP .

If you think you "own" the market, get $MVP < VMP$.

Of the 3, MP w. terrane protection is reps. net social value, net = π_c

Scale ecs. are matters of proportion

a. Too small is too small for indivisible inputs.

2. Cons. ecs. (Divisible & continuous)

b. Too large is too large for uninfatable inputs.

2. Cons. Ecs.

Cons. surplus.

Capturing c.s. may partly reduce it, if lowers p.p. of buyer -- a minor quibble, because turning it into major point

Elast. If c.s. is from derived demand, no reduction at all.

$$MR = P - \frac{P}{\epsilon} \quad \text{-- (know how to derive)}$$

Summing, = u of MR_s .

2 frs. of price: ration output, call forth supply.

TV, underused parking lots, etc., is no need to ration output, but

D.t. use of facilities w. temp. excess capacity... otherwise, always free except at peaks.
Land, v.v.

Cons. of fund vs. cons. of flow -- latter does not interfere w. others, unless congestion. Vertical summation of D curves.

Dim. m.u. Dubious philosophically, but is basis of ^{personal} inc. + ex.

Demand Turns out to be more elastic than studies forecast.

(El, power, H. Ford, Eng. devaluation, U.S. ag. policy, etc. ad inf.)

Consumer sovereignty -- cd. prevail in either free or socialist ec.

Read Lange

3. Factor Supply

Land.

- World aggregate, fixed
- Sectors, "mobile". Supremacy - but limited bcs. get worse quality
- Indl. Very mobile
- Jurisd. Fixed. So "Tax-elasticity" is 0, or even perverse.
- Minerals. At higher price, turn to lower grades, just as w. other land. Tax doesn't deter, bcs. lower ^{input} grades not used.

Tax-elastic. can always be 0 or perverse if tax rent, not margins.

Ricardo's "tithe" lowers supply. Also his "land-tax" on area.

"Public value". Capture spillovers. One of most important facts of welfare ec. E.g. of iron. project; or Green River C. of C.'s.

Anti-commercial tradition. One of hardest things to get people to see. Overlook v.c.

Indivis. in time. Credit instns. Abstract allow.

Labor

Backward supply response? Maybe. But inc. or asset effect is irrelevant to S curve.

Esply. re taxes, but all taxes have such effect.

Capl.

Also + S-response to inv. opps. At 0-int., no response.

Turnover is how one intensifies

Orig. factors get discounted MP. Capl. is resid. dominant.

4. Price.

Use notes of 3-28

5. Distribn.

Use notes of 3-28, from p. 6 on

6. Time.

Case of mines. How to max. p.v.

Universal formula, lump sum & annuities.

Tax Capl.

Diff. Capl.

Replmt.

Apprais.

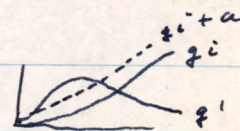
Max & mgtl approaches, same result.

Max. a same as max S

Max a, or i, or ~~a~~ joint -- just use right formula, $(C+S)(1+i)^t = g+S$

Repreis, & gmtl. (except mines)

Max. a by spread's costs over time; & revs.



Replmt. under decig costs.

1. Our line course

Chap. by chap., & supplements. One a week. Ass. Ch. 1 and supplements.

2. Review

a. Demand

i. 3 curves: AR, MR, & ASV (Ave. Social Value)

$$MR = P - \frac{P}{e} \quad \text{bcs.} \quad e = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} \quad \text{so} \quad \frac{P}{e} = \frac{\Delta P}{\Delta Q} \quad Q = ARQ$$

ii. e

$e \neq \text{slope}$

Unit elast. curve, const. product of coords.

Str. line, elast. keeps falling - & so does MR

iii. Time & demand curves.

They purport to abstract from it.

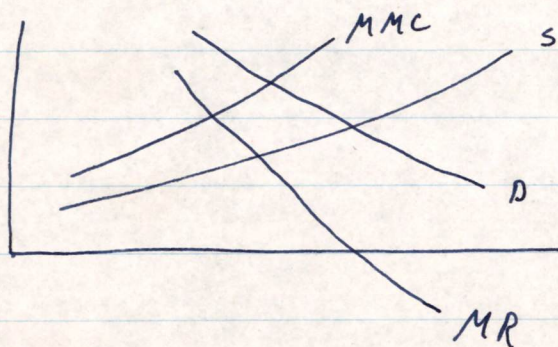
Best comit.

a. Depends where you start from

b. Irreversible - they are vectors, shd. have arrows.

3-28-66

- ✓ 1. The ultimate horror -- muppy & mupsy.



It's even worse when some other areas are too wide open, e.g. fisheries, hiways. Get too much effort there. Individ. $MP > SMP$, overlooking "external" congestion effects.

Or when govt. puts too much M into p.w. E.g. Norfolk, \$26. into tunnels, 10% as much into port. response. Tax exempt bonds.

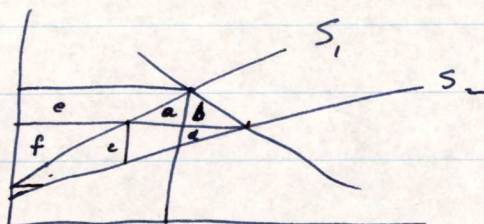
✓ Or when we levy ill-considered punitive taxes on mupst. as fun. of output. Thus ΔS & MMC curves, (or lower D & MR)

Very harmful. Price control is much better

- ✓ 2. Even worse horror -- series of mupst.

MR of last is demand curve for his supplier. Or at least ~~even~~ it helps shape it, makes it less elastic. Forces vertical integration.

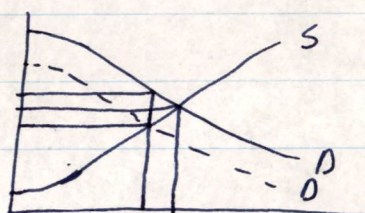
3. Gains from trade, new products, etc.



a. $S_2 - S_1$ is imports

b. ΔS is from new firm, or product, or technique.

c. Excess burden



Tax drives wedge.

Requisites: 1. Tax must be on one or output

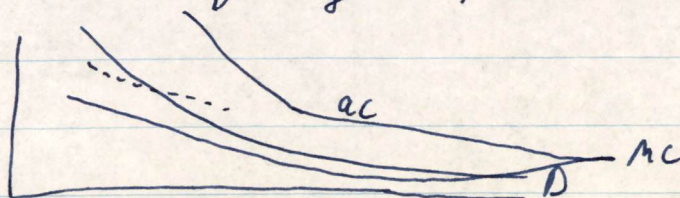
2. Elast. S & D

3. Tax shd. be partial, e.g. on one indy or product.

However, given unemployment, & elastic labor supply, any tax creates unemployment, however general.

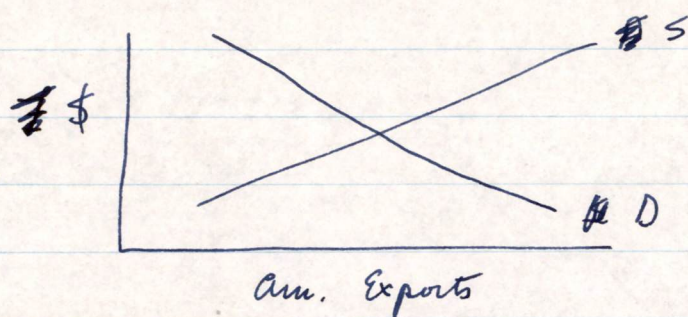
Keynes gave us concepts of highly elastic supplies of
a) Labor, and b) Investment. Others have said, pile on taxes of any amount, they'll absorb it. Keynes said no.

In case of Δq cost, double excess burden.



Power, phone, water, etc., big problem.

4. Terms of trade



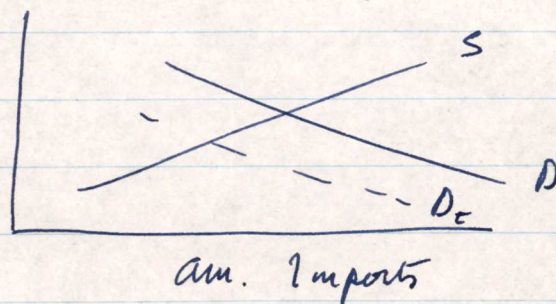
Why interfere w. Trade, if it is beneficial?

Muppy. Divert resources from competing w. Am. to compete w. foreigners.

Tariffs. Reduce supply of Am. exports.

Trouble is, also reduce demand for them, as furs. have fewer \$.

also, tax furs. w. tariff.



All very tedious. Better off w. free trade. But always have guys who like to control.

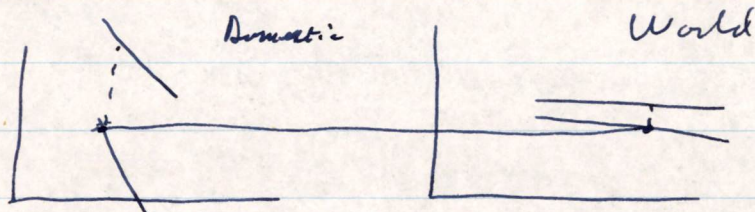
✓ 5. Dumping.

Why? Is at odds w. terms of trade idea.

Inconsistency is the essence -- they don't like people who ask qns., & try to fit pieces together.

Is like farm policy, scarcity vs. abundance.

Equate MRs.



Domestic mkt, less elastic demand, pay higher price.

World mkt, ^{bigger mkt.} more compn, elast. demand

Same reason you often buy cheaper in big city; or get better produce far from producing area.

✓ 6. Countervailing power?

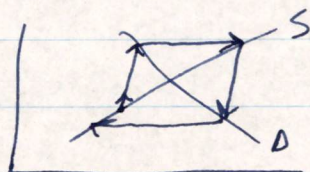
But firms don't just exploit those who were exploiting them, but everyone.

Result: more dispossessed. This thing we call the "negro" problems.

7. Cartel syndrome.

Fallacy of provocation. Inefficient. And brings in more.

8. Cobweb cycles from lagged response.



Failure of equil. mechanism. Assoc. w. time.

8½. Social cost of min. price control.

9. Vertical intr.

a. Cumulative inelasticity

b. Duplication of resource base. Autarky. Result of imperfect mkt.

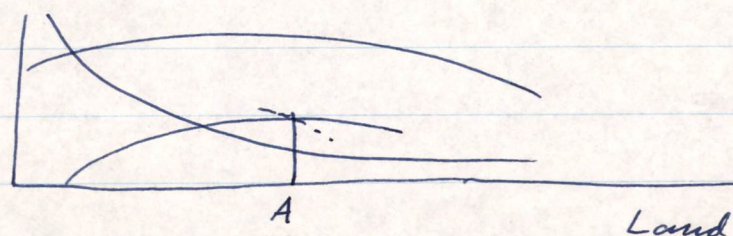
Classical ec. emphasizes folly of doing for yourself what others can do cheaper. But that only tells half the story.

✓ Every co. has to have its own mineral reserves. Lose benefits of pooling. Some have too much, but that is no assurance to those who have too little.

Cumulative nature of grabbing, once it starts. As each one retires his reserves from open mkt., forces others to do same. Cyclical

Distribution.

1. MP inputs parts of TP to specific inputs.
2. Need Euler.



At A, all inputs get MP

Land gets AP , as residual. But $AP = MP$

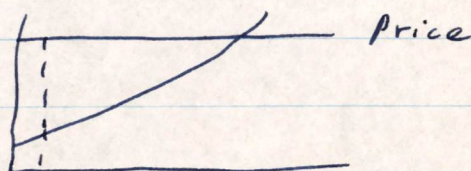
3. Capl. & Time.

In practise, capl. absorbs shocks.

Bus. has no o.c.

4. Rent vs. other costs

a. Producer surplus



b. General

Price in Terms of human effort. Price of all goods

(As it falls, is same as wages going up on MP graph)

Rent, not "social" in sense repr. no human effort.

* The resource wd. be supplied w/o reward.

5. Something for nothing, etc. So distrib. equity & alloc. effic. are very counterparts.

6. Instl. tendency to ~~allow~~ ~~allow~~ sacrifice allocation effic. to distr. equity. Unfortunate.

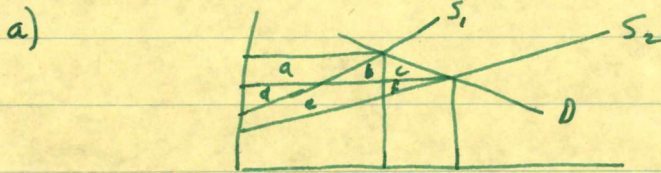
e.g. French inheritance.

e.g. U.S. postage stamp pricing

3-18

Start papers. Reading Coming

✓ 1. Gain from trade again. (oversimple - black & white, trade vs. no trade; may do better yet by manipg. terms)



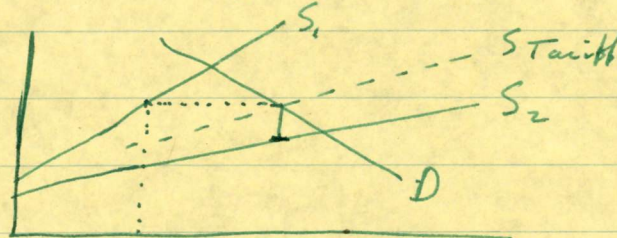
b & c are net gains to importer nation. (or co.; or division of co.)

d, e, & f are producer surplus; d preexisted; so e & f are net gain to exporter

b) Is Δ gain. Δ demand for our exports, bes:

- i) Fn. res. diverted to sell to us, on S_2
- ii) Furs. have more \$
- iii) U.S. res. diverted from S_1 for export — ^{thru} several rounds

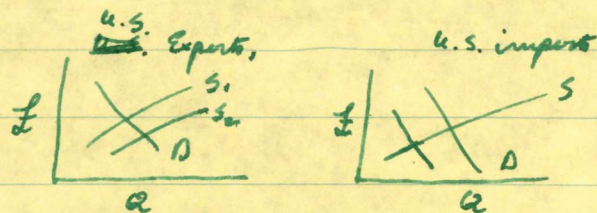
c) Can do better yet by depressing our demand for imports by tariffs.



Which is why we don't have free trade.

2. Box diagram doesn't show it well, even tho is bilateral

✓ 3. Suras of devaluation



J. Robinson's error. Importance of labelling axes.

4. Effect of units on curves.

Demand curves, unit is output

Cost curves, " " " "

$\therefore$, use them together

Product & revenue curves, unit is input. Recip. of cost curves.

4 $\frac{1}{2}$. MRP curve of buyer is demand curve for seller. E.g. power. Makes

5. Loss of output from monopoly - monopoly. "cons. surplus." less vague.

Moved in l.v.

Cum. inelast.

MVP_a is AR_b

MR_b is AR_c , or determines it.

Hence need for vert. int.

6. Cartel syndrome.

7. Cumul. inelast.

Mon., Feb. 28

Cons

1. ~~The~~ Class next week. 1 away, but
 - a. Short exam
 - b. Everyone talk 5 mins. — make & defend a point.Bossard in charge.

2. $MR = P - P/\epsilon$.

Diversion & dumping

Benchmark values of ϵ .

Relative ϵ of large & small. Depends on costs. Those w. idle capacity, & interlopers, cut p .

3. Cons. of fund & of flow. In case of flow res., cons. is output!
But input goes on, regardless of output.

- 4. Inferior, superior, & Giffen goods.

Preference for durable goods rises w. income, wealth, etc. Roid, Gottlieb.
Lower time-pref. Maybe good way to make dim. m.u. objective? Good way to tax — Δ tax w. durability? Makes more sense than w. income — one may want it all right away.

- 5. Allegation of inelasticity of demand to price.

E.g. in ag. pol.; by all mapsts; by anti-devaluationists.
They're nearly always wrong. (Unless they mean better quality instead)
But that is why price theorists talk substn. so much.

Weakness to underst. elast. E.g. of electr. power. H. Ford.
Etc.

6. "Ec. man". Doesn't buy cheapest lunch.

Ec. man not pecuniary - sacrifices M for things he values more. Just uses M to balance.

Ec. man not materialistic. Direct pleasure the object.
Money is a means to the end.

Factor Supply

Land.

1. Elast. of supply. Depends what you mean.

Important. - claims it makes good tax base; & measures spillovers.
Several senses.

a. Aggreg. in world.

~~Intens~~ Δ intensity $\equiv \Delta$ supply.

Δ power $\equiv \Delta$ supply. Δ popn. gives it to urban land.

Specialization, exch., invention.

b. Sectoral. E.g. urban. Take from lower uses.
Same effect as Δ supply. But limited - get far from core of city.

c. Indl. E.g. steel. Hi elast.

d. Jurisdct. Fixed. Can take entire rent.
Problem is reverse of usual - Δ effective supply.

e. Minerals. (Will return under "Time")

Can socialize much rent, not demotivate expln.

1. Much needs no funding
 2. Tax prediscouraging values
 3. Public expln.
 4. Letting finder have full rent over motivates prospect f.
- Read from paper

2. Immobility of land - how important?

3. "Public value"

4. Anti-commercial traders.

5. Credit instns. obstruct allocn. $\frac{MR}{P} = i + \frac{\Delta P}{P} + t$

Better allocn. is like 1 supply.

6. No-rent margin. No other factor has one. Tax on rent = 0 there, so no effect on supply.

7. 2 meanings of rent: Ricardian & Transfer. Transfer rent rubber; also, is a micro concept, while Ricardian is macro. Land enjoys no leisure; labor does.

8. Rent & "differential" aspect. If there is always input, land = 0, there must be a differential

9. Constraint on space & time.

~~Labor. Backward bending supply? Is unemployment? Voluntary?~~
~~"Sticky" wage rates imply on elastic supply of labor~~
~~Response v. inst. curve. Inc. effect is irrelevant, only substit. effect.~~
~~Lower wage, or tax on wages, is not to be judged by~~
~~"inc. effect" bcs. there is more net. People get more from property.~~
~~If tax wages, gives more govt. services, they offset.~~
~~Upshot: + elast. of supply.~~

Capl. (more under "Time")
Macro.

+ response to Δ inv. opps. O -interest.

Non-coords. of factors. Wicksell. Bears orig. factors over time. Residual imputer.

In response to higher yields, capl.: a, Immigrates; b, Turns faster

Go onto price eqs. if time.

3-9-64

0 2

stock those things most desired by them personally.

~~was~~

5. Entry & mobility.

Meaning? Can't bring more land into cld; can't add to no. of neighbors from whom expand. Etc.

a.] ✓ Yet, is remarkable to see what works in long run: "scarcity breeds substitution." History is ~~the~~^a graveyard of suicide monops.

e.g.: Stephenson rubber plan; Ts. oil prorata; Calif. cling peach green drop; milk marketing orders

B.] Comment on point discussed Mem.

a. Why earn 5% when you can earn 10? Going to 5 doesn't mean you aren't making the 10, but are going beyond it, bcs. you can buy the input (i.e. borrow money) for 5.

¶ If you are really making 10, then expand yr. ops. make 10 or more bcs. until yr. borrowing rate rises, or input. return falls.

But Bldg. wasn't really making 10, was arrogating. Made 0 on land. Return on joint assets is below max., approved by Fauston.

Can do a great deal w. demand curves. Econ. went 11
is for indiff. curves long before they got the good
out of demand curves.

Topics re demand

0. Movement along a curve vs. shift in curve.

1. Several kinds demand curve.

a. Curve reps. what wd. happen at an instant. cfr. static.

Tends to be very inelastic - shorter than s.r.

b. "L.r." d. curve is more a response curve

Is a vector - not exactly reversible.

Add "time-elast." Response curve is more elastic; & elasticity is fn. of time.

t $\frac{1}{2}$ of response. Most empirical elast. studies are instantaneous - hence misleading

2 ideas

Most demand curves are a commonsense compromise between

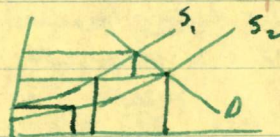
c. AR is a mgul. benefit curve, applns of ave. benefit curve.

MR - effects of price control: no more MR. Results can be good.

Mut. wnt. vs. cet. par. vs. macro-economic. Tmplicit collusion comes from looking at selected small group.

d. Gains from Trade

Applns. in p.w. ecs.; innovation only.

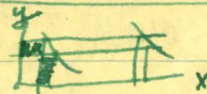


Add another gain - Δ Demand for our exports, as fr. res. diverted

d $\frac{1}{2}$ (over) e. AC, MC, and MR to producing for us. Neglected
Loss of output due to monopoly } arg. for unilateral free trade.

Cartel syndrome } f. Better res. more likely to be mapped / scarcer & in "stronger" hands.
Cartel syndrome. "Capital roll out." (over)

Role of differing demand elast.



$$\frac{\Delta Q}{Q} \div \frac{\Delta P}{P} = \frac{P \Delta Q}{Q \Delta P} = \frac{y}{x}, \text{ a fn. of } \lambda \text{ \& position}$$

g. Cumulative inelasticity. A $\searrow$ B, demand is MR of A.

h. Excess burden of taxes ; i. Taxing firms, or terms of trade

See if they
are spot
fullage

d & $\frac{1}{2}$) Why can't you put together MR - AR curves & demand curves to find $=$ output? E.g. where $MRP = \text{price}$?

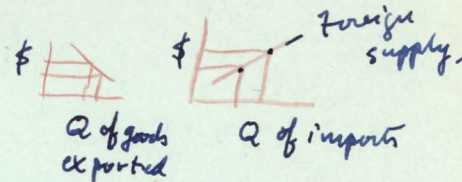
Some wider aspects of mmpy. They have money to invest. So they seek out lets not competing w. their present output:

- a) Develop new products. Hence, bias in R & D; hence excessive diversification esp. where credit rating helped thereby.
- b) Preempt new areas. Esply. where prescriptive rule applies; & a fortiori where ^{max} prices are enforced, but "costs" are allowed — e.g. utilities; & a fortiori again where preclusive & preemptive aspects.
- c) Exploration. Esply. where tax subsidized
- d) Compete w. trading partners. Vertical integration

→ a.) Mmpy cannot just keep out res., usually. That drives them to competitors. Must hold them or divert them.

e.) Invest money in very durable goods, slow payout ... divert production into future. Esply. if the mmpy. is publicly sponsored, like agric. Principle of deferred retribution. Build up excess capacity.

j. Elast. & the success of devaluation



k. E.g. of perfectly elastic & inelastic demand curves.

1. Land. Importance of careful defn.

2. Fallacy that inelastic demand means repeal of law of $s \& d$.

3. Competitive firms.

✓ l. = inqul. princ. of demand — or anything.
p. 21

"Fallacy of proportion" [cut backs]

✓ m. Inc. elast.

X elast.

✓ n. Equating m.r. in Walras — abuse of = inqul. princ.

✓ o. Vertical addition of indiv. ^{demand} supply curves — community goods.
Lighthouse; public health officer; pub. lib.

✓ p. Bonnick's ~~case~~ dis.

Is inelast. demand necy. to refute case for mpy?

No. The more good mpyt. can do himself, the more he hurts consumers. Social damage is max. at moderate λ

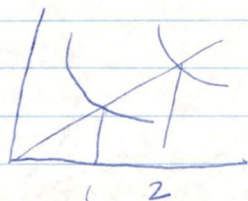


But depends too on how supply is controlled. Ag. is exactly wrong — so are most cartels. Max. ant.

Balman, Prodn. fns.

1. Homog. (means $\alpha + \beta = \text{const}$, might be $\neq 1$.)
2. Const. elast. of sub.

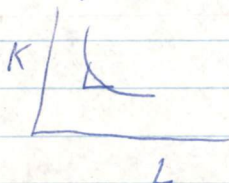
$$1. Q = t^{\alpha+\beta} = A(tK)^{\alpha}(tL)^{\beta} = A t^{\alpha+\beta} K^{\alpha} L^{\beta}$$



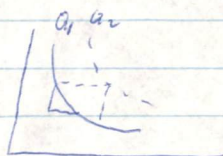
2. Cobb-D. fns. don't have to be homog. of degree 1, but often are of degree one, i.e. $\alpha + \beta = 1$

3. Re const. elast. of sub.

3. MRS



$$\frac{\Delta L}{\Delta K} \equiv \text{MRS of } L \text{ for } K$$



$$\frac{\Delta Q}{\Delta K} = \text{MP of } K, \text{ etc.}$$

$$\frac{\text{MP}_K}{\text{MP}_L} = \text{MRS of } K \text{ for } L \text{ (or } L \text{ for } K?)$$

$$e \text{ of sub.} \equiv \frac{\eta_Q \Delta \frac{K}{L}}{\eta_Q \Delta r} \quad (r \equiv \text{MRS of } L \text{ for } K)$$

The assumption of const. elast. of sub. was challenged by Asens, Arrow, Chenery, et al.

$$\alpha = \frac{\text{MP}}{\text{AP}} \text{ of } K, \text{ etc.}$$

$$MP_L < a \cdot AP = a \frac{q}{L}$$

$$a \frac{q \cdot P}{L} = W (\text{wage rate})$$

$$a = \frac{W \cdot L}{q \cdot P} = \text{labor's share (cf. Wicksell)}$$

Douglas said labor's share = .63

(And never a finite to Wicksell!)

$$4. \log Q = \log A + \alpha \log K + \beta \log L$$

$$\Delta \log Q = \alpha \Delta \log K$$

$$\alpha = \frac{\Delta \log Q}{\Delta \log K} = \frac{MP}{AP}$$

5. Cite Paglin

6. Show purposes & uses of prodn. fns.

Economic Size of Organizations

Do managerial inefficiencies always result from increased spans of management or organizational levels, or are offsets available to prevent the diseconomies of large size?

✿ THE ECONOMIST'S INTEREST in management is primarily focused on the question of the size of the firm. The focus of this article is on the effects of organization size on the efficiency of management as reflected in the total unit costs of production. It is commonly claimed that one of the indications of lower managerial efficiency resulting from increased size is a more-than-proportionate growth in the administrative component.¹ If the process of management does indeed have finite limits, management would provide the fixed factor causing the firm's long-range cost curve to slope upward beyond a certain output. This U-shaped long-run cost curve is necessary for equilibrium under the concept of perfect competition and helps to explain the predominance of small- and medium-sized firms.

The rationale for the proposition that management is a limiting factor can be based on the following arguments:²

♦ Total expenditures in time and energy are limited for each individual. There are also finite limits on the number of things to which an individual can direct his attention at any given time.

♦ In an organization, the limits imposed by time,

energy, and attention spans are reflected in limits on the number of subordinates that a manager can effectively supervise. This limitation is called the **span of management**.³

♦ As output and personnel resource requirements increase, the limits imposed by the span of management result in increasing the number of levels in the organization. This scalar chain of superiors, ranging from the ultimate authority to the lowest ranks, cannot be indefinitely extended because of the additional and more complex communications that become necessary.

♦ The extent to which both the width of the span and the length of the scalar chain are limited imposes restrictions on the total size of the organization.

I will attempt to show that, although each of the above may occur, there are devices available to the manager to offset these effects. With the existence of these offsets, diseconomies of size (i.e., eventual increases in the unit cost of production) are not **inevitable** from the standpoint of management theory for those scales of production that are found in reality.

Human Engineering

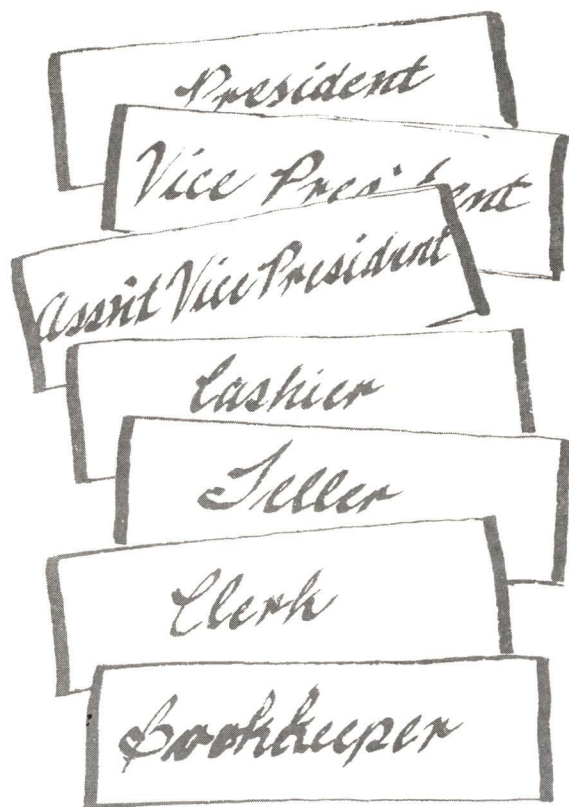
The span of management. The existence of finite capacity span provides the foundation for the span-of-management concept. It has been shown that the average person can retain and repeat back only about seven unrelated digits. There appears to be a finite span of immediate memory that approximates



Edward A. Nelson, a specialist in the economics and management of data processing, has over fifteen years of experience in industry. He is with the Systems Development Corporation.

about seven items in length for various test items; also, there is an average span of absolute judgment that can distinguish about seven categories and a span of attention that will encompass about six objects at a glance.⁴

It is not suggested that, because the "human engineering" limitations on the number of items a manager can observe at one moment appear to be about six, the number of subordinates he can supervise is, therefore, also limited to six. The supervision of subordinates and the recognition of objects are obviously different kinds of tasks. Yet, there are direct analogies and common causal determinants for the span of management and for psychological phenomena such as spans of attention.



Since a manager, as a functioning human organism, is limited in the number of things that he can do at any one time, he must organize his workday so that the amount of things that require his attention can be done in some reasonable sequence. But, since the time available and the manager's energy are also limited, so must be the total number of tasks that a manager can do. How does this specifically relate to the number of subordinates that a

manager can effectively supervise? Graicunas⁵ suggested that the tasks of a manager involved dealing with (i.e., coordinating) the various subordinate-superior relationships that arise in an organization. Considering single relationships between the supervisor and any combination of two subordinates, and cross relationships between any two subordinates, Graicunas arrived at the following formula to represent the difficulty of a manager's job as a function of the number of subordinates:

$$R = s\left(\frac{2^s}{2} + s - 1\right),$$

where: R = number of relationships a manager must coordinate and s = number of direct subordinates.

The significance of this formula lies in the geometric progression that it represents. Thus, if a manager has 4 subordinates, he deals with 44 relationships; 8 subordinates produce 1,080 possible relationships; and 16 subordinates 524,534 relationships!

The Graicunas formula understates the problem in that cross relationships can also occur with combinations of more than two subordinates at a time, that is, with four subordinates reporting to one supervisor; there are also four ways in which groups of three subordinates could interact, etc.

On the other hand, the severity of the problem is overstated to the extent that the nature of the business of the organizational environment may make many of the mathematically possible interrelationships unnecessary in actual practice. Thus, the actuary of a life insurance company may have much more daily contact with the controller than with the agency director, even though all three report to the same executive. This effect, recognized by Graicunas, is expressed as the "Principle of Interlocks" by Urwick: "No superior can supervise directly the work of more than five or, at the most, six subordinates whose work interlocks."⁶

Yet it is not only the existence of work interlocks, but also the frequency and severity (the amount of attention each requires) of the relationships that result,⁷ that determine the difficulty of the manager's task of coordination. We may quibble about details of the Graicunas formula, but the principle that the potential for inefficiency increases geometrically by some similar relationship as the number of subordinates is increased is difficult to escape. This is to a large extent an information-processing

problem,⁸ but it is more than this for the span of management, since the mere existence of work interlocks can create situations that require coordination.

If we are to offset such difficulties, we must find means for reducing the frequency and severity of the relationships between the superior and his subordinates.

Sources of Inefficiencies

The lengthening scalar chain. Some writers have maintained that the principle of minimizing organizational levels contradicts the requirements of the span of management and, hence, illustrates the inadequacy of both principles in application.⁹ The issue does pose a dilemma. If a small span is desirable, the number of executives and probably the number of levels between the chief executive and

the operating employee will have to be increased. One purpose of specifying more precisely the factors and offsets that influence the relative impact of these two countervailing principles is that individual situations may then be analyzed to determine the best compromise.

An organization of a given size can be constructed using various spans or numbers of levels (Fig. 4).¹⁰ But extending the number of levels indefinitely may result in inefficiencies arising from three sources:

- Socio-political factors.
- Communications.
- Costs of additional management personnel.

Socio-political factors. There is a currently popular emphasis on the social aspects of organization by some writers.¹¹ The length of the scalar chain, the span of management, or the absolute size of an organization may indeed have an effect on the

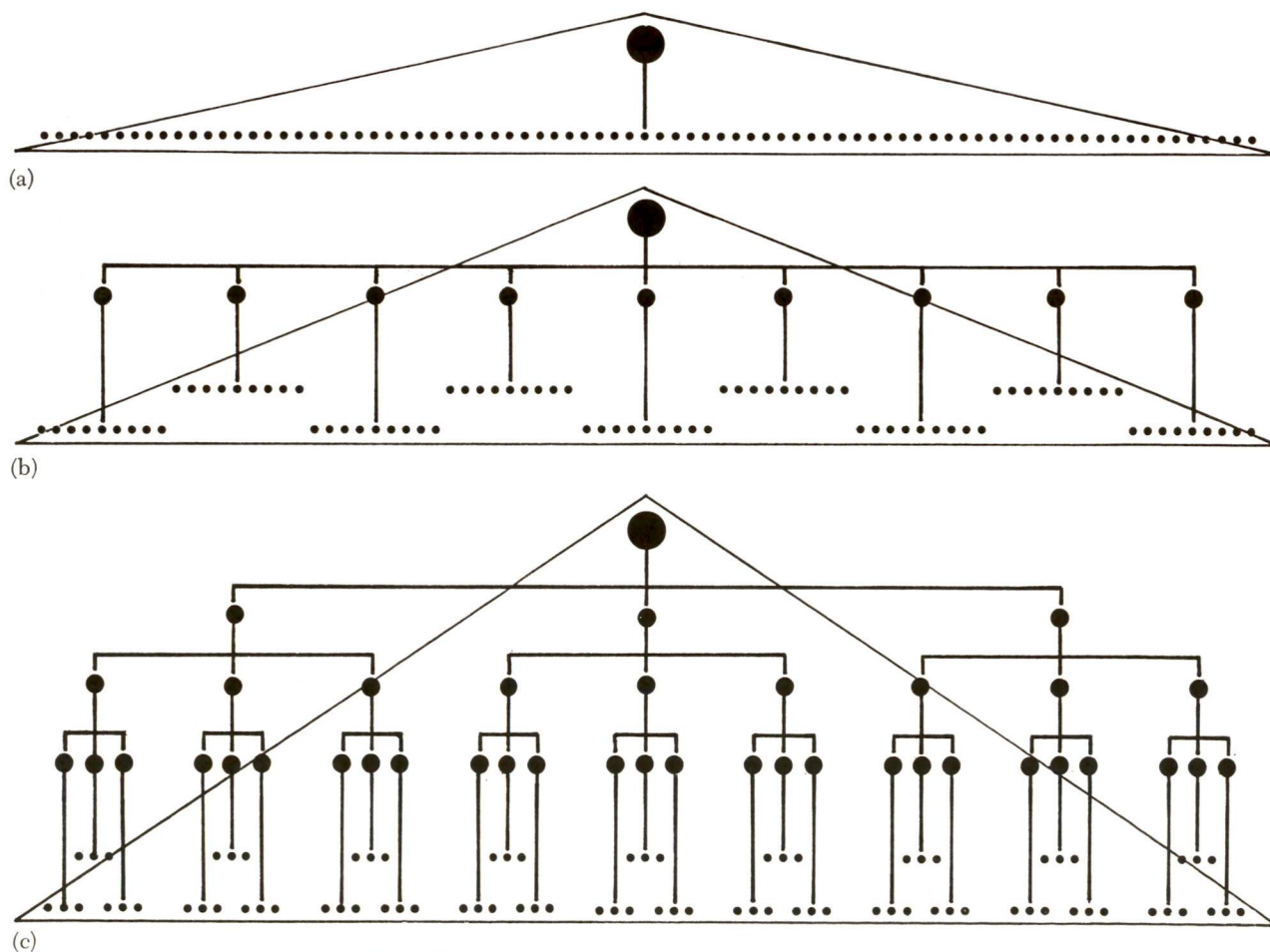


FIG. 1.—DIAGRAM OF DIFFERENT SPANS OF MANAGEMENT
 (a) Span of 81 per executive: 1 supervisory level, 1 executive
 (b) Span of 9 per executive: 2 supervisory levels, 10 executives
 (c) Span of 3 per executive: 4 supervisory levels, 40 executives

morale of its members which could in turn influence efficiency. Therefore, this possibility should be mentioned, but these factors are not yet clearly understood. It has yet to be shown that a long scalar chain or a broad (or narrow) span of management necessarily creates an adverse psychological environment. However, the issues and countervailing forces in individual or group psychology are beyond the scope of this paper; aside from this brief recognition of their existence, further elaboration on this point will not be attempted.

Communications. Extending the length of the scalar chain may cause problems in communication because "contact between organization members (may) be carried upward until a common superior is found and then downward again in the form of orders and instructions—a cumbersome and time-consuming process."¹² If, on the other hand, a decision can be made without traveling very far up the scalar chain, higher levels of management may be unaware of what is happening within their area of responsibility.

Span of management and length of scalar chain limitations both deal with communication, but from a different point of view. Where span of management is concerned with the saturation of the manager's capacities because of the frequency and severity of communications, scalar chain limitations arise because of impediments to the flow of information. These impediments may result in inaccurate or distorted information (intentional or unintentional); lack of important information at the higher echelons of decision; excessive time lags in obtaining information resulting in inflexibility or missed opportunities; and problems and delays in explaining and selling the decisions that have been made.

Costs of additional management personnel. When the span of management is reduced, the number of supervisors required for a given work force is increased, as illustrated in Figure 1. The added expenses created by these additional supervisors and the office space and secretarial and other support personnel required would have to be justified by at least a proportional increase in the productivity of the employees supervised. If this increase in productivity is not forthcoming, lengthening the scalar chain will obviously increase the total unit costs of production.

The interesting thing about the costs of additional management personnel, from the standpoint of

the contribution of this factor to possible diseconomies of large size, is that the factor has its greatest impact on the smaller firms!

If we measure this impact by the changes in the ratio of the number of supervisors to the total number of workers, and if we assume that the same span applies to supervisors at every level and that the organization contains the maximum total of employees mathematically possible for a given span and number of levels, we arrive at the following relationship:¹³

$$R = \frac{\text{Total Number of Supervisors}}{\text{Total Number of Workers}}$$

$$= \sum_{i=1}^{n-1} S^{n-i-1}$$

$$= \frac{S^n - 1}{S^n - S^{n-1}}$$

where: S = span of management (maximum number of employees reporting to each supervisor), and n = number of levels of supervisors (see Fig. 1).

The results of this relationship are shown in Figures 2 and 3 for several values of span and numbers of levels. Except for the comparatively trivial case of only two people reporting to one supervisor (see Fig. 2), the change in the ratio of supervisors to workers is small when we go from two to three levels of supervision and totally insignificant for levels of supervision beyond three, regardless of which span we are using! Likewise, Figure 3 illustrates

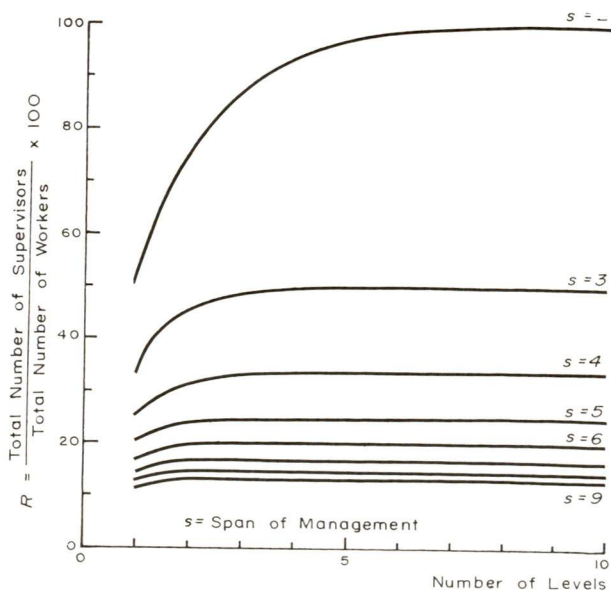


FIG. 2.—RELATIONSHIP OF PERCENTAGE OF SUPERVISORY PERSONNEL TO WORKERS VERSUS NUMBER OF LEVELS OF ORGANIZATION

that this ratio is primarily a function of span, not levels, with the number of levels being most important in the lower ranges, i.e., for the smaller firms. Furthermore, the relationship of management cost to span is a negative one—the larger the span, the less the total average unit costs for supervision.

Since the restrictions created by the number of levels or coordination by socio-political factors are at best tenuous, and the impact of the costs of additional management personnel becomes less important as an organization gets larger, we are left with the second factor. The primary tangible reason for an adverse effect on efficiency resulting from increasing the length of the scalar chain must stem from problems in the flow of information.

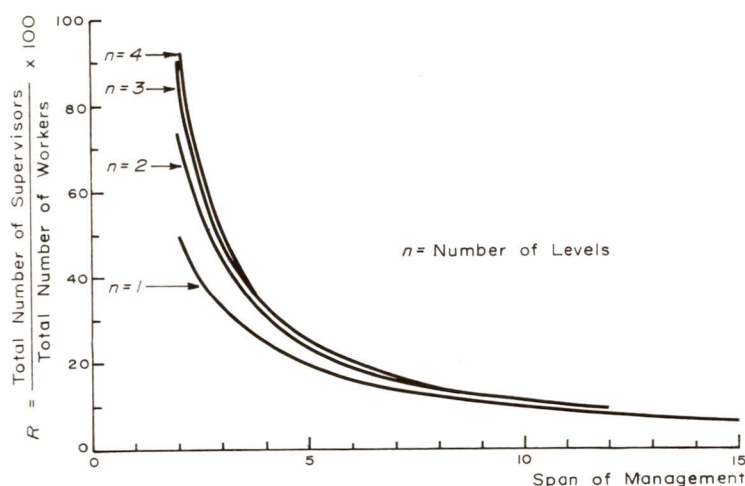


FIG. 3.—RELATIONSHIP OF PERCENTAGE OF SUPERVISORY PERSONNEL TO WORKERS VERSUS SPAN OF MANAGEMENT

Reducing Limitations

Offsets to span and scalar chain limitations. The mechanisms that would generate limitations on the span of management and the length of the scalar chain operate primarily by:

1 / Affecting the frequency and severity of the interaction required between a manager and his subordinates.

2 / Affecting the flow of information up or down the scalar chain.

But there exist a number of factors that could have an important influence on both of the above and, hence, on the span or depth of organization

that could be tolerated in a given situation without loss of efficiency. These factors are listed below and discussed in terms of their value as offsets to span and scalar chain limitations.

Both the frequency and severity of interaction, as well as the flow of information required in an organization, can be profoundly affected by the dynamics of the "business" in which the organization is engaged. The Roman Catholic Church, for example, has demonstrated a remarkable stability and durability over the centuries with a very wide span of management, partly because changes in policies, procedures, and objectives have occurred slowly. Likewise, the amount of personal contact required by managers, both inside and outside of the organization, and other duties such as community projects, professional meetings, and conferences will vary by the type and purpose of the organization and the complexity of the business and will have an important bearing on communications and the attention available for the managerial functions.

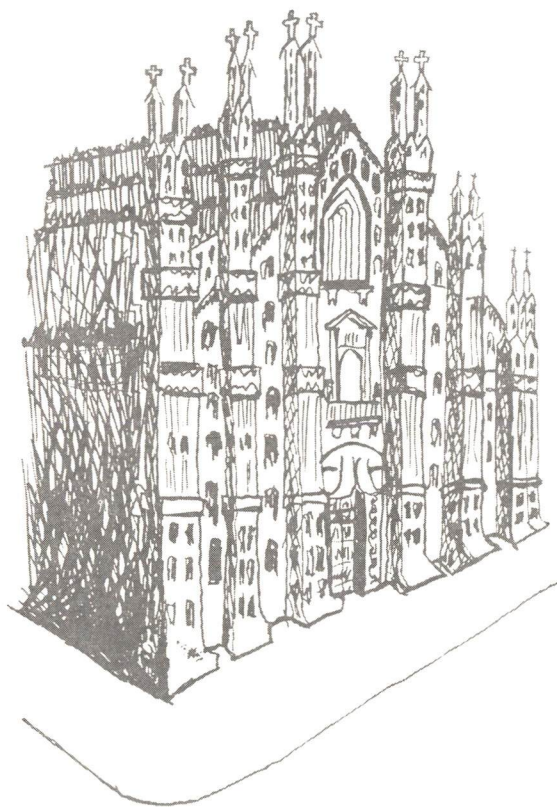
Although the dynamics of the business, the intricacies of a particular product line, and the amount of personal contact that is inherent in the nature of some specific operations may indeed exert a strong influence on the acceptable span of management and length of scalar chain for a specific organization, these factors are not a part of our list of offsets. This exclusion permits a listing of offsets that are more directly subject to the discretion of management and, hence, more germane to a general treatment of the hypothesis that diseconomies of scale need not necessarily exist.

In any organization, management may employ various combinations of the following factors to decrease the frequency and/or severity of interactions between the manager and his subordinates or promote the flow of information between the levels of the organization:

- Subordinate training.
- Planning.
- Delegation of authority.
- The "gangplank" principle.
- Objective standards at strategic points.
- The staff device.

- Right versus use of direct access.
- Technological developments.

Subordinate training. It should be self-evident that the better the subordinate knows his job, the less guidance he will require from his superior and the less coordination between the subordinate and his associates will be necessary. But the importance of training extends beyond instruction in the technical or procedural aspects of a job. Training can also be a valuable aid in securing a prompt response from a subordinate when he is told what to do. The hours spent by new recruits in military drill exercises are not intended only to make the regiment look good at the victory parade; the purpose is that the recruit experience direct physical coordination with his comrades in, and acquire a conditioned response to, the issuance of an order.



The success of the Catholic Church as an organization, in spite of its wide span of management, has already been partly ascribed to the slow rate of change to which the organization must respond. But this ability to manage with a wide span must also be credited to the elaborate guidelines for decision and action that have been established (the factor to

be discussed next) and the years of extensive training required of the ecclesiastic. The importance of training to span of management is also attested to by the fact that many authorities¹⁴ attribute the existence of larger spans at the lower levels of organizations partially to the greater difficulty of discovering what to teach at the higher levels of management and how to teach it.

Besides its impact on the span of management, training can help to extend the scalar chain in several ways. First, a thorough understanding of policy and objectives "prepares the organization member to reach satisfactory decisions himself, without the need for the constant exercise of authority or advice";¹⁵ this reduces the need for information flow between levels. Second, this understanding can help to assure that information that would be useful at higher levels is recognized and properly forwarded. Likewise, training in the art and use of the means of communication, whether these media are memoranda, oral presentations, or sophisticated data-processing systems, or training in the arts of communication per se can contribute substantially to the efficient and effective flow of information between levels.

Planning. The thoroughness of planning and the clarity of goals and policy, when combined with the authority to act, reduces the need for communications. Thus, the shop foreman in a production operation where procedures and production requirements are precisely known can generally supervise more workers than can his counterpart in a job shop.

On the other hand, when plans are not precise and require periodic new decisions or elaborations, or when plans are changed frequently, there is necessarily more interaction between a superior and his subordinates. To the extent that these interactions affect other levels, the information flow along the scalar chain can also be increased.

One of the direct benefits received from the growing use of electronic data processing (EDP) has been more thorough planning, since the automation of a procedure requires an attention to detail and to objectives.

Delegation of authority. "The most serious symptom of poor organization affecting the span of management is inadequate or unclear authority delegation."¹⁶ Actions not specifically covered by plans must be coordinated with the supervisor

when the subordinate does not have the authority to act on his own initiative. This produces a frequency of interaction that is a direct function of the number of problems that arise, which are, in turn, directly related to the size of the organization's output. Thus, the limits of managerial attention could be exceeded very quickly as output expanded, and if a manager were given additional subordinates to handle increased output, the result would be the classical situation for the *Graicunas* effect.

But the frequency of interaction is only half of the story. Reporting on progress or receiving inspiration or information from a superior are comparatively benign interactions, but the necessity of a decision following a meeting imposes a severe kind of coordination problem. The effects of this are not confined to span of management but are also influenced by the number of levels in the organization, for, as Fayol pointed out,¹⁷ as orders are passed through a series of intermediaries, the opportunities for distortions, omissions, or misrepresentations are increased.

Thus, adequate authority delegation¹⁸ provides a major offset to the frequency and severity of interaction between the superior and his direct subordinates and, hence, a major offset to the limitations on the size of the span of management.

When the authority for decisions is moved downward in the organizational hierarchy, the process is frequently termed decentralization. Decentralization can have the effect of reducing the necessity for, and hence the volume of, communications up and down the scalar chain.¹⁹ This in turn reduces the impact of the length of the total scalar chain on the flow of information. Authority delegation thus provides an offset to information flow problems caused by the number of levels in an organization—it puts the decision where the action is.

The "gangplank" principle. Fayol²⁰ refers to direct communications by subordinates, operating within their spheres of authority, as the use of a "gangplank." That is, a direct bridge may exist between two members of different departments, and communications may cross this bridge, or gangplank, even though authority follows the scalar chain. It is a sound principle of good management that there must be a clear line, or scalar chain, from the ultimate authority to every subordinate position in the organization. The existence of this chain of authority constitutes the formal organization and

provides a route over which information may, and does, pass. But it is not the only route possible or desirable for the flow of information. If an actuary would like to know how many claims have been filed this year on the "Programmers' Special" life policy, and he could determine this by directly contacting a records clerk in the claims department, there is no general reason why he should not do so. To fill out a special information request form, to pass this up the line until a common supervisor (perhaps the executive vice president in this case) is reached, and to wait for it to filter down through the scalar chain until it reaches the records clerk, and back through the same route with the clerk's answer would be an unnecessary waste of everyone's time.

Fayol suggests that the supreme executive insist that subordinates take advantage of the gangplank principle as long as the course of action is approved by the employee's immediate superior and that the personnel involved remain in agreement. The use of the gangplank avoids many of the communications problems created by the number of levels. It also reduces the frequency of interaction of superiors and subordinates at all levels, but not necessarily the severity of interaction, since decisions for which no authority has been delegated must still be processed along the scalar chain. However, it is often possible for several subordinates to produce enough authority among them to resolve problems without recourse to higher management.²¹ This combination of "splintered" authority, a logical extension of the gangplank principle, can be a very useful device in overcoming the limitations of span and depth of organization, but its recurring use on similar matters may indicate that authority delegations have not been properly made and that some reorganization is in order.

Objective standards at strategic points. Subordinate training, good planning, proper authority delegation, and advantageous use of the gangplank principle may reduce the need of the subordinate to communicate with his supervisor. However, it is still the responsibility of the supervisor to insure that proper control—or the conformance of events to plans—is being exercised. This managerial function of control promotes superior-subordinate interaction at the instigation of the manager.

The frequency and severity of interaction with subordinates can be markedly reduced for a man-

ager if he is able to establish simple, objective criteria at strategic points in the operation, against which actual results can be measured. Objective standards at strategic points form the cornerstone of the exception principle,²² which states that a manager should direct his attention only to significant deviations. The use of this principle not only reduces the necessity of direct superior-subordinate contact, but also by helping to define more precisely the information that is most required at various levels of the organization, makes the flow of information between levels more efficient; this is accomplished in both a positive and negative sense—by focusing on and acquiring what is needed and by eliminating that which is superfluous.

The staff device. The staff assistant or group may be a particularly useful device for keeping an executive informed on matters that require summarized, specialized knowledge or special studies that cannot be effectively delegated to operating personnel. The staff can collect and distill information on particular topics or subject areas, inside or outside of the organizations, on an ad hoc or continuing basis. To the extent that the staff deals exclusively with information and advice, it is independent of the length of the scalar chain and requires only the right of access; this independence establishes the staff device as an effective offset to inefficiencies created by a large number of levels of organization.

The staff device can also serve to broaden the permissible span of management. This is accomplished partly by providing the decision maker with research on the problem area to decrease the severity of the superior-subordinate interactions. But the staff may also decrease the frequency of interaction between manager and subordinates when it exercises a functional authority over specific kinds of activities.

Urwick²³ recalls an example of this in the organization of a British infantry division. The division commander in this instance had eighteen persons reporting directly to him, clearly a very wide span of management; yet he spent only a couple of hours a day in his office and was able to maintain a very close contact with all of his subordinates. But every subordinate was expected to take up all routine business in the first instance with the appropriate staff officer; only after the subordinate had failed to secure a satisfactory settlement with the staff officer would the commander accept a direct discussion.

The commander thus had only six immediate subordinates who **usually** approached him directly, plus two staff officers. The latter relieved the commander of all of the routine work of coordinating line and specialist activities and did virtually all of the paper work, drafting of orders, correspondence, etc. Yet, the staff officers had no personal authority; the responsibility for everything they did and every word that they wrote was the commander's.

Right versus use of direct access. A powerful device for preserving an executive's time, yet permitting a wide span of management and preventing a loss of morale by creating additional levels of organization, is for the executive to make a clear distinction between a subordinate's **right** of direct access to him and the frequent **use** of that right. In Urwick's example of the British infantry division commander, the subordinates' nominal right of direct access preserved a unity of command and safeguarded their independent responsibility for their functions as well as their organizational status. Also, a right of direct access to a high-level executive for the purpose of transmitting important information can substantially relieve the problem of communication through numerous levels. This principle is important, if delegation of authority and the use of the staff device are to work well.

Some companies make noteworthy use of the right of direct access by a well-published policy that every employee in the organization may deal directly with the chief executive, if the employee feels that there is a matter that merits this attention. One such firm is International Business Machines.²⁴ Although at IBM the "open door" policy is discussed primarily in terms of its value in promoting good human relations, the possibilities for communication on important matters that might otherwise escape the attention of management are clearly recognized.

Technological developments. Technological developments can affect the operations of a business in many ways. Simulation techniques and operations research methods can help the manager evaluate the many factors in a large and complex business. The discovery and implementation of principles of management provide guides to effective administration that help offset the problems inherent in large-scale operations. Developments in computer technology that permit a growing number of tasks to be automated will directly affect the way

that these tasks are departmentalized, as well as the technical aspects of the manager's job.

There are two ways in which technology will produce an effect on the scale of operations.

♦ There may be an augmentation of the impact of the previously mentioned seven offsets. Programmed learning techniques, for example, may make subordinate training more effective, or PERT methodology may upgrade the planning process for certain types of projects.

♦ Advances in information technology may directly relieve communications problems that now restrict growth. For example, current efforts in the development of management information systems are directed in part toward providing management with the ability to obtain detailed information on demand for many aspects of the business; such systems have, at least conceptually, the potential of eliminating most of the information flow problems arising from a large number of levels of organization.

An Intractable Problem?

It would be a digression to elaborate on such matters as the "state of the art" in management information systems, the effect of EDP on centralization or decentralization of authority, or the prospects of middle management in the automated enterprises of the future.²⁵ However, there is an important concluding remark pertinent to technological developments as an offset to the frequency and severity of superior-subordinate interactions, and problems of information flow through the levels of organization. The contribution of technology will, in the long run, be positive—that is, it will have the effect of permitting larger spans or greater numbers of levels—or the innovation would be discarded. This means that, if empirical studies based on current data validate the hypothesis that large-scale operations can be managed as efficiently as their smaller counterparts, then these conclusions should hold with increasing force for the management of the future.

How big is big? The obvious argument for the existence of eventual diseconomies of large size is that, conceptually at least, all of the offsets previously listed are themselves subject to

the law of diminishing returns. That is, the proportional advantages gained from a given offset cannot be expected to continue indefinitely, and each factor will eventually play itself out. This may be true. But the important question from the standpoint of management theory is not that raised by the special case of the infinitely large organization; rather, it is whether a firm can expand without incurring increased costs of coordination up to the limits fixed by the scarcity of other economic resources or by the extent of its markets. That is, it is sufficient to demonstrate that management is not the limiting factor.

It can readily be shown that very large organizations can be created using small spans of management and numbers of organizational levels. Figure 4 was constructed from a relationship that assumed that a given span of management was carried throughout the organization and that the total work force consisted of the maximum number of employees that was mathematically possible with a given span and number of levels. This diagram shows that the personnel of the world's largest life insurance company could be contained in an organization with a span of only 6 and a depth of 7, or a span of 4 and depth of 8, etc.²⁶ It has been estimated that there were 1,142,000 persons employed in the insurance business, including clerical workers and salesmen in life and nonlife fields, in the whole of the United States in 1962;²⁷ this number could be absorbed by an organization with a span of 6 and a depth of 8. On the basis of fifteen workers to a fore-

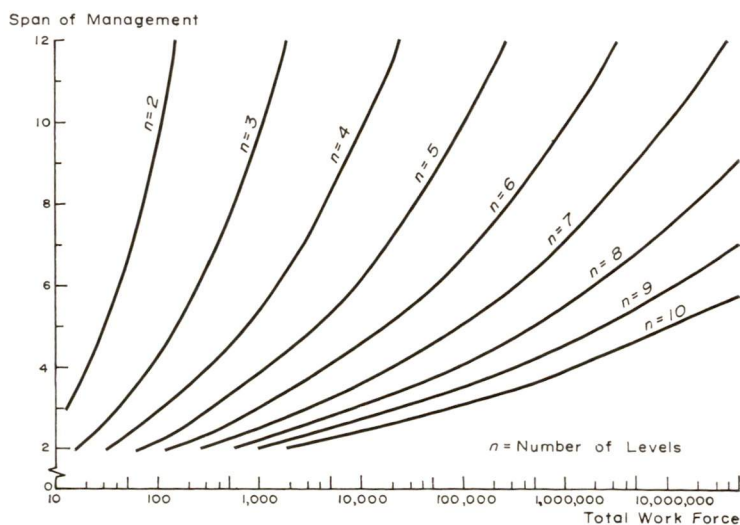


FIG. 4.—TOTAL WORK FORCE FOR VARIOUS SPANS AND LEVELS

man, and only four superiors to every supervisor, Fayol illustrated that 251,658,240 workers could be employed by a firm with a depth of only twelve levels—more than the entire population of the United States!

I quote these figures . . . to show that the normal form of development of the organization lends itself well to the grouping of any number of employees and that the number of levels of authority in the largest business concerns is quite small.²⁸

The importance of the above argument is that, for the sizes of organizations to be encountered in practice, the problem of coordination is not as intractable as has frequently been suggested. If the offsets available to the manager do eventually play themselves out, these diminishing returns must occur very quickly indeed if they are to restrict any actual operating managers. It appears that any increasing costs of coordination could be more appropriately attributed to poor management—the inability or unwillingness to make use of the offsets and principles of management that are available—than to organization size.

There is some empirical evidence to support this conclusion. Suojanen,²⁹ in an attempt to show that the span of management is no longer a valid principle,³⁰ cites the data presented in Table I. Representing firms “known to have good management practices,” these data were assumed by Suojanen to raise doubts about the validity of the Graicunas hypothesis, since “the theoretical limits of the executive span of control are in practice more often violated than they are observed.”³¹ But Table I could just as convincingly show that offsets to frequency and severity of interaction are indeed operative over the spans discussed.

Preliminary results from my research into the effects of organization size on the operating efficiency of life insurance companies also tend to contradict the hypothesis that large size imposes losses in efficiency. Figure 5 portrays the relationships between total administrative cost (measured as non-sales, i.e., clerical and managerial personnel plus office equipment costs) and size as measured by the total amount of life insurance in force. The total administrative costs are adjusted values, reflecting adjustments to eliminate cost variations attributable

TABLE I. NUMBER OF EXECUTIVES REPORTING TO PRESIDENT IN ONE HUNDRED LARGE COMPANIES (Over 5,000 Employees)

Number of Executives Reporting to President	Number of Companies	Total Theoretical Direct and Cross Relationships
1	6	1
2	—	6
3	1	18
4	3	44
5	7	100
6	9	222
7	11	490
8	8	1,080
	Median	
9	8	2,376
10	6	5,210
11	7	11,374
12	10	24,708
13	8	53,404
14	4	114,872
15	1	254,974
16	5	524,534
17	—	1,114,392
18	1	2,359,612
19	—	4,981,090
20	1	10,486,154
21	1	22,020,532
22	—	46,137,824
23	2	96,469,518
24	1	201,327,166

SOURCES: Columns (1) and (2) are from Ernest Dale, *Planning and Developing the Company Organization Structure*, AMA Research Report 20 (New York: American Management Association, 1952), p. 57; Column (3) is from Graicunas, *Relationship in Organization*, Bulletin, International Management Institute (Geneva: International Labor Office, 1933). (Relationships beyond 12 subordinates have been computed according to Graicunas' formulas.)

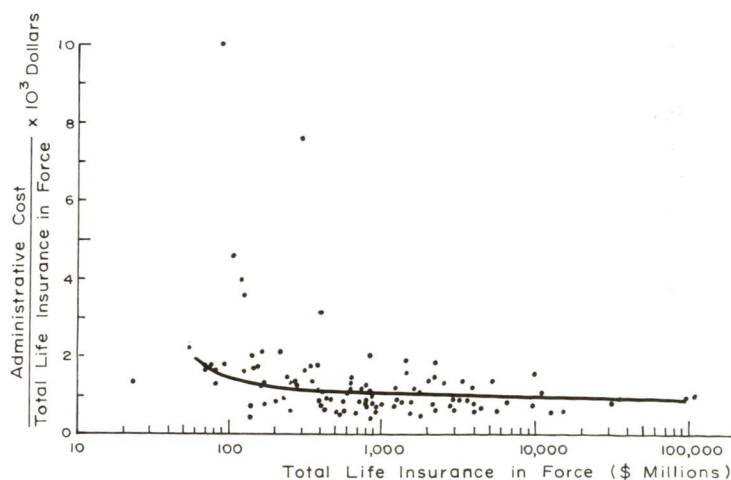


FIG. 5.—ADMINISTRATIVE COST RATE BY SIZE OF COMPANY

to different proportions of term and industrial business written by the companies in the sample. Figure 5 reveals some advantages of medium-sized and larger firms, but no noticeable diseconomies of large scale, and the range of size of the firms in this sample is five orders of magnitude!

Summary

Conclusions. There is conceptual justification for the hypothesis that increasing spans of management and/or number of organizational levels can result in a deterioration of management performance. However, there are factors that a manager can employ that provide offsets to the frequency and severity of interaction required between a manager and his subordinates, and to the restrictions in the flow of information between organizational levels. These offsets, when properly used, will permit a wide variation in the number of subordinates a manager can supervise and the number of levels an organization can tolerate without adversely affecting coordination. And since extremely large organizations can be constructed using relatively small spans and number of organizational levels, management theory imposes no a priori reasons why diseconomies of large size need necessarily occur in the largest organizations to be found in practice.

REFERENCES

1. For a general discussion of this and other points relating to organizational size and a review of the literature, see Theodore Caplan, "Organizational Size," *Administrative Science Quarterly*, I (March 1957), 484-505.
2. It has also been argued that: (a) since coordination must be the act of a single center, division of labor cannot apply to this task; (b) thus, supply of coordinating ability cannot be expanded with increase in the supply of other factors; (c) since the supreme coordinating authority must have knowledge of details of problems, expansion requires greater knowledge by the coordinator. For a discussion of these fallacies, see N. S. Ross, "Management and the Size of the Firm," *Review of Economic Studies*, XIX:3 (1952-1953), 148-154.
3. H. Koontz and C. O'Donnell, *Principles of Management* (3rd ed.; New York: McGraw-Hill Book Company, 1964), pp. 216 ff. Many of the concepts in this section were derived from this reference and applied specifically to the question of organization size.
4. George A. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Processing Information," *Psychological Review*, LXIII:2 (March 1956).
5. V. A. Graicunas, *Relationship in Organization*, Bulletin, International Management Institute (Geneva: International Labor Office, 1933). Also published in *Papers on the Science of Administration*, eds. L. Gulick and L. Urwick (New York: Columbia University Press, 1947).
6. L. Urwick, "The Manager's Span of Control," *Harvard Business Review*, XXXIV:3 (May 1956), 41. A number of writers, including Urwick, speak of "span of control" rather than "span of management." The latter term is used here because the limitations imposed by the principle apply not only to the managerial function of control, but also to other management functions.
7. Koontz and O'Donnell, *op. cit.*, p. 222.
8. "In an exhaustive theory of organization, communication would occupy a central place, because the structure, extensiveness, and scope of organization are almost entirely determined by communication techniques," Chester I. Barnard, *The Functions of the Executive* (Cambridge: Harvard University Press, 1958), p. 91. Also, "communication is the limiting factor in the size of simple organizations and therefore, a dominant factor in the structure of complex organizations," *ibid.*, p. 106.
9. Herbert A. Simon, *Administrative Behavior* (New York: The Macmillan Company, 1959), pp. 26-28.
10. There are, of course, other considerations than span of management or number of levels used in arriving at a desirable organization structure. See, for example, the principles of departmentation and assignment of activity, Koontz and O'Donnell, *op. cit.*, pp. 231-261.
11. For example, Rensis Likert, *New Patterns in Management* (New York: McGraw-Hill Book Company, 1961). See also William H. Newman, *Administrative Action* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965), pp. 262-263.
12. Simon, *op. cit.*, p. 28.
13. For a different treatment that arrives at substantially the same conclusions, i.e., that the marginal cost per worker remains below a definite bound no matter how large the organization, see Martin J. Beckman, "Some Aspects of Returns to Scale in Business Administration," *Quarterly Journal of Economics*, LXXIV (1960), 464-471.
14. See, for example, Koontz and O'Donnell, *op. cit.*, p. 222.
15. Simon, *op. cit.*, p. 15.
16. Koontz and O'Donnell, *op. cit.*, p. 223.
17. Henri Fayol, *General and Industrial Management* (London: Pitman & Sons, 1963).

18. For a list of principles that serve as guides to effective authority delegation, see Koontz and O'Donnell, *op. cit.*, pp. 63-66.

19. For a discussion of some of the advantages and disadvantages of decentralization, see K. K. White, *Understanding the Company Organization Chart*, AMA Research Study 56 (New York: American Management Association, 1963), pp. 44-49.

20. Fayol, *op. cit.*, pp. 34-46.

21. W. Waino Suojanen refers to the formation of "primary groups" through which the supreme coordinating authority "becomes indefinitely extensible with no limit to the size of any one formal organization," not only invalidating span of management limitations, but unity of command as well ("The Span of Control—Fact or Fable?" *Advanced Management*, XX:11 [Nov. 1955], 11). This is an extreme position.

22. First formally stated by Taylor (see *Shop Management* [New York: Harper and Brothers, 1919], pp. 126-217) and frequently mentioned in management literature.

23. Urwick, *op. cit.*, p. 46.

24. Thomas J. Watson, Jr., *A Business and Its Beliefs* (New York: McGraw-Hill Book Company, 1963), pp. 19-21.

25. See, for examples: Koontz, "Top Management Takes a Second Look at EDP," *Harvard Business Review*, Nov.-Dec. 1961, pp. 74-84; J. F. Burlingame, "Information Technology and Decentralization," *ibid.*, pp. 121-126; Charles Stein, "Some Organizational Effects of Integrated Management Information Systems," *Changing Dimensions in Office Management*, AMA Report No. 41 (1959), pp. 82-89; Norman J. Ream, "Organizational Relationships of Operations Research, Systems Planning, and Data Processing," *ibid.*, pp. 90-102.

26. The actual maximum executive span of this company was 8, and depth about 6, as of June 1963.

27. Virginia T. Holran, "Employment in the Insurance Business, 1962" *Journal of the American Society of Chartered Life Underwriters*, XVII:2, p. 158.

28. Fayol, *op. cit.*, p. 55.

29. Suojanen, *op. cit.*, p. 6.

30. For a point-by-point rebuttal to Suojanen's contention, see Urwick, "The Span of Control—Some Facts About the Fables," *Advanced Management*, XXI (Nov. 1956), 5-15.

31. Suojanen, *op. cit.*, p. 6.



E. 701

Exam

3-11-64

1. What is the fallacy of arrogation? Give 2 examples.

2. Analyze the effects of a min. wage law.

a. ~~With~~ Under competitive conditions

b. Under monopoly control of supply of labor

c. Under monopsony " " demand for labor.

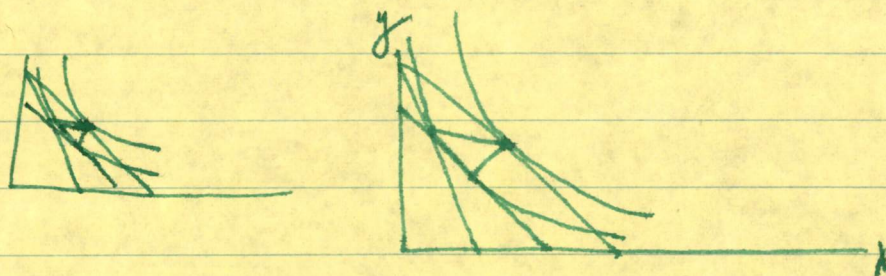
3. Why are indifference curves usually convex to the origin?

4. Two choices:

a. Explain the Edgeworth Box Diagram

b. Explain the distinction of income effect & substn. effect of a price change, using indiff. curves.

(In class, show 2 ways to express excess burden.)



5. What is the ec. limit on the desirability of spreading overhead over time?

Qn. Where e . of prodn. of ~~raw~~ labor = 1, what is
 e . of prodn. of land?

(Note implies: sum of e 's = 1, const. retr. to scale.)

Lawyer Raps Courts for Stifling Creativity

Technological creativity is being stifled by government and industry, a patent attorney and Massachusetts Institute of Technology lecturer said here Wednesday.

"If someone calculated a way to stifle creativity, he couldn't do better than our mode of living today," said Robert H. Rines, Boston. Rines is also president of the Academy of Applied Sciences. He spoke at a seminar on research by small firms at the Milwaukee School of Engineering, which sponsored the seminar with Research Development magazine.

Rines attacked federal judges as political appointees without sufficient knowledge to decide the technical industrial questions that come before them.

Rines related one case in which an independent inventor created an electric motor that was a great improvement and decidedly different than any previously developed. He patented it and offered to license a large manufacturer to make the motor.

Inventor Filed Suit

The company had the inventor explain the new motor to its engineers but decided that it was not interested. Later the company put a new motor, incorporating the inventor's technology, onto the market.

The inventor sued but the federal district judge said he could not understand the technical improvements involved and therefore couldn't rule that the company had stolen the patent. The appeals court said the same thing but the inventor died before the appeals court made up its mind.

Rines said a study made by students at MIT found that while 80% of the patents filed were by big companies, about one-third of these were actually on inventions bought from small business or independent inventors.

Many companies, Rines said, while claiming they want creative people, actually force employees into conformity.

Supervisors Unaware

The MIT study found that 80% of the engineers interviewed said they had ideas for new products but had not told anyone about them, Rines said, for these reasons: They felt no one would pay attention to their idea; past ideas had been adopted but the engineers had gotten no recognition; they felt it was too much trouble to "fight city hall."

The study also found, Rines said, that most supervisors had

little or no idea about what their engineers thought about the projects they were working on.

Rines also called on the businessmen at the seminar to enter politics and take an active part in making the governmental decisions that require a knowledge of business and technology.

Another speaker, Paul J. Grogan, director of the federal office of state technical services, described the office's efforts in disseminating and compiling information for business.

Treasure Island Store Expanding

Appleton, Wis. — J. C. Penney Co. announced that an expansion of its Treasure Island store here would begin soon.

Construction of a one story addition and an automotive department will give the store a total area of nearly 160,000 square feet, more than double the present size.

The new automotive department will provide space for car servicing and sale of tires, batteries, accessories, gasoline and oil.

Included in the expansion are a 28,000 square foot center for home furnishings and appliances and an outdoor garden shop. All existing departments will be enlarged.

Coal & Dock Firm Appoints Executive

Allan D. Thomson has been named executive vice-president of Great Lakes Coal & Dock Co. here. Thomson, who joined the company two years ago, had been vice-president.

Exchange Picks Aide

New York, N. Y. — Bernard Landou, a former director of motion pictures and television for Barkin, Herman & Associates, Milwaukee public relations firm, has been appointed manager for radio-television services of the New York Stock Exchange.

Dutch Lower Rate

Amsterdam, Netherlands — UPI — The Dutch state bank lowered its official bank rate from 5 to 4.5% Wednesday.

PRIVATE OFFICE SPACE AVAILABLE

In newly remodeled building downtown. Includes telephone answering service. For Appointment:

312 E. Wisconsin Room 620
271-2434

Quik Lith Printing INSTANT SERVICE

FAST, LOW COST REPRODUCTION ONE HOUR SERVICE

If Brought In and Picked Up

Form letters, records, drawings, parts and price lists, catalog sheets, office and factory forms, etc.

8 1/2 x 11 — 20 Lb. White Bond Paper
100 COPIES \$2.95 250 \$4.45 500 \$6.95 1,000 \$9.95

COMPLETE PRINTING SERVICE

500 Business Cards \$5.25
1,000 Business Cards \$6.75
1,000 No. 6 1/4 Envelopes \$7.95
1,000 No. 6 1/4 Look-In Env. \$8.95
1,000 No. 10 Envelopes \$8.95
1,000 Statements \$9.45
1,000 Letterheads \$9.95
1,000 Shipping Labels \$8.45

Save money on all your printing needs. Let us give you a QUOTE. We welcome mail orders. Write for free price list.

LEO LIEBERMAN, INC.

2601 N. 3rd St. Phone 372-8787
(1 Block South of Center St.)
(Please Keep This Ad for Reference)

MANAGEMENT TRAINEES

 **Big Boy**

FAMILY RESTAURANTS NO EXPERIENCE NEEDED

If you are 25 to 35 and have nice appearance, good character and work attitude, we will train you to ADVANCE QUICKLY.

TRAINING SALARIES \$500 to \$600 per month while learning cooking and basic management. In 5 to 9 months you will progress to \$8,000 to \$10,000 management position. No limitation on your growth in our expanding 3 state company.

Company provides PAID VACATION FREE LIFE INSURANCE, MAJOR MEDICAL and HOSPITALIZATION plan and a FAST MATURING PENSION PLAN.

IF YOU CANNOT SEE A FUTURE IN YOUR PRESENT POSITION, look into our program by calling for personal interview:

JAMES SCHAAF 342-6464
DAVE BURKHART 273-5700
(Plankinton BIG BOY)
TOM WRIGHT 464-6560
(Capitol BIG BOY)
VINCE KUBIAK 482-4550
(Layton BIG BOY)

Special Report

THE M

G-E-X HAS EV

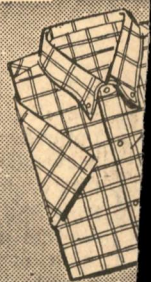
exclusively



Boys' Perma

Snowy white dress
sleeves, perma-
Polyester/cotton
Sizes 6 to 18...

BOYS' WE



Boys' C

Perma press
of Dacron®
host of plaid
solids. Sizes

BOYS'

R
of a
Men's A

Nov
MEN

Dissec. of Scale Poor Management Causes Dishonesty, Consultant Says

If a company has employees, the management may have only itself to blame, according to Norman Jaspan, President of Norman Jaspan Associates, Inc., a management consulting firm headquartered in New York, N. Y.

"Dishonesty is a byproduct of poor management," Jaspan said in an interview here Thursday. He spoke Thursday night at a meeting of the Employers' Association of Milwaukee.

Employers, he said, must assume the responsibility for their employees' morals. "People can be as honest as you want to keep them honest," he said.

Loyalty Lacking

Jaspan said there is a lack of company loyalty today.

"People don't work for Gimbels-Schusters or Schlitz today, they work for a supervisor," he said. "If I were on my first job, I'd be as good or bad as my supervisor," he said.

Unrealistic goals are another cause of dishonesty, he said. "If a man is required to achieve a goal while denied

the means of attaining it, he frequently feels forced to cheat in order to make his position secure," Jaspan said.

The vast size of companies today has resulted in top managers being the last to know of dishonesty, he said.

Backlog Created

Jaspan said one of the most glaring examples of this was a case in which 14 key management people in a company handed out subcontracting work on a deliberately created backlog of business for eight years.

He said these men had received kickbacks from the subcontractors, issued the contracts to firms in which they held an interest, or created dummy corporations in their wives' names.

None of these men had less than 25 years' seniority, and they stole \$4 million from the company, he said.

Jaspan said the real tragedy of this situation was that the company lost the heart of its key people.

Evidence Chronicled

Jaspan referred frequently to a stack of blue folders in which are chronicled a wide variety of evidences of employee dishonesty resulting in losses to their companies of from \$50,000 to \$5 million.

"Do you know we've had a case where people have run a computer backward to erase

\$250,000 worth of billing so they wouldn't have to work?" he said.

Jaspan's consulting firm and its fact finding division, Investigations, Inc., have compiled statistics from clients which include more than 100 companies listed on the New York Stock Exchange. He said his company also serves about one out of every three major retailers.

Jaspan also said that:

There is a better than 50% chance of sizable dishonesty in any firm, and a 75% chance of harmful malpractice.

More than 25% of the profits on sales made by the nation's retailers go down the drain because of internal dishonesty.

Manufacturing firms are experiencing losses equally costly and even more dangerous because these losses are concealed by their methods of cost accounting.

Known bank embezzlements are up nearly 60% over the last two years.

Jaspan said that employee dishonesty and indifference will have a greater influence on profits than inflation this year.

Bank Elects 2 Officers

Madison, Wis. - John F. Mack and William A. Schroeder, both Milwaukee natives, Co. Mack will be assistant vice-president and Schroeder an assistant trust officer.

vision—

\$565⁰⁰

Magnavox 295 Sq. In. Color Television—
Mediterranean pecan. SAVE \$55.....

\$595⁰⁰



\$298⁵⁰

Magnavox Color TV Stereo Theatre—295
sq. in. picture, walnut cabinet. SAVE \$50.....



\$745⁰⁰

Magnavox
Contempo

**WE CUT PRICES ON EVERY MAYTAG WASHER AND DRYER
HURRY TO BUY BEFORE MAYTAG PRICES GO UP!**



*See These D
Features*

Out
B_{put}



Input

Mon., 3-11-68

2. Labor, wages. a Rent?

Argument re inc. effect, & backward-bending curve.

Is argument of old straw-boss; also modern statist, &c.

Weaknesses:

a. Throws out all macro ecs. Makes unemployment voluntary. Implies that Δ demand will reduce employment. Sticky wage rates imply elastic supply of labor.

b. Overlooks redistribn. effects. Higher wages mean lower prop. inc., hence no net inc. effect.

Or higher taxes mean higher govt. benefits.

Can see thru to basic points so: If taxes hit incl. effort, & benefits come w/o effort, reduces work. If taxes are fixed, & benefits go as incentives (e.g. bonuses for work, or depletion) then get more effort.

c. Incl. ^{substn.} effects are immediate & relevant; inc. effects are long term, nebulous, & do not belong in supply curve.

d. Historical proof of shorter hours is doubtful, & irrelevant. Ceteris paribus. If we put a higher price on leisure today, it is not just because of higher wage rates.

e. Migration always possible -- ~~not~~ while land can't.

f. No incl. supply of zero value.

3. Capital.

Interest a rent, too? Enthusiasm of rentiers?

Overcommitment, hi rates, shortage in view.

a. Higher int. lowers durable values. Solo article

b. Higher i . makes capl. immigrate

c. " " " " " " turn faster



d. " " " " avoids capl. consumption. Consider a zero i . Live by borrowing indefinitely.

Consider an annuity you can get from a fixed endowment. How much % can you add by consuming capl?
Depends on i .

$$c = \frac{i}{1 - \frac{1}{(1+i)^L}}$$

4. Variability of factor prices. Limits to substn.

If you're 90% labor, then a small drop in wage rate makes a big Δ of return to property.

So if become capl.-intensive, become very sensitive to higher i .

Meaning of capl.-intensive. Under vertical intr.
If one cycle of prodn. is long, then capl: output is high.

And i will rise, as soak up capl.

Tax shifting -

Ex. 701

✓ Re shifting, supply of capital may be reduced by slower turnover as well as outright destruction or export.

Means of removing capital from tax base: (depending in part on the tax):

1. Non-creation
2. Consumption, ~~non-replacement~~
3. Emigration
4. Conversion to untaxed forms.
5. Change of durability
 - a. To avoid prop. tax, make less durable.
 - b. " " inc. " " more " "

Mon, 5-4-64

(Rob. Wage-grumbles)

Shd. wages rise w. productivity?

Lieb. defines wage, p. 334, as cost to employer. How about taxes?

Back-bending supply curve?

Possibilities of Δg output by $-\Delta$ wage. Depends on factor propns. If product lasts one year, labor is $\frac{100}{105}$ or 95%, can Δ return to capl. 20% by reducing wage 1%. Big Δ invest. Capl. moves into farms comply. to labor.

W. hi wages, invest. moves into durables where it doesn't matter.

E.g. timber. $i = \left(\frac{G+V}{C+V} \right)^{\frac{1}{t}} - 1$. Employ labor less often.

So demand for labor is very elastic.

Argument is that lower wage rate means lower wage bill.

But what of c.b. effect, Δ value of M ?

What is needed to permit of hi wages? Many complements, few subs.

a. Abundant land & nat. res.

b. Access to & dev't of same

c. Hi turnover of capl.; and/or large continual additions to capl. by import or net creation

Calls for hi i . Only way to keep that plus hi wages is by abundant access to res.

(Continual capl. import not impossible — just treat

it well)

d. Compu. among employers - & sellers, but real wages also important.

Assign: Rdgs Thy Inc. Distr.

Wicksell, Value --, II.

Lutz, I, 172-18

133-44

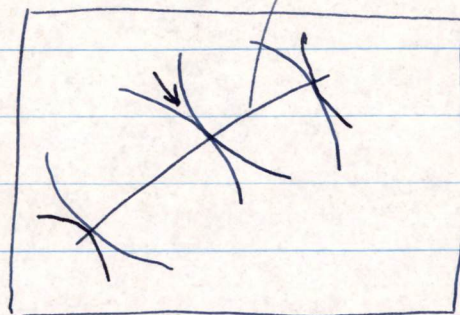
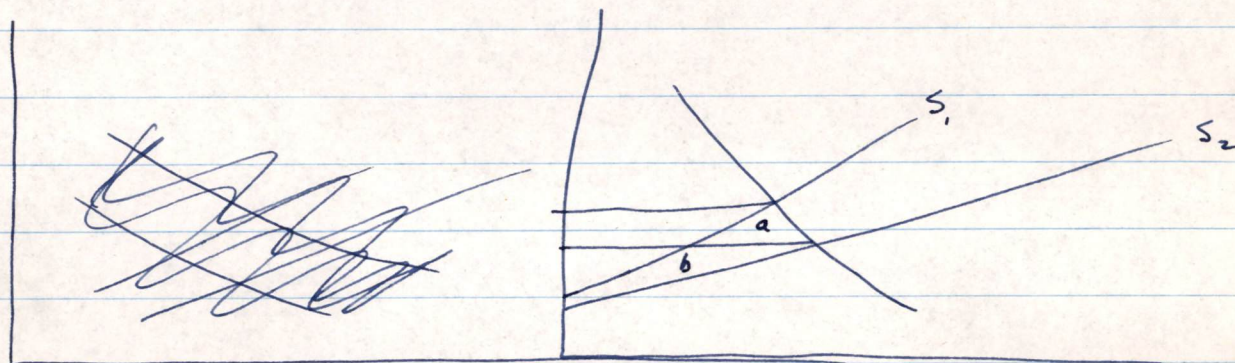
Gaffney. 22-28

Supply of labor

As my wage rises I do have more to spend. But before I spend it on leisure, I spend it on hiring others to relieve me of lesser work so I can specialize in greater work

Price

Box diagram



Easiest way to explain "b" is as new producers surplus.

Notes used by Ben Ho Koo for lecture in economic theory,
Ec. 701, on "Golden Triangle",

§ Application of the "surplus approach" to trade controls

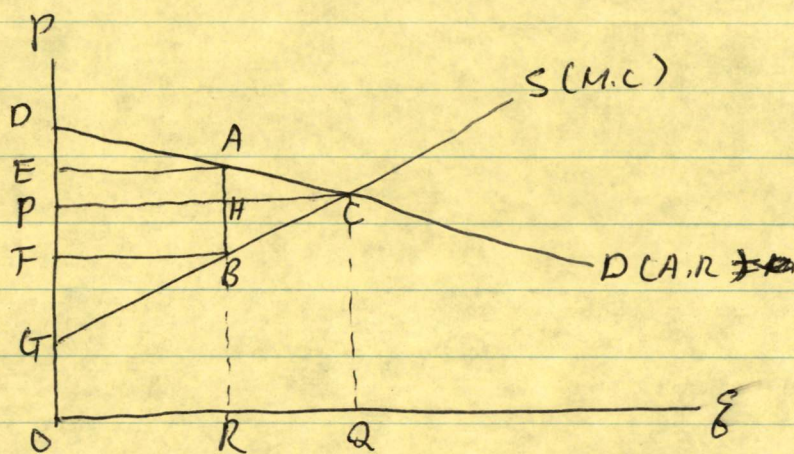
A. General

1. Basic concepts

consumers surplus : ΣMU - total amt paid by consumers

producers " : $T.R - \Sigma MC$

gov't revenue or cost



2 Effects of unit output tax (say EF)

Before tax

consumers surplus : CDP

producers " : CGP

gov't revenue : none

after tax

consumers loss : $EACP$

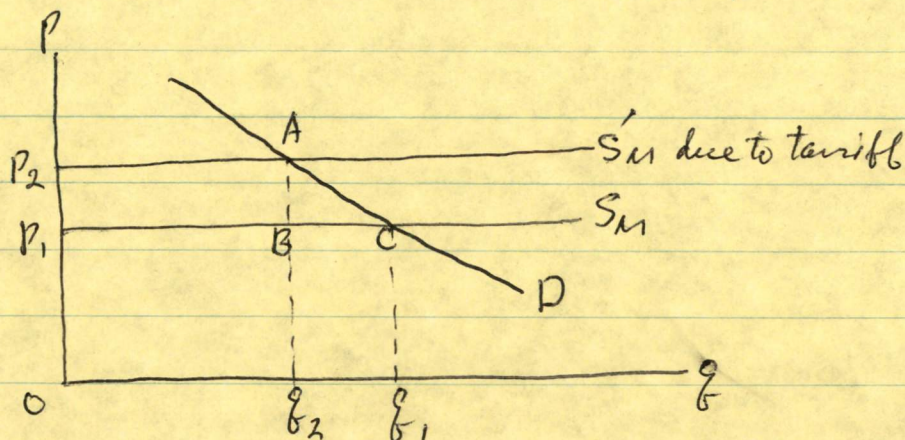
producers loss : $FBCP$

gov't revenue : $ABFE$

Net loss ("effect") of the tax : ABC ("Golden triangle")
from the welfare viewpoint
on the whole.

B. Welfare and trade controls

Case 1. No home production & perfectly elastic S of M.



1. Effect of Tariff ($P_1, P_2 = M$ duty)

consumers loss : ACP_1P_2

gov't revenue : ABP_1P_2

Net loss of welfare : ABC "golden triangle" gain

2. Effect of M quota (M quota = OQ_2)

consumers loss : ACP_1P_2

Any gain?

Windfall profit of ABP_1P_2 would usually shared by domestic importers, foreign importers, and gov'tal officials (bribe)

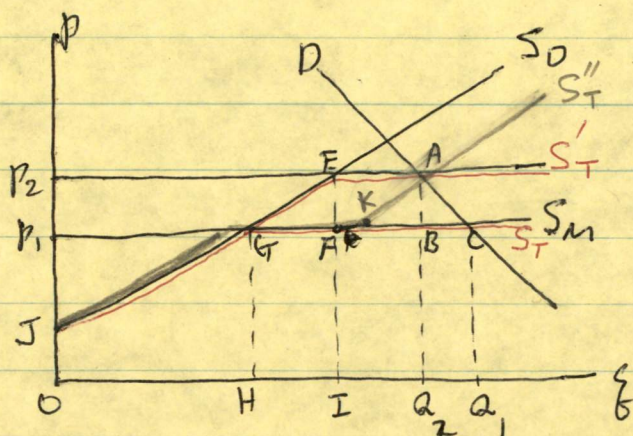
Ideally and theoretically, ABP_1P_2 can be collected by gov't by issuing license fees in the form of auctioning

Net effect from nat'l viewpoint

- 3) usually net loss : betw ABC & P_1P_2AC
- 1) at best : net loss of ABC
(gov't sale of license fee by auctioning or all importers are native)
- 2) at worst : net loss of P_1P_2AC
(importers are all foreigners)

Case 2 Some home production & perfectly elastic S of M

1. Effect of Tariff ($M \text{ duty} = P_1 P_2$)



S_D : home prod. S.

S_M : supply of M

S_T : $S_D + S_M$ before duty

S'_T : $S_D + S_M$ after "

S''_T : $S_D + S_M$ after M quota

M reduced from HQ_1 to IQ_2

S_D increased from OH to OI

Welfare effect

consumers loss : $P_1 P_2 A C$

domestic producers gain : $P_1 P_2 E G$

gov't revenue : $A B E F$

Net loss : $A B C$ and $E F G$ "Golden triangles"

2 Effect of M quota ($M \text{ quota} = I Q_2$)

$G K = I Q_2$

S''_T (total supply curve after M quota of $I Q_2$)

: $J G K A S''_T$

Welfare effect :

consumers loss : $P_1 P_2 A C$ (same)

dom. producers gain : $P_1 P_2 E G$ (same)

gov't revenue ? ?

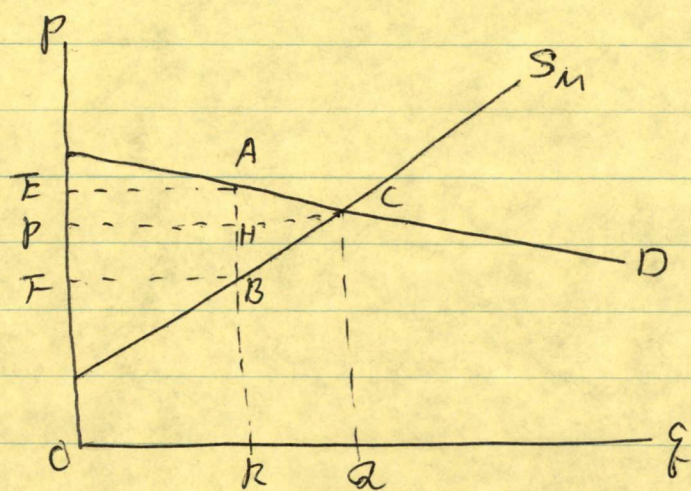
Net loss of welfare : at best ; $A B C$ and $E F G$

from nat'l viewpoint (if all importers are native or gov't license auctioning)

at worst : $G E A C$ (all foreign importers)

Taught this far

Case 3 No home production & a finitely elastic S of M



1. Effect of Tariff (M duty = EF)

domestic price : OE

suppliers (world) p : OF The difference of $p = M$ duty

Welfare effect

1) ^{from} national viewpoint :

consumers loss : $EACP$

gov't revenue : $EABF$

no domestic producers : 0

2) from world viewpoint

$EACP$

$EABF$

$PCBF$

Net effect : depends on $EACP \gtrless EABF$ net loss : ABC

* How do we know $EACP \gtrless EABF$?

Other things being equal,

If S_M is inelastic, more likely

$EABF > EACP$

* Meaning of inelastic S_M

the country is such a big buyer of that commodity that her amt bought would affect the price very much.

* From nat'l viewpoint, she can be better off

by imposing tariff provided that

- 1) S_M is inelastic (a large buyer)
- 2) no foreign retaliation

2. Effect of M quota ($M_{quota} = OR$)

1) from ~~the~~ world viewpt : same as in 1
i.e. net loss of ABC

2) from nat'l viewpoint

the same consumer's loss of EACP

∴ domestic producers loss : zero

gov't revenue & windfall profit : ?

Net effect

at best $\text{net gain (or loss)} = \overset{\text{loss}}{AHC} - \overset{\text{revenue}}{FPHB}$

if either all importers are native
or gov't revenue = FEAB by
auctioning licence fees

at worst EACP of net loss

if importers are all foreigners

usually : somewhere between

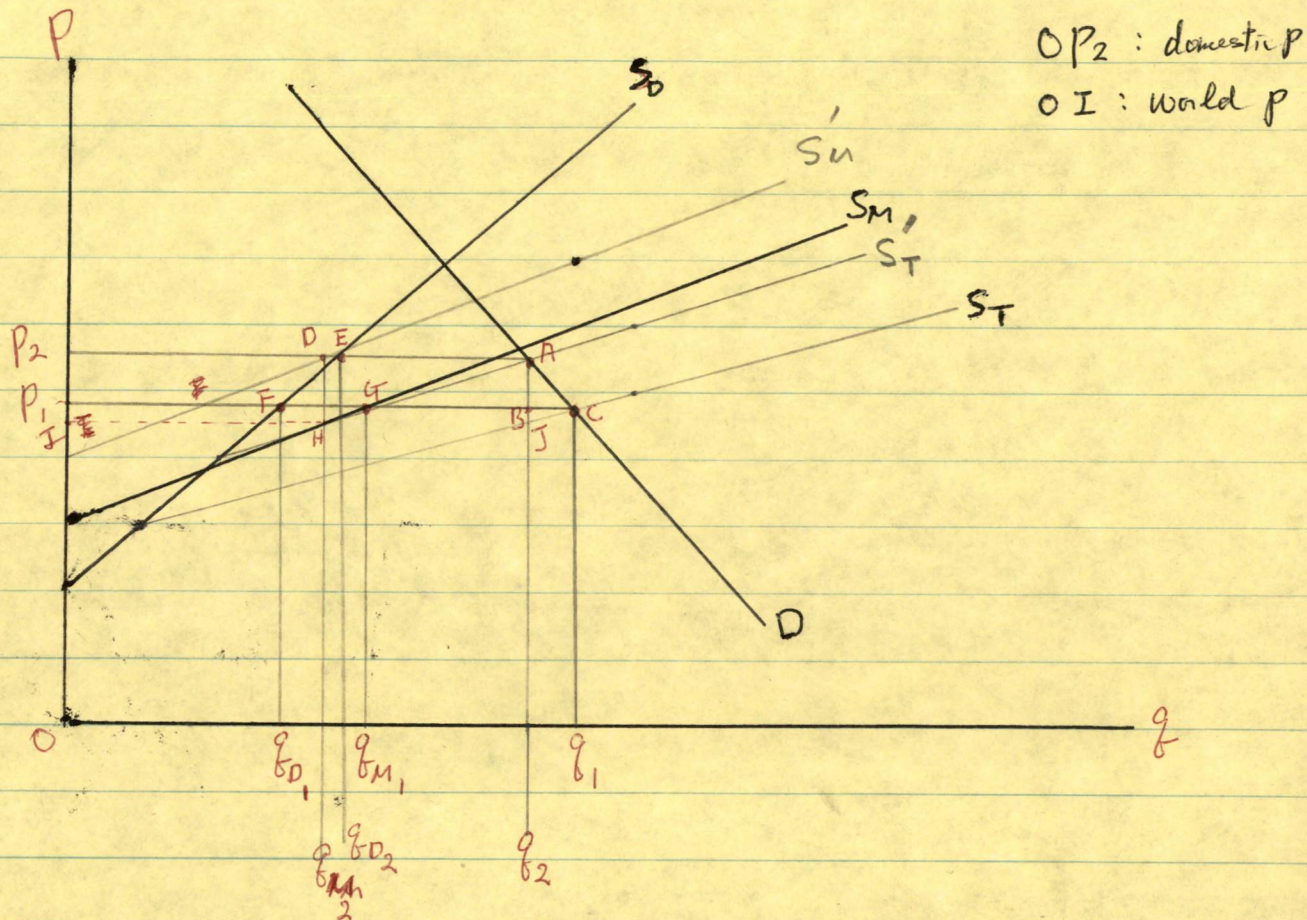
Case⁴ Some home production & a finitely elastic S. of M .

9 have done a self-exercise

The diagram ~~is~~ becomes very complicated

1. Effect of Tariff ($Mduty = IP_2$)

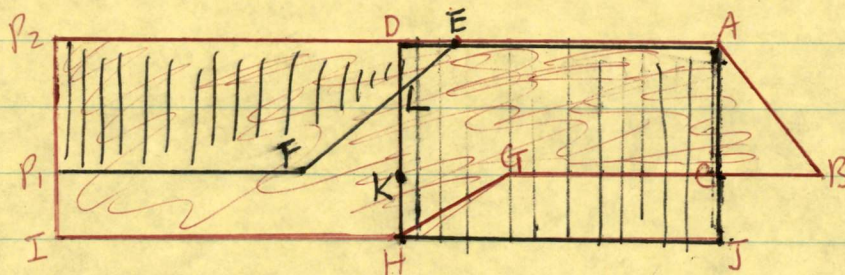
after tariff



OP_2 : domestic P
 OI : world P

1) From the world viewpoint

consumers loss $P_1 P_2 AC$
foreign producers loss $P_1 GHI$
domestic .. gain $P_1 P_2 EF$
gov't revenue $P_2 IHD = HDAJ$



Net loss : ABC and GHI and $(FKL - DEL)$

2) From nat'l viewpoint

depends on $HJCK + DEL \geq ABC + FKL$
(net gain) (net loss)

Key question is ϵ of S_M & ϵ of S_D

2. Effect of M quota ($M \text{ quota} = 0 \text{ } \& M_2 = \& M_2 \& z$)

Similar studies & method

Similar results & comparisons

Summary

1. If S_M is perfectly elastic,

(i.e. the country is a atomistic buyer of the commodity in the world market ("a small buyer")

then, from both $\times$ world $\times$ viewpoints
national

always net loss of welfare

2. If S_M is finitely elastic

(i.e. the country is "a big buyer" so that she can influence the price),

then she may increase ~~the~~ her ^{national} welfare by imposing tariff, especially

1) if S_M is very inelastic

2) if foreign countries do not retaliate
but from world $\times$ viewp't, always loss.

3. Usually tariff is a better method of trade control than M quota

When mwp restricts output, what happens to the resources it doesn't use?

They wd. go into compe., if it simply released all resources. So it must hold some of them idle, and they must be key limitational inputs; and their holding cost must be low.

That means land, very often.

Social policy, to break mwp, need only Δ cost of holding land.

4-1-68

Idealized requirements of perf. comp.
↳ Actual problems of inter. structure