Macroeconomic

Prepared by

Prof.Dr. Gamal I. Hassan

Chapter One

Chapter One

National Income and Production

This chapter is important. and must be approached carefully. There is a single basic idea hedged about by complications. The basic idea is simple. Each complication–if taken separately– is fairly easily mastered. The review questions following work accordingly: they start with the basic idea, then tackler the complications one by one. (Of painful necessity, this makes for an unusually lengthy sequence of such question.)

The basic idea is that of the national product: the measure of a nation's total output for a given period (1 year, usually).

Every nation uses its limited stock of labor power, machines, and materials to produce commodities and services. The money value of the resulting total output, each item valued at the market price for which it sold or would sell, is the national product for that period, (Never mind about all the difficulties which this computation involves. Your task here is to grasp the idea, not to do the counting.)

1- suppose, for example, that the national output consists of two commodities only: X, a consumer good, and Y, a capital good (some

form of machine or tool needed in production). In 1980, just 500 units of X were produced and sold to consumers at a price of $2. Twenty units of Y were produced and sold to business firms, at price $10. Then the national product for 1980 would be $(500 /800/1.000/1.200/1.500/2.000).

2-correctly speaking. this figure is gross national product, to produce this total output, the nation's existing stock of capital goods must have been to some extent used up or worn out during the year- that is, depreciated. Suppose the nation began the years with a stock of 100 Y machines (assuming, for simplicity that there is just this one kind of capital good involved). By the year's end, some few of these machines, the oldest, will have become completely worn out. And all the others will have moved just a little closer to the scrap heap.

Suppose the best-possible estimate of this 1980 depreciation (still using the question 1 example) is $50. (Appendix that depreciation must be an estimate; sometimes the best of estimates is not much better than a rough guess. There is no cash expenditure by the producing firm in question in a depreciation figure; it is just an estimate of the extent of

wearing out during the year.) The price of a new Y machine being $10. it is as though, to produce the 1980 national product, 5 Y machines, brand new at the year's beginning, had been completely worn out by the year's end.

The 1980 national-product figure of $1.200 included the value of the 20 new Y machines produced. But to make these machines, and to make also the 500 units of consumer good X. the equivalent of 5 new Y machines was totally used up. So the nation was not "better off" at the year's end by 20 machines - only by (5/10/15) machines.

With gross meaning "no allowance for depreciation," and net meaning" after allowance for depreciation. " then this nation's gross national product (GNP) for 1980 was $1.200. and its net national product (NNP) was $(1.000/1.050/1.100/1.150/1.200).

In the statistics for national product and national income, the phrase capital consumption allowances may be used instead of the word "depreciation."

To review:

Gross national product (GNP) is a measure of the total output of goods and services produced in a given time period, usually 1 year. all valued at their market prices, without any allowance for depreciation.

Net national product (NNP) is GNP minus a suitable allowance for depreciation (capital consumption.)

3- There are certain conventional divisions of GNP and NNP figures. Most basic of these is the division between (a) what was not only produced but actually consumed during the year in question, and (b) what was produced nation produced during the year, not as good for immediate consumption, but as an addition to the stock of capital goods.

This is the division between consumption goods (X goods, in the question 1 example) and investment goods (Y goods).

The consumption-goods total is the same figure in both GNP and NNP. The investment-goods figure in GNP is gross investment: total production of new capital goods without depreciation allowance. The investment figure in NNP is net investment: value of new capital goods produced after a deduction for depreciation. In the example above, the GNP of $1.200 would divide between consumption of

$(200/800/1.000/1.150/1.200) and gross investment of $(zero/100/150/200/250/300). The NNP of $1.150 would divide between consumption of $(200/800/1.000/1.150/1.200) and net investment of $(zero/100/150/200/250/300).

There are one or two other important divisions of the GNP and NNP totals. In particular, we soon must recognize that both include also a "government purchase" figure (the same figure in both). Such matters can be set aside just long enough to gain a little more overall perspective on national-product and national-income measures.

Like all developed nations, the United States relies overwhelmingly on the price-and- market mechanism. The commodities and services produced normally reach consumers by being sold for a market price. Indeed, that is what makes possible single dollar-value totals for GNP and NNP. (In any less developed "subsistence economy," where much of total output does not go through the pricing mechanism, money figures for GNP and NNP are of uncertain value.)

There are two notable exceptions to this rule of price and market handling of the national product:

1- Social goods are produced through the agency of government. (There are the government purchases mentioned above.) They are not sold on the marketplace; instead people pay for them through taxation.

2- A housewife supplies her family members with goods and services of great value. But ordinarily, even on her more difficult days, she does not think of charging a market price for each service that she furnishes.

It is best to begin by setting aside these and other such exceptions, thinking of a society in which every good and service supplied is given a money price, and supplied through the medium of that price.

The price of any such item is the exact amount available for dividing up among all those who helped to produce and sell it. Because incomes are earned by marking some contribution to production. the total value of what is produced ought to be the total value of national income.

Hence:

To a first approximation, net national product is also national income. The two figures are opposite sides of the same coin.

We must say to a first approximation, because a particular kind of government taxation causes the national-product and national-income totals to differ slightly. But we have been setting aside the complications produced by government. And with such complications removed, NNP will equal national income (NI).

This idea needs fuller development. There are just five earning categories within NI:

(1) Wages and salaries-by far the biggest item.

(2) Interest paid by business. (Anyone who has helped to finance a producing firm by lending it money is considered as having contributed to production. The amount of interest paid by the producing firm to the lender is the amount of income earned by that lender.)

(3) Rental income-received by supplying land or other property to producing firms. The principle here is the same as with interest payments.

(4) profit remaining after paying wages and salaries, interest. and rents. consisting of:

(a) Corporation profits (belonging to corporation shareholders).

(b) profits from unincorporated businesses- what the statisticians all proprietors' income.

GNP and NNP can be considered (with government still momentarily left aside) the total output produced and supplied by business firms- business firm here meaning anything from a huge corporation to a single individual with a tiny business. The business accounting form which records a firm's output and sales for any given period is its incomes statement. The income statement reports also its payments in wages and salaries, interest, and so on. So it is helpful to examine the relation between GNP, NNP. and NI in income statement terms.

4- a. A firm's income statement begins with the value of its sales for a given period- say, year 1980, sales amount $800. All costs incurred in making and selling these goods are then listed deprecation, wages and salaries, interest paid, rents paid. Suppose depreciation to be $25, and the total of the other three

items $650, What's left after deducting all such costs from the sales total profit- in this instance. $(zero / 25/ 50/ 75/ 100/ 125/ 150).

(You are not supposed to notice, that this income statement omits mention of raw materials bought as an operating cost[1]. This is deliberate: value added will be discussed a few questions farther along. For the moment, assume that our firm buys nothing from any other firm. It handles the entire production process, start to finish, by itself.)

The initial sales figure of $800 was this firm's contribution to GNP. Deduct depreciation, and its NNP contribution is $(700/725/750/775). The NI figure is the total of wages and salaries; interest paid, and profits remaining. So the NI figure here in $(700/725/750/775). Hence NI is (less than /equal to greater than) NNP.

b- Notice that profit is the residual item which makes things comes out even. Had our firm paid out wages, interest, and rents totaling $775, its profit (allowing for depreciation) would have been $(zero /25/50/75/100). NI would (still/ no longer) be $775. That is , NI would (still/ no longer) equal NNP.

[1] Also omitted: the "beginning and closing inventory" adjustments. They too will be picked up later. Nor is there any mention of taxes, since we have not yet brought government items into the picture.

A

B

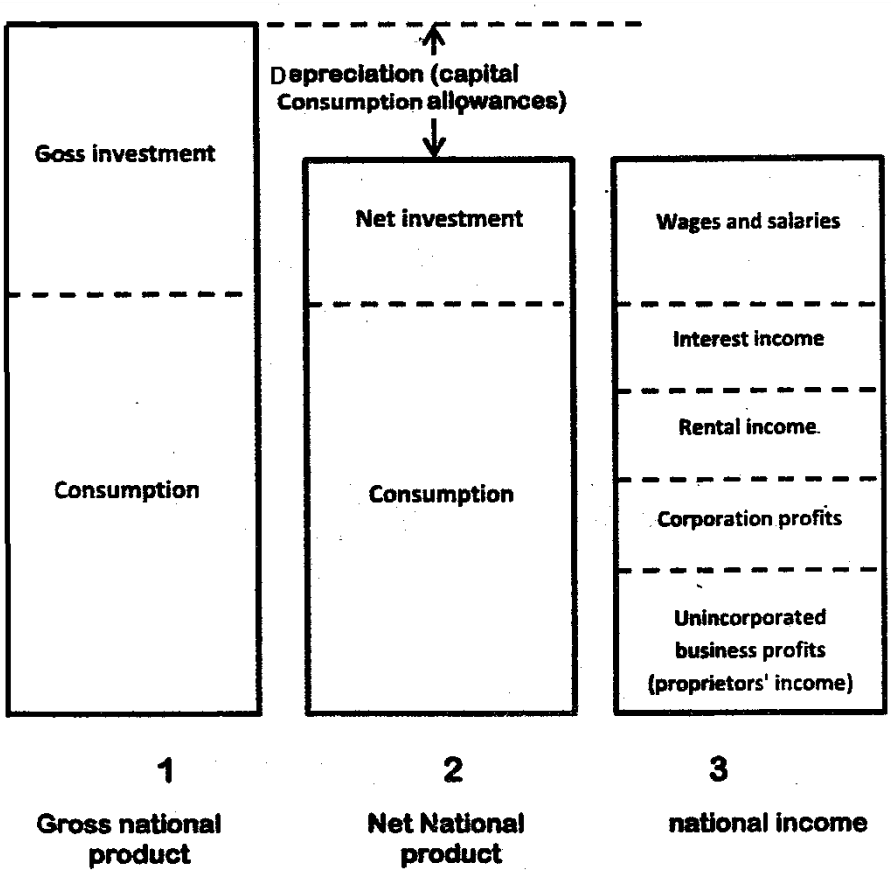

Fig.1

Our first rapid survey of the national income and-product accounts is completed. Various complications remain to be recognized-mostly arising out of government expenditure and taxation. With all such government items set aside, what has been said is summed up in fig.1. Its three columns correspond to the three measures discussed: GNP, NNP, and NI. The GNP column divides between Gross investment and consumption; NNP between Net investment and Consumption; and NI

divides into the five income categories. NNP differs from GNP only by the measure of Depreciation. NI is exactly the same as NNP– although when we come to recognize taxation, we shall find that one set of taxes causes NI to fall short of NNP, just as (because of depreciation) NNP falls short of GNP.

Study Fig.1 and the material preceding it until you feel you have a fair grasp of the ideas involved. Now there are complications to master. They can seem painfully difficult unless you recognize them for what they are: necessary adjustments (most of them fairly small) to be made within a framework of basic ideas.

Figure 2 is an extended version of fig.1. You have already mastered almost half of this larger (and seemingly involved) diagram: its three left-hand columns correspond to those of fig.1– save for only two changes: GNP and NNP now include a "Government purchases" block, and NI now falls short of NNP by reason of indirect business taxes."

5– a. All goods and services purchased for the public through the agency of government (federal, state, or local) count in GNP and NNP– assuming they were produced within the year in question.

Many such goods will have gone through the market system in that they were produced by a private firm and sold to a government. But- save for a few items like (national defense/ post office services)-they are not sold to the public for a price per unit. The public (gets them entirely free / pays for them via taxation).

b. All these goods and services enter the GNP and NNP totals valued at the price the government paid for them. A judge's legal services are valued at the salary paid that judge; the production of a new typewriter is valued at the price the government paid the typewriter-manufacturing firm.

Incomes earned via production of such government-purchased goods and services are (counted/ not counted) in NI: as the GNP and NNP columns grow by reason of government purchased. the NI column (grows also /does not grow).

You can well argue that GNP and NNP do not need this third component, since every cent of "Government purchases" should count either as the consumption (e.g,. services furnished by a police officer in protecting the public) or as investment (e.g,. construction

and purchase of some long-lived item like a new highway). But the Government-purchases category is kept separate, largely because government statistics are not kept so as to make possible a meaningful division between consumption and investment within this category, (and it is most helpful analytically to have it kept separate).

c. currently produced, Hence, one important category of federal expenditure (and to a lesser degree, of state and local expenditure) is not included: payments under the social security program and the like. These are "transfer payments". The recipient of such a transfer payment, by definition (must give something/ does not give anything) concurrently in return.

d. Suppose that, in addition to the $1.200 in private purchases of question 1, we had to recognize government expenditure on goods and services totaling $400. and health and welfare expenditures (payments made to social security beneficiaries) of $100. If depreciation is still $50. then GNP would now be $(1.200/1.250/1.550/1.600/1.700). and NNP would be $(1.200/1.250/1.550/1.600/1.650). The required increase (from the original GNP of $1200) would be in (GNP only /GNP and NNP. not

NI/ all of GNP, NNP, and NI). and the amount of this increases would be $(100/400/500).

a
b
c
d

6- Consider now the " indirect' business taxes " which, in fig.2. cause NI to fall short of NNP.

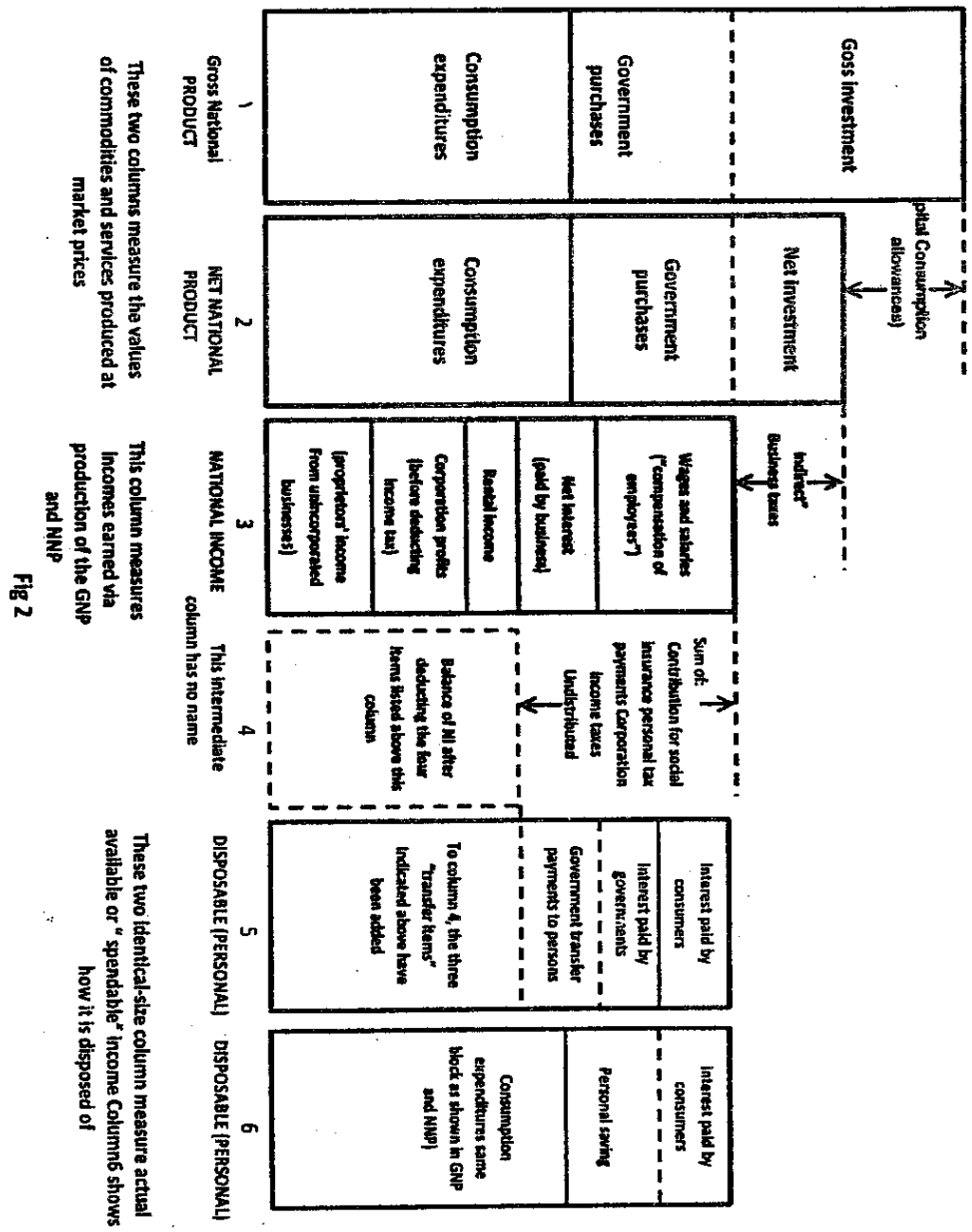

Fig 2

There are two kinds of taxes. One is epitomized by the personal income tax. It is levied on, and paid out of, income; and there is little doubt that the burden of this tax rests on the person who must pay it.

But consider another tax: a property tax on business buildings or land, is this tax ultimately paid by the owners of that business firm, via a reduction in profit earned? More probably, it is paid by the firm's customers via an increase in the price changed for the firm's product.

Consider still another tax: an excise tax on cigarettes. The cigarette- manufacturing firm pays that tax to the government. But cigarette firms shift" the tax, or at any rate a good part of it, by raising the price of cigarettes.

The important point here is that the items entering into GNP and NNP are valued at market price. Most taxes levied on business property taxes, excise taxes-almost certainly do elbow their way into market price, at least in part, probably in full, The GNP and NNP totals are intended as the measure of a certain volume of real production, valued at its market price. This market-price value must (be less than /exceed) the total of money income earned from that volume of real production, because of the business taxes which work their way into market price. A part from depreciation, already taken account of in NNP, it is almost exactly correct to say that such "indirect taxes" mark the only difference between the dollar value of what is produced and the dollar total of what

is earned. (Almost exactly correct, "and not exactly correct, " because if you look in the Surgery of Current Business, the monthly publication in which the Commerce Department reports all the national-product and-income figures, you will find three small items[2], other than indirect business taxes, which differentiate NI from NNP. They are of minor importance, and should be disregarded completely in a first approach to this detail-filled subject.)

The national income statisticians count any tax levied on a business firm- with one important exception- as an indirect business tax which marks a difference between total NNP and total NI Such taxes are assumed to be shifted by the business firm, via an increase in market price.

The one important exception is the corporation income (profits) tax. This is treated as a tax not shifted, as a tax on shareholder

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[2] They are:

a. the statistical discrepancy. "the commerce Department collects its figures from both production and earnings sides; they do not come out exactly equal. Considering the obvious difficulties in collecting complete and accurate data, it is remarkable that this discrepancy should be so small in comparison with the totals involved.

b. Business transfer- payments. To make an allowance for such things as uncollectible debts.

c. Subsidies less current surplus of government enterprises an adjustment needed because of such thing as the post office, where the price charged for serves does not necessarily match cost of providing those services.

income.[3] Hence it (is /is not) included among the indirect business taxes.

National income is a useful concept. For example, the figures within it will give you at least a rough comparison between the total of incomes earned through personal effort and the total of those obtained through ownership of property. But for many purposes, national income is less interesting than disposable income:

Disposable income is a measure of the total of incomes which people can actually dispose of (spend of save) as they wish.

In strict Department of Commerce Terminology, it is disposable personal income (DPI). But it has become customary to abbreviate this, as the text does, to disposable income (DI).

National income (NI) and disposable income (DI) are closely related. But they differ for two basic reasons:

1- National income is total earned income. Your take-home pay (which is pretty much the idea that disposable income seeks to convert) will

[3] - This handing is open to dispute; for a brief discussion of possible shifting of the corporation income tax. However, the preparation of statistics cannont be held up unit all the truth becomes available. The rules here balance up the available evidence pro and con best you can, then you make a decision. All such decisions have their arbitrary element; there is always some contrary evidence that must be ignored.

be less than your total earnings. There will be several deductions from your wage or salary check, all major deduction of this nature must be subtracted from the NI total in order to reach DI.

2- National income includes only earned income. There are some money payments whose recipients most certainly consider them to be spendable income yet they are not payments for having helped to make some part of the national product. Accordingly, they are not included in NI. But they must be added to NI if we want to reach DI.

Unfortunately, there are (in all) no less than seven of these adjustments to make: four subtractions (question 7), and three additions (question 8) Fortify yourself by noting that (with one possible exception) none of these items is complicated.

7- The four required deduction are listed above column 4 in fig.2. The first two (Contribution for social insurance and personal tax payments) are obvious your salary check will be less than your total earnings by reason of such deductions. (Personal tax payments

include not only the federal income tax but other taxes levied on individual–e.g,. local government property taxes.)[4]

The third and fourth deductions pertain entirely to corporation profits: they bring such profits down to the level of dividends actually received by shareholders. This dividend total is less than the profits total for two reasons: (a) the corporate income tax must be paid out of profit. (b) Corporations do not distribute all of their after tax profit as dividends. (Undistributed profits are the Additions to retained earnings.

So if before–tax corporation profits were $100. if the total corporate tax was $50. and dividends were $20. then undistributed corporate profits must have been $(10/20/30/40/50). Disregarding social insurance contributions and personal taxes, the amount to deduct from NI in moving toward DI – that is, the total amount to be deducted from before–tax corporate profits in order to get DI in the form of dividends– would be $(40/50/60/70/80/90).

[4] – the Commerce Department also includes in this item some nontax payments to government"; these are of minor importance

If NI is $600. social insurance contribution are $15. personal tax payments are $120. and corporate taxes and undistributed profits are as stated above, then the size of Column 4 in fig.2 would stand for a figure of $(285/315/385/420/495).

8- what's left, after deduction from NI of the four items just discussed, is Column 4 in fig 2.

To reach disposable income we need only stack three blocks of non-earned income or transfer payments on the top of Column 4. The result is Column 5; it is DI.

a. Begin with the bottom added block (in column 5): Government transfer payments to persons.[5]

A typical item here would be a $200 social security check paid to a retired worker. Such expenditure by government (would/ would not) be included in the Government purchases sector or block of GNP and NNP. It (would/would not) be included in the NI total. (Remember: NI is

[5] - don't get mixed up by thinking that if this $200 is spent on consumption goods, the transfer payment really does sneak into GNP and NNP, via the back door of consumption. Keep your transactions separate. One transaction is the transfer payment by government to the individual: it doesn't count at all in GNP and NNP. Another transaction, following this payment, is the consumption expenditure. This does count; $200 in GNP and NNP as the purchase of the current output of consumption goods; $200 (or something less than) in NI as the earnings of those produced those consumption goods.

earned income. income paid for some contribution to current production.)

Nevertheless. the recipient of this $200 check certainly considers it income; most or all of it will be spent on consumer goods 5. So it must be included in DI (the total of spendable income) regardless of whether it was earned income or not.

Thus, to the dollar figure represented by the size of column 4 in fig 2 we must (add/ subtract) the total of all such government transfers.

b. the next block included in column 5 is: interest paid by governments.

If you receive interest on money loaned, you will count that interest as part of your spendable (i.e,. disposable) income. If that loan was made to finance any part of production (i.e,. if it was money loaned to a corporation or an unincorporated business). it already counted, It is within the second block (net interest paid by business) of Column 3; and what remains of that interest income after personal taxes is in Column 4 and in the large bottom block of Column 5. DI column.

But suppose your interest comes from a government bond. This is not chalked up in the statistics as earned income (i.e,. as part of NI). It (is L is not) in Columns 3 or 4. It is considered a transfer payment from government to you, nevertheless, it (does L does not) count as part of DI – and so must be added in when moving from NI to DI.

This handling of government paid interest is open to some dispute. The somewhat paradoxical result which emerges is that interest paid you on a corporation bond is counted within NI (it is earned income); interest paid you on a government bond is not.

The reasoning here is that the total amount of governmental debt– hence the total amount of interest paid out by governments– bears little relation to the amount of goods and services produced through the agency of government. The best supporting argument is the federal debt. Much of this was first incurred during World War II; the debt grew enormously during that war, and doubtless contributed to production at that time. But the war is part of history now. Today, the total output of goods and services produced through the agency of government would presumably be much the same were the public debt much smaller or much bigger.

When statistics must be published, rules must be set for their construction. Sometimes these rules contain an arbitrary element (as already noted regarding the corporation income tax). On your first approach, complications such as this one are of minor importance. Just note that any receipt of interest paid by a business firm (is L is not) considered part of earnings from production; if a government pays interest (or if a consumer does – an item still to be considered). it is a transfer payment.

(notice, though, that government's interest payments are, in the statistics, kept separate from the other government transfers. That is, there two Government transfer payment blocks in Column 5. It is almost as though the commerce Department's conscience were not entirely clear on this issue; it segregates such interest payment from the other transfers.)

c. Finally. the remaining blocks in Column 5: interest paid by consumers.

The reasoning here is much the same as that just outlined in part b. you may receive interest on a loan made, not to any business, not to any government, but to an individual or family, to finance a consumer

purchase (e.g,. a new automobile). In such a case, the loan did nothing to assist production[6], and the interest payment does not show up in Columns 3 or 4. Nevertheless, it is still disposable income. So the total of such consumer-loan interest payments is included the DI total.

Question 7 used at its close an example in which NI was $600 and the four deductions from NI were specified. Using the same figure. and assuming the totals of interest paid by consumers, interest paid by governments, and other government transfer payments to be $20. $15. and $25. respectively. then the amount of DI – column 5 – would be $(445/480/490/500/505).

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a

b

c

9- Column 5 depicted the total of disposable income received: the remainder of national income after deductions. plus the three transfer items.

[6] – if you are tempted to argue that loan did assist production, because the automobile woudn't have been sold without it, consider further, doubtless the loan helped to sell the car, and its purchase price will have been included within the consumption expenditures "Block of column 1 and 2 (for the period within which it was sold) but nothing about the making of that consumer loan actually helped in the process of converting iron ore, plastics, and other materials into a shiny new automobile.

Column 6 also shows DI: it is exactly the same column as column 5. But it shows what people do with their disposable incomes. Basically, there are just two things to do with it: spend it on consumption goods, or save it, (strictly, there are three things to do with DI; we'll get to the third in a moment.)

The bottom consumption expenditures block in column 6 is exactly the same block as appeared in column 1 and 2. (if you like, appearance of this block in the first two columns records the production and sale od all these consumer goods and service; its appearance in column 6 records the purchase of these same items.)

Personal saving, the second block in column 6. is – by definition– that part of DI which is not spent on consumption goods or services (or not used to pay interest on consumer loans, the remaining column 6 block)[7].

That leaves the top block, interest paid by consumers, It is exactly the same block as appeared in column 5. and you may wonder why it is making a second appearances. Well, perhaps the first thing to keep in mind is that this item really isn't very important– not on a first approach

[7] – the statistics do not record, and are not intended to record, what people do with their saving e.g., buy securities with it. Put it in the bank, hide it in the mattress, etc.

to the intricacies of national-product and national- income accounting, at any rate. You can probably lead a reasonable happy and prosperous life without having paid lavish attention to this statistical item.

Nevertheless, the logic of the entry is simple. One part of the public lends money (for the financing of consumer- good purchases and receives interest thereon. Another part of the public borrows that same money. and pays that same amount of interest on it. Column 5 recorded the receipt of interest; column 6 records the payment.

You may reasonable argue that this is just a private transfer of funds from one sector of the consuming public (borrowers) to another sector (lenders); it could be left completely out of these statistics, thereby dispensing with one complication faced by the beginning student. He commerce department felt otherwise. Credit buying is now widespread, and with the marked increase in interest rates that has developed in recent years, the total of consumer interest payments has risen sharply. It is a statistic of interest; the commerce Department wanted to include it (its inclusion is a recent change); and this was the only way to get it in, your policy should be to accept Commerce's decision philosophically, and with stern fortitude. Just remember: interest

paid by consumers is included in the DI total. whether you are considering DI as income received, or income disposed of.

10- On your first reading, Skip this material and move on to question 11. The purpose of the lengthy outline preceding is to take you through national-income and product material in just. Enough detail that you can interpret the statistics found in the survey of Current Business. The two items briefly discussed below appear within those statistics; you may wonder what they mean. But both are of rather minor importance, and should be disregarded on a first survey.

Personal income: The Commerce Department's full name for what we have called disposable income is disposable personal income." Commerce uses also the term "personal income" is a way station on the journey from NI to DI. It almost reaches DI; but it does not exclude personal tax payments. DI is by far the more useful concept. But there is a quickly published personal income statistical series which is often consulted as an indicator of the trend of the more slowly available DI series.

Inventory Valuation adjustment and capital consumption adjustment: the survey of current business statistics adjust corporation profits. The conventions of business accounting and auditing were developed in noninflationary times, one major purpose being to prevent any overstatement of the company's profit, Ironically, the advent of price inflation has led these conventions to yield the reverse effect.

A firm's inventory asset is valued at the lower of cost or market value. In an inflationary period, it will cost more than either earlier-period cost or current market value to replace that inventory as it is depleted. This is not recognized in the firm's recorded profit figure. Similarly, it will cost the firm more to replace its capital assets when they are worn out; but depreciation expense is based on original cost, not replacement cost. There is no allowance in stated profit for this impending cost increase. So the Commerce Department corrects (i.e,. reduces) the stated profits figures to compensate for these neglected factors.

11. This question asks you to compute (for three different situation) GNP, NNP, NI, and DI totals by fitting together bits and pieces of information. The key fig. 2. Every line in the table following matches an

item within that diagram. Your task is to find enough figures that you can build one complete column (GNP, NNP, NI or DI) then work to other columns.

The figures are billions of dollars, and refer to some year such as 1980. An "X" opposite any item means that its value is not given you.

Do at least one of these problems and if your time can possibly permit, do all three, Working this type of problem is most useful in gaining familiarity with national-product and-income figure

	problem		
	a	b	c
Capital consumption allowance.....	10	25	10
Consumption expenditures	100	180	X
Contributions for social insurance.....	0	10	5
Corporation income taxes.....	15	15	10
Corporate profits before taxes.....	X	X	50
Govt. purchases of goods and services	50	X	50
Govt. transfer payments to persons (other than interest payments).....	5	15	15
Gross investment.....	X	X	55
Indirect business taxes.....	20	30	40
Interest paid by consumers.....	10	5	5
Interest paid by governments.....	5	10	5
Net interest (paid by business).....	X	X	10
Net investment.....	50	X	X
Personal saving.....	X	40	30
Personal tax payments.....	15	25	20
Proprietors' income (from unincorporated businesses).....	X	X	20
Rental income.....	X	X	20
Undistributed corporation profits.....	10	5	10
Wages and salaries.....	X	X	250

For each problem compute:

	a	b	c
Gross national product.....	_____	_____	_____
Net national product.....	_____	_____	_____
National income.....	_____	_____	_____
Disposable(personal) income.....	_____	_____	_____

a. The only column you can immediately fill is NNP; for this you have consumption (100), government (50), and net investment (50). The total of these makes an NNP of 200. Add depreciation (10) to reach GNP. The various items needed to move from NNP to NI and to DI are all given.

b. Here you can start only with DI; but you have consumption (180). personal saving (40), and consumer interest payments (5); so DI is 225. From here, work backward to NI, NNP, and GNP.

c. This one requires you to start with NI; you have all the five categories of earnings" needed to fill out this column.

	a	b	c
Gross national product.....	210	305	400
Net national product.....	200	280	390
National income.....	180	250	350
Disposable(personal) income.....	160	225	330

12- using the same data furnished in question 11. compute- if you can – the total of the following (if the data supplied are insufficient and you cannot compute it, put an X in the space);

(1) personal saving (out of DI) in problem a ……._____

(2) consumption expenditure in problem c……._____

(3) Gross investment in problem a……._____

(4) Net investment in problem b……._____

(5) Dividends paid out by corporation in problem c……._____

(6) Government surplus or deficit in problem c……._____

(Note: Government's surplus or deficit here is simply the difference between total tax collections and other receipts and total money outlays. Remember that "Contributions for social insurance" count as a government receipt.)

1
2
3
4
5
6

13- One statistical problem is: how is the dividing line between consumption and investment drawn? What goes into the" Consumption expenditure" category of GNP and NNP, and what into Gross (or Net) investment"?

Ideally, the consumption figure should measure the goods and services not only produced during that year, but actually consumed during the year, (so that they were gone by the year's end). But there is no possible way of measuring this "true consumption, "the statisticians must content themselves with recording what consumers bought, Clothing, for example, may last much more than a year; but purchase of a new dress or suit is still treated as consumption during the year in which it was made and bought.[8]

Items consumed immediately or almost immediately after purchase (bread, for example) pose no problem. As to those which last (say) 2 or 3 year, the interpretation of consumer purchases as true consumption" still works fairly well, assuming that what is bought is pretty much a replacement for what is worn out through use. However, one item demands different treatment: housing. A house is far and away the longest-lived item a consumer ordinarily buys; it is typically the biggest purchase a person ever makes. It would be ridiculous to say that a house built in 1980 is fully "consumed" by the end of 1980.

[8] - Consumer items made during the year but not bought are dealt with in question 1.

The statistician handles this by saying: A house is an investment good, not a consumer good. It is a kind of machine for providing consumer services. What should be counted as consumption in 1980 GNP and NNP is the service which the house supplies- and indeed. if the house is rented, there is a market-price measure of the value of this service.[9]

With every house treated as a service-producing machine. the services supplied by that house are thus counted as consumption within GNP and NNP, valued at the market price of such services (rental value) for each year of its life that it is occupied. In the year it was built, the full construction value of the house is counted also but as an investment item, not as consumption[10]

---

[9] – if the house is owner occupied, the rental value of its services must be estimated: this is another exception to the general rule that goods and services go through the market mechanism.) such an estimate of the total value of housing services for owner- occupied houses goes into each year's Consumption expenditure for GNP and NNP.

[10] – is it double counting to include in the figures both the original purchase value of the new house and the value of the services that it supplies? Yes and no. the same is true of any other investment item- a machine or a factory building. The rent of a factory building works its way into the market price of the item produced therein. The use of a machine inside the factory does the same thing.) the key factor here is depreciation, does double-count. However, in net national product, the original value of the house is gradually subtracted from the national product, year by year, via depreciation, until (at the end of its life) the entire original purchase value of the house has been deducted. All that remains is the total value of the services which that house supplied. (Question 3 in the quiz other" Section covers this point

a. Suppose a house is built in the first half of 1980 and sold for $90.000. It is rented for the remainder of the year, total rental for the 6 months being $6.000. Depreciation for this same period is estimated at $600. In the 1980 statistics, the proper entries for this house would be:

Gross investment, $(zero/600/6.000/89.400/90.000);

Net investment, $(zero/600/6.000/89.400/90.000);

Consumption investment, $(zero/600/6.000/89.400/90.000);

b. Hence the total entries in 1980 GNP and NNP, with respect to construction and use of this house, would be:

GNP:$(89.400/90.000/95.400/96.000).

NNP:$(89.400/90.000/95.400/96.000).

A

B

Exercises

The following statements are true (T) or false (F)

1- A nation's gross national product (GNP) is the dollar value of the total output produced within the borders of the nation.

2- A nation's gross national product (GNP) can be found by summing C + S + G + Xn.

3- Gross national product (GNP) is a measure of the total output of goods and services produced in a given time period.

4- GNP includes both intermediate and final goods

5- Net national product (NNP) is GNP plus the capital consumption

6- The gross investment is total production of new capital goods without depreciation allowance.

7- The amount of after-tax income received by households is measured by the national income.

8- The net investment is value of new capital goods produced before a deduction for depreciation.

9- Social goods are produced through the agency of government

10 – GNP includes final goods

11- National income accountants can avoid multiple counting by only counting final goods

12- The social goods are not sold on the marketplace; but people pay for them through taxation.

13- The government purchases should count either as the consumption or as investment

14- The national income is the sum of indirect tax and net national product.

15- Transfer payments are included in the personal income.

16- The amount of interest paid by the producing firm to the lender is the amount of income earned by that lender.

17- The personal income tax is on business buildings or land.

18- The net national product can be measured through the gross national product minus depreciation.

19- Rental income-received by supplying land or other property to producing firms.

20- If intermediate goods and services were included in GNP, the GNP would be understated.

21- Disposable income is income minus taxes plus transfer payments.

22- The money value of the resulting total output each item valued at the market price for which it sold or would sell is the national product for that period.

23- if the MPC increases, the planned aggregate expenditure line becomes steeper.

24- The personal income tax paid by the firm's customers via an increase in the price changed for the firm's product.

25- GNP and NNP can be considered the total output produced and supplied by business firms.

26- The difference between total NNP and total NI is the direct tax.

27- When taxes are given as a percentage of income, a higher tax rate implies a higher multiplier.

28- The profit is the difference among the sales and cost.

29- In an open economy, the multiplier will be lower than in an economy without international trade.

30- Gross investment refers to, net investment plus net exports.

31- When we divide total national income by total population, we get per capita income.

32- Personal income is the amount that is actually received by the individuals during the year.

33- All goods and services purchased for the public through the agency of government count in GNP and NNP

34- Net national income is gross national income or gross national product less depreciation.

35- GNP differs from NNP in that; GNP is based on gross exports, while NDP is based on net exports.

36- The sum of the income received by factors of production in the form of rent, wages, interest, and profit is called national income.

37- Gross national product is defined as the total market value of all final goods and services produced in a year by nationals of a country both inside and outside the country.

38- The disposable income refers to income received by households less than personal taxes.

39- The corporation income tax is included among the indirect business taxes.

40- When depreciation is deducted from GNP, the net value is called the net national product.

41- NNP differs from GNP only by the measure of depreciation.

42- The average income of a country is called per capita income.

43- If depreciation exceeds gross investment, the economy's stock of capital is growing

44- Personal income is the amount that is actually received by the individuals during the year.

45- The national income is greater than the net national product.

46- The disposable income is total earned income.

47- The national income is sum total of factor incomes.

48- Every national uses its limited stock of labor power, machines, and materials to produce commodities and services.

49- A nation's stock of capital goods will decline when, depreciation exceeds gross investment.

Chapter Two

Chapter two

Consumption Function

Consumption and saving

The most important determinant of consumer spending is income and of course since saving is that part of income which is not consumed.

Consumption Function

Which illustrates the relationship between consumption and total income.

Economists distinguish between two categories, first that part o autonomic consumption, second dependent consumption

$$C = Co + Cy$$

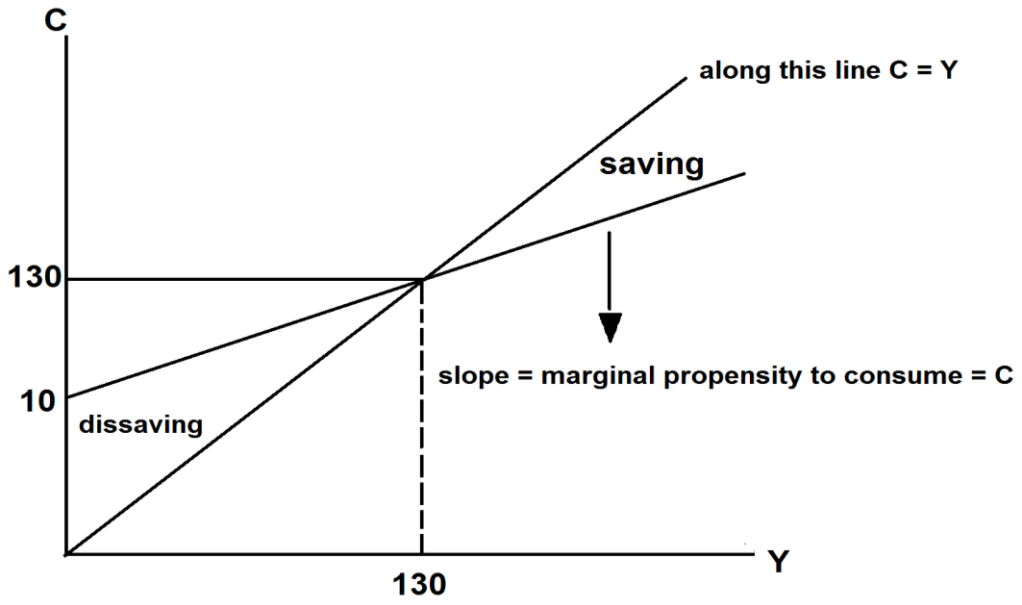
Where

Co = labeled autonomous consumption

Cy = consumption depend on income

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Y	Consumption	Saving	Average propensity to consume APC 2/1	APS 3/1	MPC Δ2/ΔI	MPS Δ3/ΔI
370	375	− 5	1.01	−.01	0.75	0.25
390	390	0	1.00	0.00	0.75	0.25
410	405	5	0.99	0.01	0.75	0.25
430	420	10	098	0.02	0.75	0.25
450	435	15	0.97	0.03	0.75	0.25
470	450	20	0.96	0.04	0.75	0.25
490	465	25	0.95	0.05	0.75	0.25
510	480	30	0.94	0.06	0.75	0.25
530	445	35	0.93	0.07	0.75	0.25
550	510	40	0.92	0.08	0.75	0.25

The Consumption Function E



Average propensity to consume (APC)

Average propensity to save (APS)

That fraction or percentage of any given total income which is consumed is called the average propensity to consume (APC).

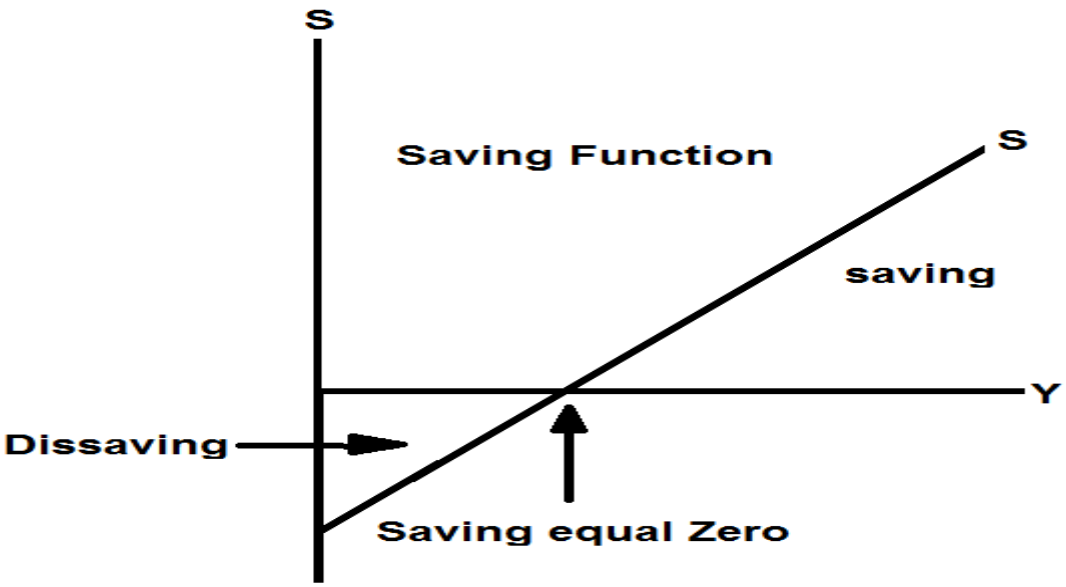
And that fraction of any total income which is saved is called the average propensity to save (APS) that is

$$APC = \frac{\text{Consumption}}{\text{Income}}$$

and

$$APS = \frac{\text{Saving}}{\text{Income}}$$

In short $APC + APS = 1$



MPC and MPS

The proportion or fraction of any change in income which is consumed is called the marginal propensity to consume (MPC)

$$\text{MPC} = \frac{\textit{Change in consumption}}{\textit{change in income}}$$

The sum of MPC and MPS for any given change in income must be always 1.

Investment

Suppose the investment independent on the income to analysis propose.

Question

Suppose that the linear equation for consumption in a hypothetical economy is C = $40 + 0.8$y. also suppose that income (y) = 400

Determine

1- The marginal propensity to consume.

2- The marginal propensity to save.

3- The level of consumption.

4- The average propensity to consume.

5- The level of Saving.

6- The average propensity to save.

Answer

1- MPC = 0.8

2- MPS = 0.2 because MPC + MPS = 1

3- Level of consumption C = $40 + 0.8(400) = 360$

4- APC = $\frac{C}{Y} = \frac{360}{400} = 0.9$

5- Level of saving = $400 - 360 = 40$

Or S = $-40 + 0.2(400) =$

S = $-40 + 80 = 40$

6- APS = $\frac{40}{400} = 0.1$

Suppose the consumption function as follows:

$$C = 200 + 0.75Y$$

Suppose also I constant and equal 40

Determine

1- Total income (Y).

2- Compute the form and value the simple investment multiplier.

3- Verify the equilibrium on macroeconomic level.

4- Present your answer graphically.

Answer

1- $Y = C + I$

$$Y = 200 + 0.75Y + 40$$

$$Y - 0.75Y = 240$$

$$Y(1 - 0.75) = 240$$

$$Y = \frac{1}{(1-0.75)}\ 240$$

$$Y = 4 \times 240 = 960$$

2- Multiplier form $\frac{1}{1-0.75} = \frac{1}{0.25} = 4$

3- The situation which macroeconomic equilibrium is occur when

Investment = saving

We can expect the saving function as inverse the consumption function

$$S = -200 + 0.25Y$$

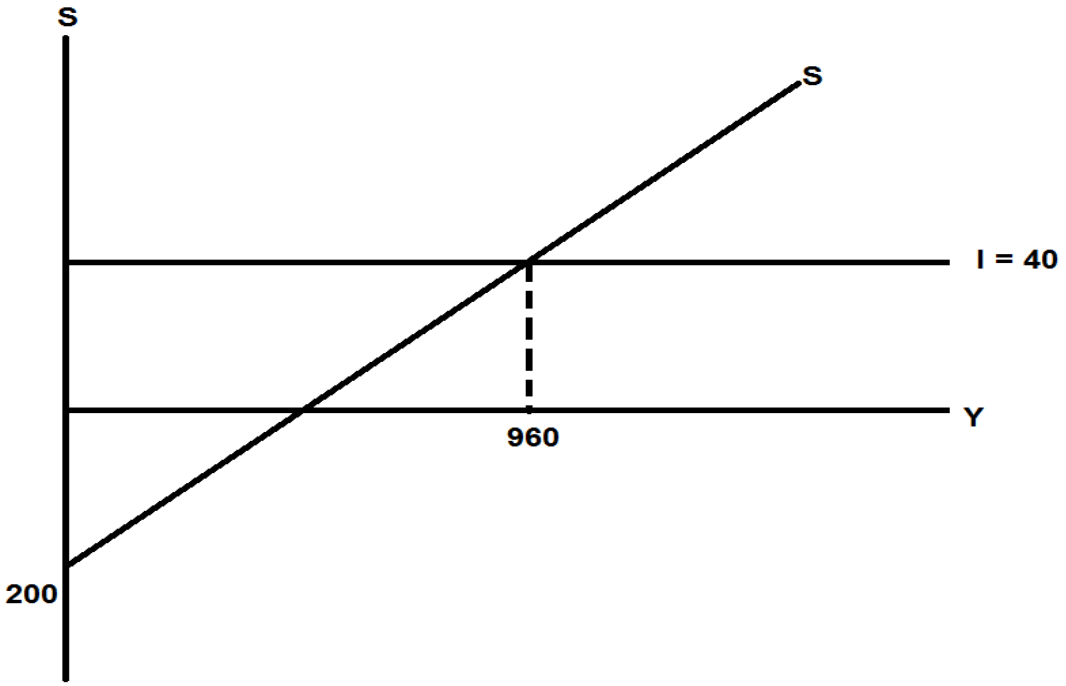
$$S = -200 + 0.25\ (960)$$

$$S = -200 + 240 = 40$$

Then

$$S = I$$

$$40 = 40$$



Suppose to rise the total income the Government added $\Delta I = 10$ compute the total income and present graphically

$$Y = C + I + \Delta I$$

$$Y = 200 + 0.75Y + 40 + 10$$

$$Y = 4 \times 250 = 1000$$

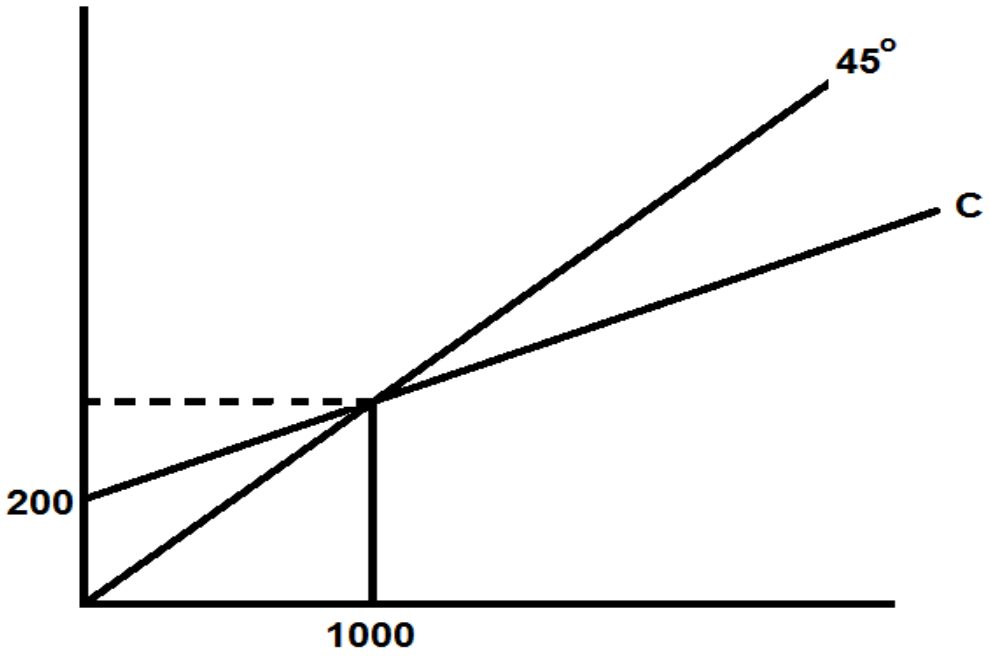
$$\Delta I = 10$$

$$\Delta Y = 40$$

Then the multiplier $\frac{\Delta \mathbf{Y}}{\Delta \mathbf{I}} = \frac{40}{10} = 4$

Suppose the consumption depend of Y_{t-1} complete the following table

$\frac{\Delta Y}{\Delta I}$	Y	C = 200 + 0.75Y	I = 40	ΔI =10	round
	960	920	40	—	Primer
$1 = \frac{10}{10}$	970	920	40	10	First
$0.75 = \frac{7.5}{10}$	977.5	927.5	40	10	Second
$0.56 = \frac{5.625}{10}$	983.125	933.125	40	10	Third
5	1000	950	40	10	Final



From the Figure determine

1- Consumption Function.

2- If the investment 80 compute Y

3- Confirm the equilibrium condition.

4- Present graphically.

Answer

1) From the figure we can get the saving function when income equal Zero.

$$S = -200 + SY$$

$$S = -200 + S(100)$$

We Know the saving equal Zero when income equal 1000

$$O = -200 + S(1000)$$

Then $200 = S(1000)$

$$S = \frac{200}{1000} = 0.2$$

Then MPC $= 0.8$

This implies the consumption function is

$$C = 200 + 0.8Y$$

2) $$Y = 200 + 0.8Y + 80$$

$$Y - 0.8Y = 280$$

$$Y(1 - C) = 280$$

$$Y = \frac{1}{1-C} \quad 280$$

$$Y = 2\ (280) = 1400$$

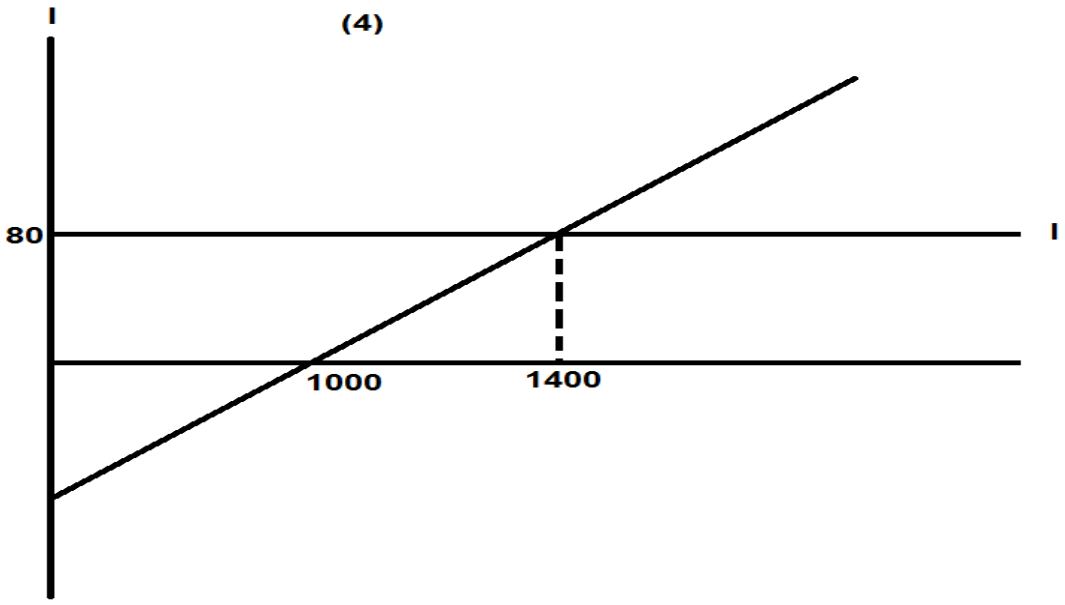
3) $$S = -200 + 0.2\ (1400)$$

$$S = -200 + 280 = 80$$

Then

$$S = I$$

$$80 = 80$$



Example

The Equilibrium closed economy with no Government

Suppose the consumption function as follow:

$$C = 200 + 0.75Y$$

Suppose also I constant equal 40

Required

1- Total income (Y).

2- Compute the form and value the investment multiplier.

3- Verify the equilibrium on macroeconomic level.

4- Present your answer graphically.

Answer

1- $Y = C + I$

$$Y = C_o + C_y + I_o$$

$$Y - C_y = C_o + I_o$$

$$Y(1 - C) = C_o + I_o$$

$$Y = \frac{1}{1-C} C_o + I_o$$

Then

$$Y = 200 + 0.75Y + 40$$

$$Y - 0.75Y = 240$$

$$Y(1 - 0.75) = 240$$

$$Y = \left(\frac{1}{1-0.75}\right) 240$$

$$Y = 4 \times 240 = 960$$

2) Multiplier form $\frac{1}{1-C}$

Multiplier value $\frac{1}{1-0.75} = \frac{1}{1-0.25} = 4$

3) The Situation which macroeconomic equilibrium is occur when

Investment = Saving

We can expect the saving function as inverse the consumption function:

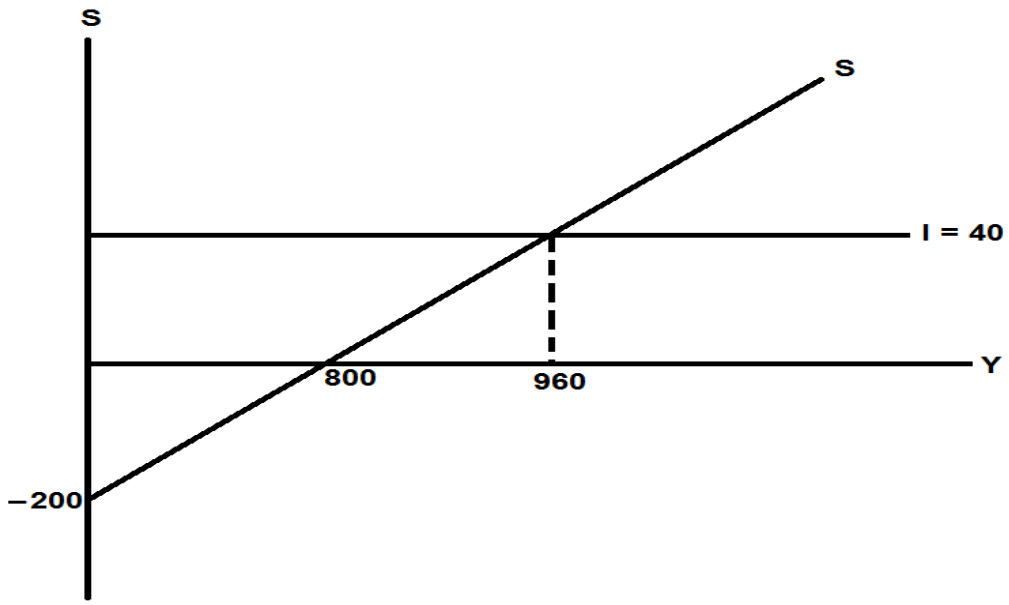
$$S = -200 + 0.25Y$$

$$S = -200 + 0.25(960)$$

$$= -200 + 240 = 40$$

Then $S = I$

$$40 = 40$$



To complete graph we should to compute the income level when the saving function cross the horizontal axes. We can do it by the following:

$$\text{If} \quad S = -200 + 0.25Y$$

Then by Substitute Saving equal Zero

Then

$$200 = 0.25Y$$

This means

$$Y = \frac{200}{0.25} = 800$$

Now suppose to rise this gross income, the Government added $\Delta I = 10$ .Compute the total income and present graphically

$$Y = C + I + \Delta I$$

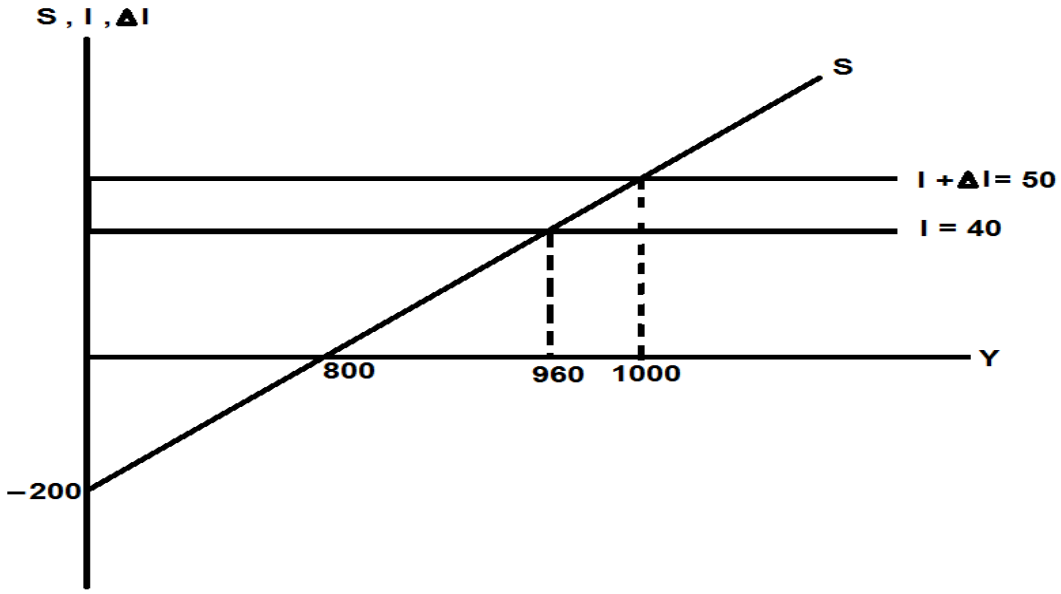
$$Y = 200 + 0.75Y + 40 + 10$$

$$Y - 0.75Y = 250$$

$$Y(1 - 0.75) = 250$$

$$Y = \left(\frac{1}{1-0.75}\right) 250$$

$$Y = 4 \times 250 = 1000$$



Now the income when saving function cross the horizontal axes equal don't change = 800 become the saving function do not change. But equilibrium condition occurs when new saving equal new investment.

Saving level $= -200 + 0.25(1000) =$

$-200 + 2509 = 50$

And investment plus $\Delta I = 40 + 10 = 50$

Now Suppose the consumption function depend on (Y_{t-1})

Complete the following table

$\frac{\Delta Y}{\Delta I}$	Y	C = 200 + 0.75Y	I = 40	ΔI = 10	Round
			40	—	Primer
			40	10	Frist
			40	10	Second
			40	10	Third
			40	10	Final

In the primer round $Y = 200 + 0.75Y + 40 = 960$

But $C = 960 - 40 = 920$

In the first round

$$Y = 960 + 10 = 970$$

But $C = 920$

Still $$\frac{\Delta Y}{\Delta I} = \frac{10}{10} = 1$$

Second round $C = 200 + 0.75\ (970) =$

$$200 + 727.5 = 927.5$$

Then $Y = 927.5 + 50 = 977.5$

Then $\Delta Y = 977.5 - 970 = 7.5$

$$\frac{\Delta Y}{\Delta I} = \frac{7.5}{10} = 0.75$$

In third round

$$C = 200 + 0.75\,(977.5)$$

$$200 + 733.125 = 933.125$$

$$Y = 933.125 + 50 = 983.125$$

$$\Delta Y = 983.125 - 977.5 = 5.625$$

Then $$\frac{\Delta Y}{\Delta I} = \frac{5.625}{10} = 0.56$$

Final round $Y = 200 + 0.75Y + 50 = 1000$

$$C = 200 + 0.75(1000) =$$

$$200 + 750 = 950$$

Then $$\frac{\Delta Y}{\Delta I} = \frac{40}{10} = 40$$

Chapter three

Chapter 3

Government spending and taxes

In a closed economy with a simple government sector, the equilibrium conditions are similar, only they be modified to make into account government spending and taxes, in such an economy $Y_d = C + I + G$ and economy $Y_s = C + S + T$ where both G and T are autonomous.

The three equilibrium conditions are:

1) $Y_d = Y_s$ or $C + I + G = C + S + T$

2) $I + G = S + T$

3) Unintended inventory investment is zero

The multiplier effect refers to the fact that changes in autonomous factors (for example $\Delta I, \Delta G, \Delta T$) cause changes in the equilibrium level of income (ΔY) that are a multiple of the change in spending. This means $({}^{\Delta Y}/_{\Delta I}, {}^{\Delta Y}/_{\Delta G}, {}^{\Delta Y}/_{\Delta T})$ is known as the multiplier.

In the simplest model, with induced and autonomous consumption. a MPC = C and autonomous I, G and T, the important multiplier are

Consumption spending multiplier = $\frac{1}{(1-C)}$ so that $\Delta Y = \left(\frac{1}{1-C}\right) \Delta C$

Investment spending multiplier = $\frac{1}{(1-C)}$ so that $\Delta Y = \left(\frac{1}{1-C}\right) \Delta I$

Government spending multiplier = $\frac{1}{(1-C)}$ so that $\Delta Y = \left(\frac{1}{1-\mathrm{C}}\right) \Delta G$

Tax multiplier = $\left(\frac{-\mathrm{C}}{1-\mathrm{C}}\right)$ so that $\Delta Y = \left(\frac{-\mathrm{C}}{1-\mathrm{C}}\right) \Delta T$

Problem

Suppose the government decides to increase its expenditures by 50 billion dollars. What effect will this have on income if MPC = 0.75

Solutions

This is a simple Keynesian multiplier problem. Aggregate demand equals the sum of consumption, investment and government expenditures

$$Y = C + I + G \qquad (1)$$

Consumption function is $C = co + cy$ (2)

By substituting (2) into equation (1)

$$Y = co + cy + I + G$$

$$Y - cy = co + I + G$$

$$Y(1 - c) = co + I + G$$

$$Y = \frac{1}{1-c}(co + I + G)$$

Taking changes and ignoring investment and autonomous consumption then $\Delta I = \Delta C = o$,

Then

$$\Delta Y = \frac{1}{1-c}\,\Delta G$$

Substituting the given values c = 0.15 and $\Delta G = 50$

Then

$$Y = (\frac{1}{1-0.75})\ 50 = (\frac{1}{0.25})\ 50 = 200$$

Thus the National Income will increase by $\$200$ billion

Fiscal policy and balanced budget

In the Keynesian view, the main channel by which fiscal policy affects the economy is through its influence on aggregate demand. Government spending is a component of aggregate demand, as the equation Y= C + I – G makes clear. Tax policy has its impact aggregate demand though its influence on consumer income, and hence on consumption and firm profits and hence on investment.

In simple models, the multipliers for fiscal actions can easily be derived assuming an economy where I is autonomous and only tax is on consumption, the equations for the effect of government spending tax policy and balanced budget policy (let C be the MPC).

Government spending

$\Delta \mathrm{Y} = \left[\frac{1}{1-\mathrm{C}}\right] \Delta \mathrm{C}$ where $\frac{1}{1-\mathrm{C}}$ Is the government spending multiplier

Taxation

$$\Delta Y = \left[\frac{C}{1-C}\right] \Delta T \quad \text{where } \frac{-C}{(1-C)} \text{ Is the tax multiplier}$$

Note that the government spending policy contemplates an increase (decrease) in spending with no change in taxes. This will result in an increase (decrease) in the government's budget deficit. Deficit spending is expansionary in Keynesian economics. Running a surplus is contractionary. The tax policy contemplates tax changes without spending changes, with similar inputs on the budget deficit.

Balance budget

$\Delta Y = 1.\Delta B$ Where, 1 is the balanced budget multiplier and ΔB stands for the change in the budget. The balanced budget case contemplates that both G and T are changed by the same amount in the same direction so the balance of the budget is not affected. Note that balanced budget increases are expansionary and decreases are contractionary.

What is fiscal policy?

Fiscal policy is the policy of the government with regard to the level of government spending and tax structure.

The national income identity states

$$C + I + G = Y = S + (T - R) + C$$

Where C = Consumption, I = Investment, G = Government expenditure, S = Saving, T = Taxes and R = Transfers. Fiscal policy determines quantities G, R and T directly and through the income determination process, determines Y, C , and S indirectly.

There are three Fiscal Model to including net taxes and government purchases and transfer payments.

We can present this model as follow

We know that

$$GNP = C + I + G$$

Or $$Y = C + S + T$$

Then, we have the following identity

$$C + S + T \equiv GNP \equiv C + I + G$$

By subtract C from two sides

Then we get the total injection equal the total leakage

$$S + T \equiv I + G$$

This implies

$$S + (T - G) \equiv I$$

This means the total saving equal or identity with total investment, note if the consumption function C = Co + CY_t

Where Y_t = Y − T where T taxes then

$$Y = Co + C(Y - T) + I + G$$

By rewrite and arrangement

$$Y = Co + CY - CT + I + G$$

$$Y - CY = Co - CT + I + G$$

$$Y = \frac{1}{1-C}(Co - CT + I + G)$$

Suppose there is change in Investment (I) or government level (G) or even the change in autonomous consumption (Co) thenΔG , ΔI , or ΔCo will cause change in ΔY like this

$$Y = \frac{1}{1-C}(Co - CT + I + G)$$

Then

$$Y + \Delta Y = \frac{1}{1-C}(Co - CT + I + G) + \frac{1}{1-C}\Delta I$$

By subtract Y from two sides

Then $$\Delta Y = \frac{1}{1-C}\Delta I = \frac{\Delta I}{1-C}$$

As the same way

$$\Delta Y = \frac{1}{1-C}\Delta Co = \frac{\Delta Co}{1-C}$$

Then we can say

$$\Delta Y = \frac{\Delta I}{1-C} = \frac{\Delta Co}{1-C} = \frac{\Delta G}{1-C}$$

From the way the change from T by the same size change from $\Delta I, \Delta Co, \Delta G$,then we get negative change income by the following equation

$$\Delta Y = \frac{-C\Delta T}{1-C} = \frac{-C}{1-C} = \Delta T$$

Then the tax multiplier $\frac{\Delta Y}{\Delta T} = \frac{-C}{1-C}$

The government multiplier $\frac{\Delta Y}{\Delta G} = \frac{1}{1-C}$

Also the investment multiplier $\frac{\Delta Y}{\Delta I} = \frac{1}{1-C}$

While the value of all multiplier depend on the MPC $\left(\frac{1}{1-C}\right)$ but by summation $\frac{\Delta Y}{\Delta G} + \frac{\Delta Y}{\Delta T}$ always equal 1.

This means when G size and T size equal (G = T) this is the Balance budget multiplier or balanced budget theory.

We can verification about this theory as follow; we can sum government multiplier and tax multiplier

$$\frac{\Delta Y}{\Delta G} + \frac{\Delta Y}{\Delta T} = \frac{1}{1-C} + \frac{-C}{1-C} = \frac{1-C}{1-C} = 1$$

Example

Suppose

$$C = 20 + 0.75Y \qquad I = 20 \qquad T = G = 0$$

Then

$$Y = C + I + G - T$$

Where

$$C = 20 + 0.75\,(Y - T)$$

$$Y = 20 + 0.75Y - 0.75(0) + 20 + (0)$$

$$Y - 0.75Y = 40$$

$$Y = \frac{1}{1-0.75}\,(40)$$

$$Y = 160$$

Suppose

$$G = 25 \text{ and } \quad T = 0$$

What is effect of this on the equilibrium situation

$$Y = \frac{1}{1-0.75}\,(20 - 0.75(0) + 20 + 25)$$

$$= 4(65) = 260$$

Suppose the government impose tax where $T = 25$ what is effect of balanced budget $(G = T = 25)$ on the equilibrium situation

$$Y = \frac{1}{1-0.75}(20 - 0.75(25) + 20 + 25)$$

$$Y = 4\ (20 - 18.75 + 20 + 25$$

$$Y = 4\ (46.25) = 185$$

The equilibrium condition

$$S + T = I + G$$

If

$$S = -S_0 + S(Y - T)$$

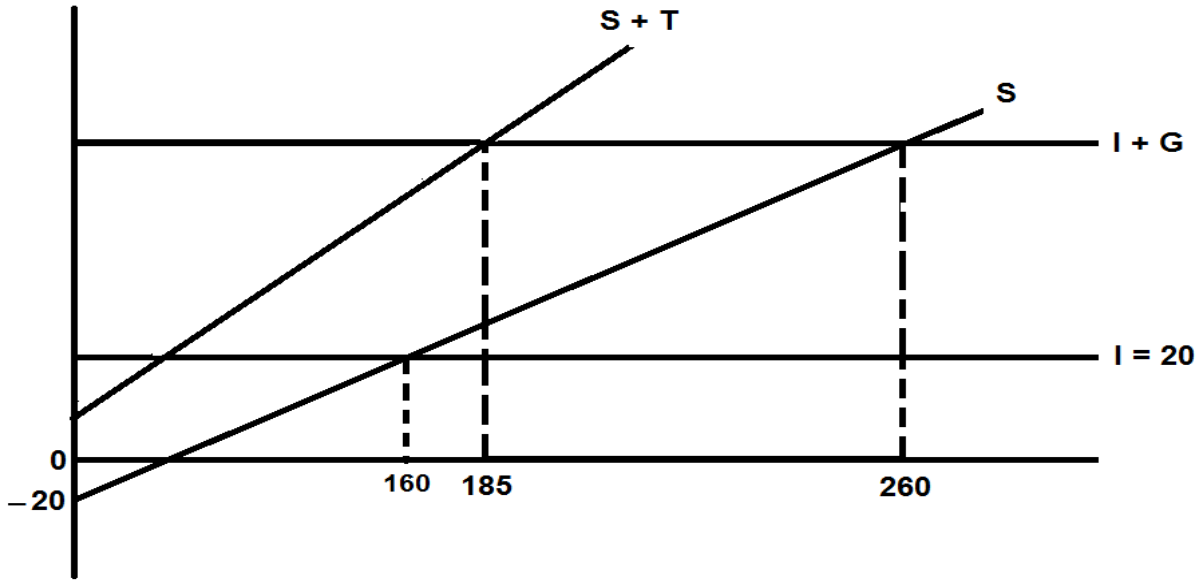
$$S = -20 + 0.25\ (185 - 25)$$

$$S = -20 + 40 = 20$$

Then

$$S + T = I + G$$

$$20 + 25 = 20 + 25$$



Second Fiscal Model

Including gross taxes government purchases, and transfer payments

$$C + S + T - R \equiv C + I + G$$

Where

$$Y_d = Y - T_g + R$$

Then

Consumption $C = Co + C\,(Y - T + R)$

Then $Y = Co + C(Y - T + R) + I + G$

$$Y = Co + CY - CT + CR + I + G$$

$$Y - CY = Co - CT + CR + I + G$$

$$Y = \frac{1}{1-C}\,(Co - CT + CR + I + G)$$

Now we have three multiplier

$$\frac{\Delta Y}{\Delta G} = \frac{1}{1-C} \quad , \quad \frac{\Delta Y}{\Delta T} = \frac{-C}{1-C} \quad , \quad \frac{\Delta Y}{\Delta R} = \frac{1}{1-C}$$

Example

Suppose

$C = 20 + 0.75Y$, $T = G = 25$, $R = 25$, $I = 20$

Then

$$Y = C + C\,(Y - T + R) + G + I$$

$$Y = 20 + 0.75\,(Y - 25 + 25) + 25 + 20$$

$$Y - 0.75Y = 20 - 18.75 + 18.75 + 25 + 20$$

$$Y = \frac{1}{1-C}\,(65)$$

$$Y = 4\,(65) = 260$$

Third Model

Including gross tax receipts as a function of income, Government purchases and transfer payment, we can present this model as follows

In the second model we know

$$Y = \frac{1}{1-C}\ (Co - Ct + CR + I + G)$$

Now Suppose the Government impose the taxes liner tax function in income as follow $T = T_o + ty$, where t the marginal propensity to tax (MPt) $\left(\frac{\Delta T}{\Delta Y}\right)$

Note the To as Co in the consumption function is autonomous, we can see the net tax function as follow $T = To + ty - R$,We can write the equilibrium equation

$$C + S + To + ty - R = Y = C + I + G$$

Now the disposable income equal

$$Y_d = Y - (To + ty) + R$$

Or

$$Y_d = Y - (To + ty) + R$$

And consumption function become

$$C = Co + C\,(Y - To - ty + R)$$

When the investment (I) and Government (G) constant and autonomous then the equilibrium income equation

$$Y = Co + C\,(Y - To - ty + R) + I + G$$

Rewrite this equation like this

$$Y - CY + Cty = (Co - Cto + CR + I + G)$$

$$Y[1 - C(1 - t)] = (Co - Cto + CR + I + G)$$

$$Y = \frac{1}{1 - C(1 - t)}\ (Co - Cto + CR + I + G)$$

Example

Suppose you have the following information about the economy

Firstly $C = 120 + 0.75Y$

$$I = 80$$

Required:

1- Find the total income

2- Determine the multiplier

3- Verify the equilibrium condition

4- Present graphically

Answer

1) $$Y = C + I$$

$$Y = 120 + 0.75Y + 80$$

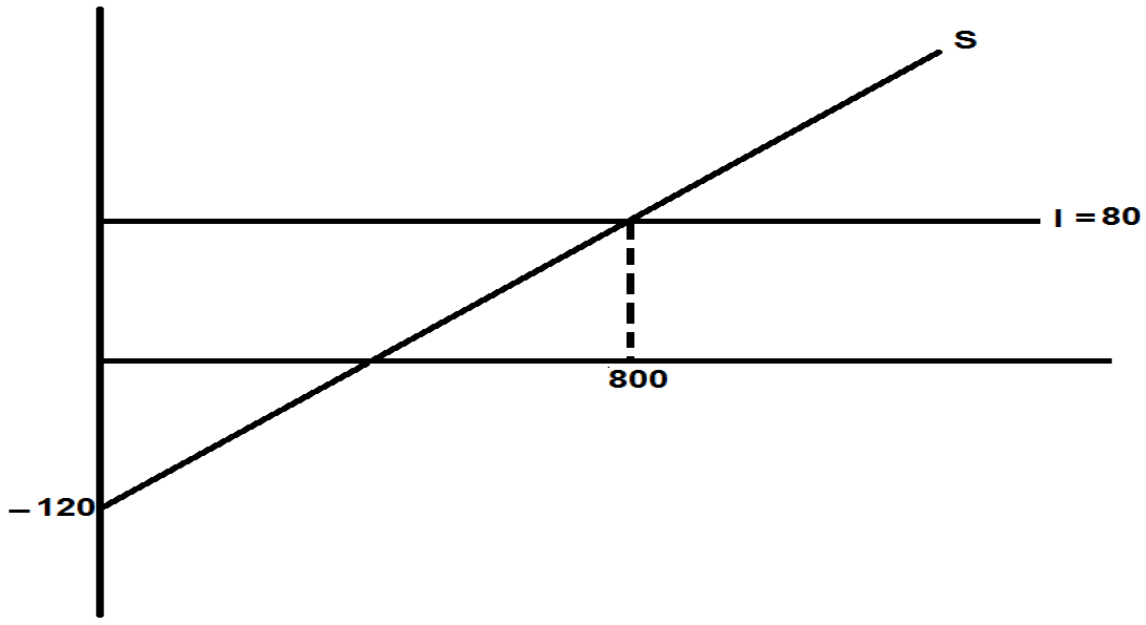
$$Y - 0.75Y = 200$$

$$Y\,(1 - 0.75) = 200$$

$$Y = \left(\frac{1}{1-0.75}\right)(200) = 800$$

2) The multiplier $\frac{1}{1-C} = \frac{1}{1-0.75} = \frac{1}{0.25} = 4$

3)



Equilibrium condition

$$S = I$$

$$S = -120 + 0.25\,(800) = 80$$

Then $S = I$

$$80 = 80$$

Secondly

Suppose the balance budget government is G = T = 60

Then

1) $$Y = C + I + G - T$$

$$Y = 120 + 0.75\,(Y - 60) + 80 + 60$$

$$Y = 120 + 0.75 - 45 + 80 + 60$$

$$Y - 0.75Y = 215$$

$$Y = \frac{1}{1-0.75}\ (215) = 4 \times 215 = 860$$

2) $$\Delta Y = \frac{1}{1-C}\ \Delta G$$

Then $$\frac{\Delta Y}{\Delta G} = \frac{1}{1-C} = \frac{1}{1-0.75} = 4$$

But $$\frac{\Delta Y}{\Delta G} = \frac{860 - 800}{6} = 1$$

But we know

$$\Delta Y = \frac{1}{1-C}(-C\Delta T) \quad \text{or} \quad \Delta Y = \left(\frac{-C}{1-C}\right)\ \Delta T$$

Then $$\frac{\Delta Y}{\Delta T} = \frac{-C}{1-C} = \frac{-0.75}{1-0.75} = \frac{-0.75}{0.25} = -3$$

Then balanced budget is the summation $\frac{1}{1-C}$ and $\frac{-C}{1-C}$

$$\frac{1}{1-C} + \frac{-C}{1-C} = \frac{1}{1-0.75} + \frac{-0.75}{1-0.75} = \frac{1-C}{1-C} = \frac{-0.75}{1-0.75} = 1$$

This implies when G = T = 60 ,the income change from 800 to 860

3) Equilibrium condition

$$S + T = G + I$$

$$S = -120 + 0.25\,(Y - 60)$$

$$S = -120 + 0.25\,(860 - 60)$$

$$S = -120 + 200 = 80$$

Then $$S + T = G + I$$

$$80 + 60 = 60 + 80$$

Thirdly

Suppose government imposed the tax as a function in income

$T = 40 + 0.2Y$

1) $$Y = 120 + 0.75\,(Y - 40 - 0.2Y) + 80 + 60$$

$$Y = 120 + 0.75Y - 30 - 0.75\,(0.2)Y + 80 + 60$$

$$Y - 0.75Y + 0.75(0.2)Y - 230$$

$$Y\,(1 - 0.75)(1 - 0.2) = 230$$

$$Y = \frac{1}{1-0.75(1-0.2)}\,230$$

$$Y = \frac{1}{1-0.6}\,(230) = 2.5\,(230) = 575$$

2) The Multiplier

$$\frac{1}{1-C(1-t)} = \frac{1}{1-0.75(1-0.2)} = \frac{1}{1-0.6} = 2.5$$

3) Equilibrium condition

$$S + T = I + G$$

$$S = -\,120 + 0.25\,(Y - 40 - 0.2Y)$$

$$S = -\,120 + 0.25\,[575 - 40 - 0.2(575)]$$

$$S = -\,120 + 0.25\,[575 - 40 - 115]$$

$$= -120 + 105 = -\,15$$

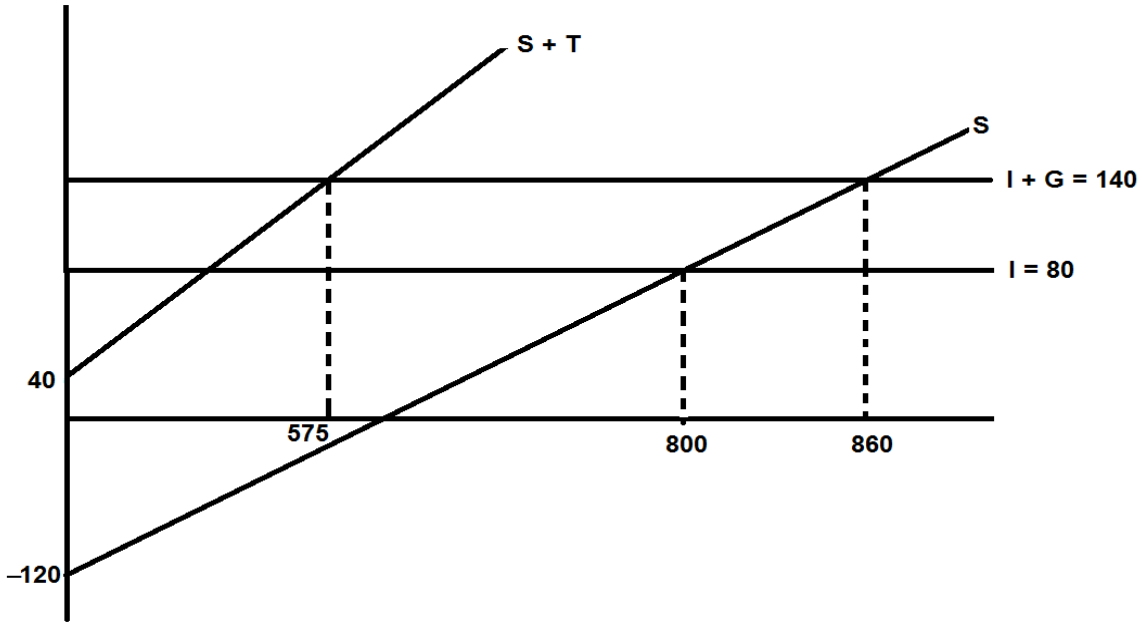
$$T = 40 + 0.2\,(575)$$

$$= 40 + 115 = 155$$

Then $S + T = I + G$

$$-15 + 155 = 80 + 60$$

$$140 = 140$$



General example

At all the following stage

1- Determine the national income (Y).

2- Determine the form and value multiplier.

3- Verify the economic equilibrium.

4- Show that graphically.

First stage

$$C = 200 + 0.8Y$$

$$I = 100$$

Second stage

$$G = 40 \qquad T = 20 + 0.25Y$$

Third stage

$$X = 50 \qquad M = 50 + 0.1Y$$

Answer

First stage

1) $$Y = C + I$$

$$Y = 200 + 0.8Y + 100$$

$$Y - 0.8Y = 300$$

$$Y - 0.8Y = 300$$

$$Y\,(1 - 0.8) = 300$$

$$Y = \frac{1}{1 - 0.8}\ 300$$

$$Y = 5 \times 300 = 1500$$

2) The multiplier form $\frac{1}{1 - C} = \frac{1}{1 - 0.8} = 5$

3) Verify the economic equilibrium

$$S = -200 + 0.2Y$$

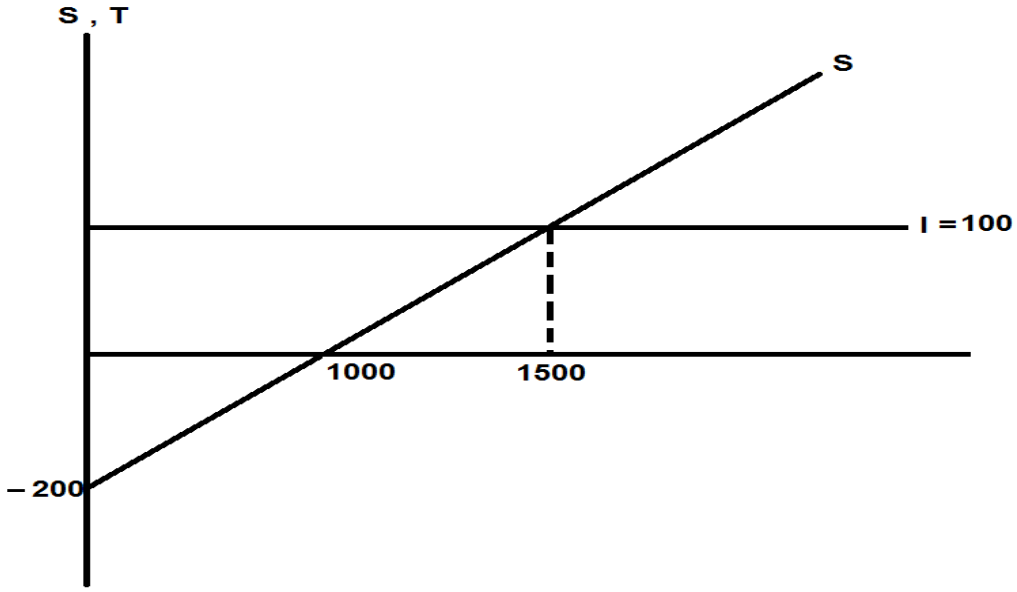
$$S = -200 + 0.2\,(1500)$$

$$S = -200 + 300 = 100$$

Then $S = I$

$$100 = 100$$

4) Graphically



Then the income when saving equal Zero

$$S = -200 + 0.2Y$$

$$200 = 0.2Y$$

$$Y = \frac{200}{0.2} = 1000$$

Second stage

1) $$Y = C + I + G - T$$

$$Y = co + c(y - to - ty) + I + G$$

$$Y = co + cy - cto - cty + I + G$$

$$Y - cy + cty = co - cto + I + G$$

$$Y(1-c(1-t) = co - cto + I + G$$

$$Y = \frac{1}{1-c\ (1-t)}\ co - cto + I + G$$

$$Y = 200 + 0.8\ (Y - 20 - 0.25Y) + 100 + 40$$

$$Y = 200 + 0.8Y - 16 - 0.8\ (0.25)Y + 100 + 40$$

$$Y - 0.8Y + 0.8\ (0.25)Y = 200 - 16 + 100 + 40$$

$$Y\ (1\ -0.8(1 - 0.25) = 324$$

$$Y = \frac{1}{1\ -0.8(1\ -\ 0.25)}\ 324$$

$$Y = \frac{1}{1\ -0.6}\ 324$$

$$Y = 2.5 \times 324 = 810$$

2) The form of multiplier $\frac{1}{1\ -c(1-t)}$

The value of multiplier = $= \frac{1}{1\ -0.8(1\ -\ 0.25)} = \frac{1}{1\ -06} = \frac{1}{0.4} = 2.5$

3) Verify the equilibrium

$$S + T = I + G$$

$$S = -200 + 0.2\,(Y - 20 - 0.25Y)$$

$$S = -200 + 0.2\,(810) - 20 - 0.2\,(0.25)\,810$$

$$S = -200 + 162 - 4 - 40.5$$

$$S = -244.5 + 162 = -82.5$$

$$T = 20 + 0.25\,(810) =$$

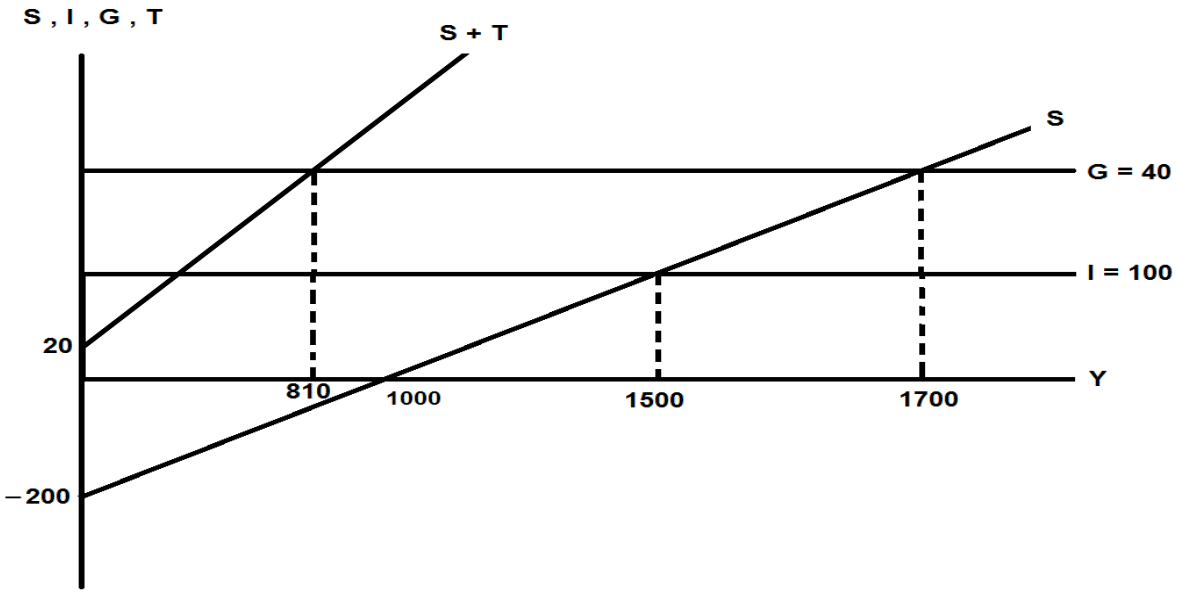
$$20 + 202.5 = 222.5$$

Then

$$S + T = I + G$$

$$-82.5 + 222.5 = 100 + 40$$

$$140 \qquad 140$$



1- Determine the saving function

2- Determine the government expenditure

3- Determine the tax function

Answer

1- To determine the saving function we need to get the marginal propensity to saving as follow

At $Y = 1500$ $S = I$

Then

$$100 = -200 + SY$$

Then

$$300 = 1500S$$

$$S = \frac{300}{1500} = \frac{1}{5} = .2$$

Then

$$S = -200 + 0.2\,Y$$

2) Suppose we unbeknown the government expenditure

If we Know $\frac{\Delta Y}{\Delta G} = 5$

Then $\Delta Y = 1700 - 1500 = 200$

$$\frac{\Delta Y}{\Delta G} = \frac{200}{\Delta G} = 5$$

Then $G = \frac{200}{5} = 40$

3) We known

$$Y = 200 + 0.8\ (y - ct - ty) + 100 + 40$$

$$Y = 200 + 0.8Y - 16 - 0.8t\ (810) + 100 + 40$$

$$Y - 0.8Y + 0.8ty = 324$$

$$Y = (1 - 0.8(\ 1 - t) = 324$$

$$810\ (1 - 0.8(1 - t) = 324$$

Then

$$(1 - 0.8\ (\ 1 - t) = \frac{324}{810}$$

$$(1 - 0.8\ (1 - t) = 0.4$$

$$(1 - 0.8 + 0.8t) = 0.4$$

$$0.2 + 0.8t = 0.4$$

$$0.8t = 0.2$$

$$t = \frac{0.2}{0.8} = 0.25$$

Then

$$T = 20 + 0.25y$$

Third stage

$$X = 50 \qquad M = 50 + 0.1y$$

$$Y = 200 + 0.8(y - To - ty) + 100 + 40 + (X - M)$$

1) $$Y = 200 + 0.8\,(y - 20 - 0.25y) + 100 + 40 + (50 - 50 - 0.1y)$$

$$Y = 200 + 0.8y - 16 - 0.8(0.25)y + 100 + 40 - 0.1y$$

$$Y - 0.8y + 0.8(0.25)y + 0.1y = 324$$

$$Y(1 - 0.8(1 - 0.25) + 0.1 = 324$$

Then

$$Y = \frac{1}{1 - 0.8(1 - 0.25) + 0.1}\ 324$$

$$Y = \frac{1}{1 - 0.8(0.75) + 0.1}\ 324$$

$$Y = \frac{1}{1 - 0.6 + 0.1}\ 324$$

$$Y = \frac{1}{0.4 + 0.1}\ 324$$

$$Y = 2 \times 324 = 648$$

2) multiplier form $\frac{1}{1 - 0.8(1 - 0.25) + 0.1} = \frac{1}{1 - 0.6 + 0.1} = \frac{1}{0.4 + 0.1}$

$$= \frac{1}{0.5} = 2$$

3) Verify equilibrium

$$S + T + M = I + G + X$$

$$S = -200 + 0.2(648 - 20 - (0.25)648) =$$

$$= -200 + 129.6 - 4 - 32.4 =$$

$$= -236.4 + 129.6 = -106.8$$

$$T = 20 + 0.25\ (648) =$$

$$20 + 162 = 182$$

$$M = 50 + 0.1\ (648)$$

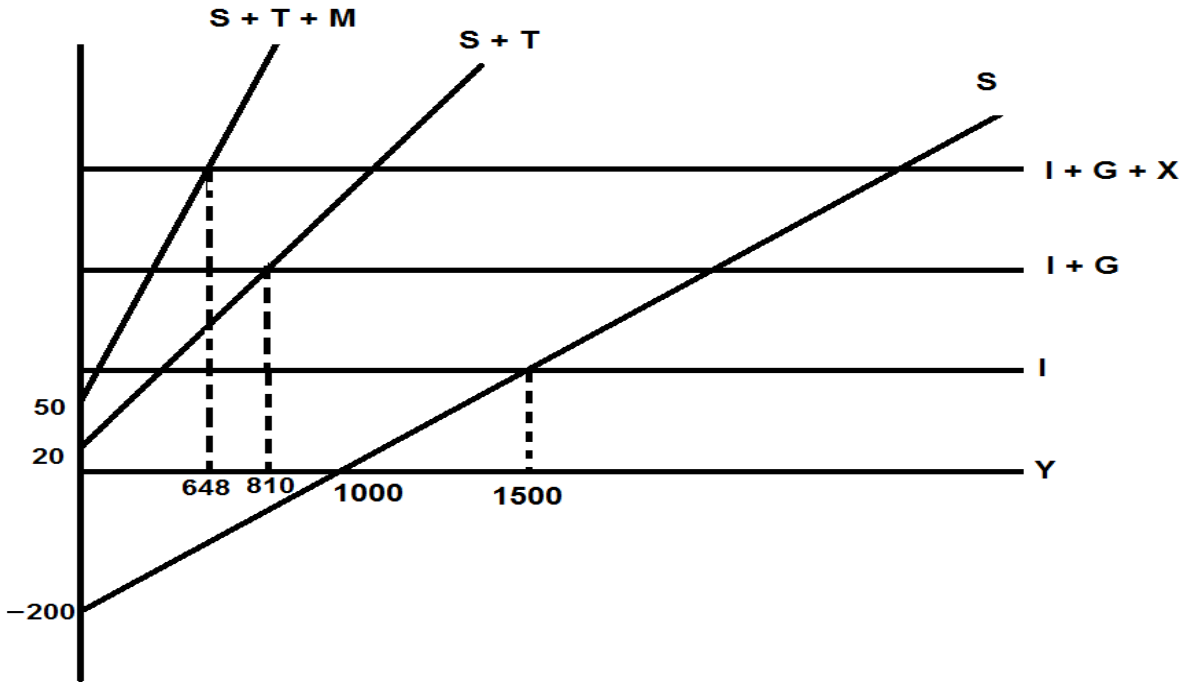
$$= 50 + 64.8 = 114.8$$

Then

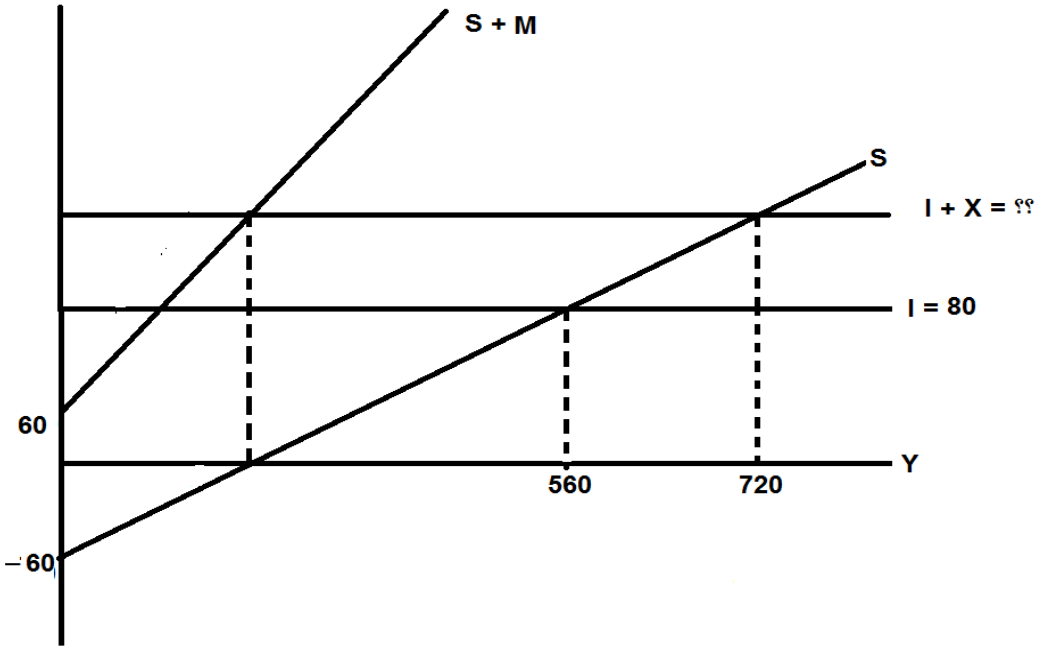
$$S + T + M \quad = \quad I + G + X$$

$$-106.8 + 182 + 114.8 \qquad 100 + 40 + 50$$

$$190 \qquad\qquad 190$$



Example



Required

1- Saving function

2- Determine the export (X)

3- Find the import function

4- Determine the foreign trade multiplier

Answer

1- We can get the saving function as follow

Saving equal investment at income equal 560 , then

$$S = -60 + sy$$

$$80 = -60 + S(560)$$

Then

$$140 = S560$$

$$S = \frac{140}{560} = 0.25$$

Then saving function

$$S = -60 + 0.25y$$

2) Export (X)

We know the saving equal zero when income equal

$$60 = 0.25y$$

$$Y = \frac{60}{0.25} = 240$$

And multiplier = $\frac{1}{5} = \frac{1}{0.25} = 4$

Then when income increase from 560 to 720 then

$$\Delta Y = 720 - 560 = 160$$

And $\frac{\Delta Y}{\Delta X} = 4$ then $\frac{160}{X} = 4$

$$4X = 160$$

$$X = 40$$

Or Saving at income equal 720

$$S = -60 + 0.25(720)$$

$$S = -60 + 180 = 120$$

But $$S = I + X$$

$$120 = 80 + 40$$

3) At income equal 240 we can achieves the import function as under

$$Y = co + cy + I + (X - M)$$

$$Y = 60 + 0.75y + 80 + (40 - 60 - my)$$

$$Y = 60 + 0.75y + 80 - 20 - my$$

$$Y - 0.75y + my = 120$$

$$Y\,(1 - 0.75 + m) = 120$$

$$Y = \frac{1}{1 - 0.75 + m}\ 120$$

Since

$$240 = \frac{1}{1 - 0.75 + m}\ 120$$

$$2 = \frac{1}{1 - 0.25 + m}$$

This implies

$$2m + 0.5 = 1$$

$$2m + 0.5$$

$$m = \frac{0.5}{2} = 0.25$$

This means the import function

$$M = 60 + 0.25y$$

Also

We Know

$$M + S = X = I$$

$$M = 60 + my$$

$$M = 60 + m\,(240)$$

In equilibrium position $M = X + I$

$$M = 120$$

Then $120 = 60 + m\,(240)$

$$60 = m\,(240)$$

$$m = \frac{60}{240} = 0.25$$

then $M = 60 + 0.25y$

Exercises

The following statements are true (T) or false (F)

1- The increased production results in more employment.

2- At any point above equilibrium, people intend to save more than firms will be willing to go on investing.

3- The values of MPC and MPS always add up to I because every $1 of the national income is either saved or used for consumption.

4- If a multiplier is 1, then consumers consume all of their income.

5- At equilibrium level, there is over production.

6- In closed economy, the tax multiplier is –MPC/1 – MPC

7- In closed economy, the investment multiplier is 1/1 –MPC

8- The multiplier can be equal zero.

9- When the government tax revenues exceed the expenditure, it has a budget deficit.

10- In equilibrium aggregate demand equals aggregate supply.

11- When aggregate demand is less than the amount produced the surplus goods will be placed in inventory.

12- An increase in income results in a proportional increase in both, savings and consumption.

13- At any point below equilibrium, the consumption being greater than current production.

14- Any change in income will cause consumption to vary in the same direction.

15- The consumption is autonomous spending.

16- At any point above equilibrium, investment surpass savings.

17- The consumption Function states that consumption is proportional to income.

18- The equilibrium level results in an excess of total spending.

19- In an economy total aggregate income is equal to total aggregate spending.

20- When government spending is increased, equilibrium income decreases.

21- The rise in the rate of interest causes a rising in planned investments.

22- Tax policy has its impact aggregate demand through its influence on consumer disposable income.

23- The initial effect of an autonomous increase in government spending is an increase in aggregate demand.

24- Government provides public goods.

25- When the deficit is financed by borrowing in the financial markets, the money supply is unchanged.

26- The reduction in investment means a reduction in aggregate demand

27- Fiscal policy is the policy of the government with regard to the level of government spending and the tax structure.

28- Under the progressive tax system, when income increases, the tax rate as well as the taxes collected increase.

29- A progressive tax structure is one in which the percentage of income collected in taxes is greater for higher incomes than for lower ones.

30- When the government levies personal, taxes the disposable personal income and personal consumption are increased.

31- All government policies have different impacts on different groups of people.

32- Government spending is a component of aggregate supply.

33- The effect of a proportional tax structure on inflations is much less than that of a progressive tax structure.

34- A regressive income tax structure is one in which the percentage of income collected in taxes is lower for higher incomes than for lower incomes.

35- Property taxes affect the wealth owned by individuals and businesses and will thereby again affect consumption and investment.

36- A proportional tax structure is one in which the percentage of income collected in taxes is the same for all levels of income.

37- In case the balanced budget is balanced, the total increase in government expenditures must higher than the total increase in taxes.

38- An increase in the taxes would reduce the purchasing power available to the public and so also reduce the primary inflationary pressure.

Chapter four

Chapter 4

Consumption Function between short and long run

Suppose you have the following information

First stage

The consumption function in the short run

$$C = 200 + 0.8Y$$

$$I = 100$$

Required

1- Determine national income (Y)

2- Determine the form and value multiplier

3- verify the economic equilibrium

4- show that by graphically

Firstly

In the short run

Answer

1) $$Y = C + I$$

$$Y = 200 + 0.8Y + 100$$

$$Y - 0.8Y = 300$$

$$Y = \left(\frac{1}{1 - 0.8}\right) \ 300$$

$$Y = 1500$$

2) The simple form of multiplier $\frac{1}{1 - C}$ and equal $\frac{1}{1 - 0.8} = \frac{1}{0.2} = 5$

3) The equilibrium

The saving function $S = -200 + 0.2Y$

Then the equilibrium condition $S = I$

This means

$$S = -200 + 0.2Y = 100$$

By substitute $Y = 1500$

$$S = -200 + 0.2\ (1500) =$$

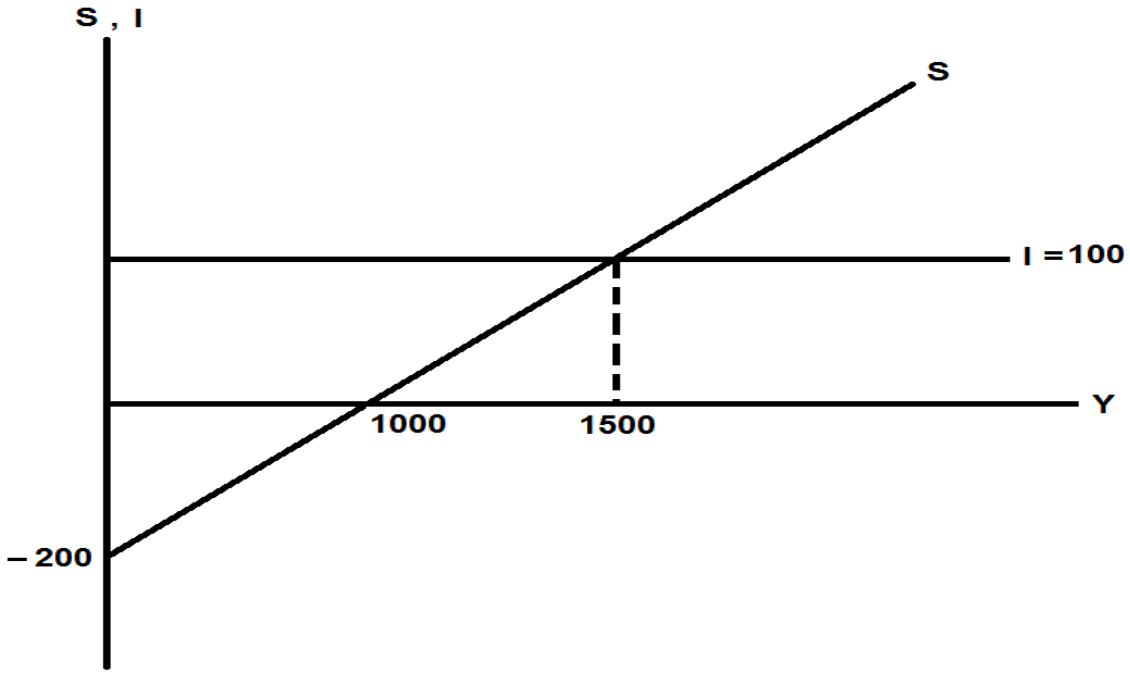
$$-\ 200 + 300 = 100$$

Then

$$S \ = \ I$$

$$100 = 100$$

4) Graphically



When saving equal Zero then

$$\text{Zero} = -200 + 0.2(Y)$$

$$200 = 0.2(Y)$$

Then

$$Y = \frac{200}{0.2} = 1000$$

Second stage

The government expenditure G = 40

The tax function T = 20 + 0.25Y

Answer

1) $$Y = C + I + G - T$$

$$Y = co + c(y - t - ty) + I + G$$

$$Y = co + cy - ct - cty + I + G$$

$$Y - cy + ct + cty = co + I + G$$

$$Y[\ 1 - c\ (1 - t)] = (co + I + G)$$

$$Y = \frac{1}{1 - c\ (1-t)}\ (co + I + G)$$

$$Y = 200 + 0.8\ (Y - 20 - 0.25Y) + 100 + 40$$

$$Y = 200 + 0.8Y - 16 - 0.8\ (0.25)Y + 100 + 40$$

$$Y - 0.8Y + 0.8(0.25)Y = 200 + 100 + 40 - 16$$

$$Y\ [1 - 0.8(1 - 0.25)] = 324$$

$$Y = \frac{1}{1 - 0.8\ (1-0.25)}\ \ 324$$

$$Y = \frac{1}{1 - 0.6}\ \ 324 = 2.5(324) = 810$$

2) The form of multiplier $\dfrac{1}{1 - c\ (1-t)}$

The value $\dfrac{1}{1 - 0.8\ (1-0.75)} = \dfrac{1}{1 - 0.6} = \dfrac{1}{0.4} = 2.5$

3) Verify the equilibrium

$$S + T = I + G$$

$$S = -200 + 0.2\,(Y - 20 - 0.25Y)$$

$$S = -200 + 0.2\,[810 - 20 - 0.25\,(810)]$$

$$S = -200 + 162 - 4 - 40.5$$

$$S = -244.5 + 162 = -82.5$$

$$T = 20 + 0.25(810) =$$

$$20 + 202.5 = 222.5$$

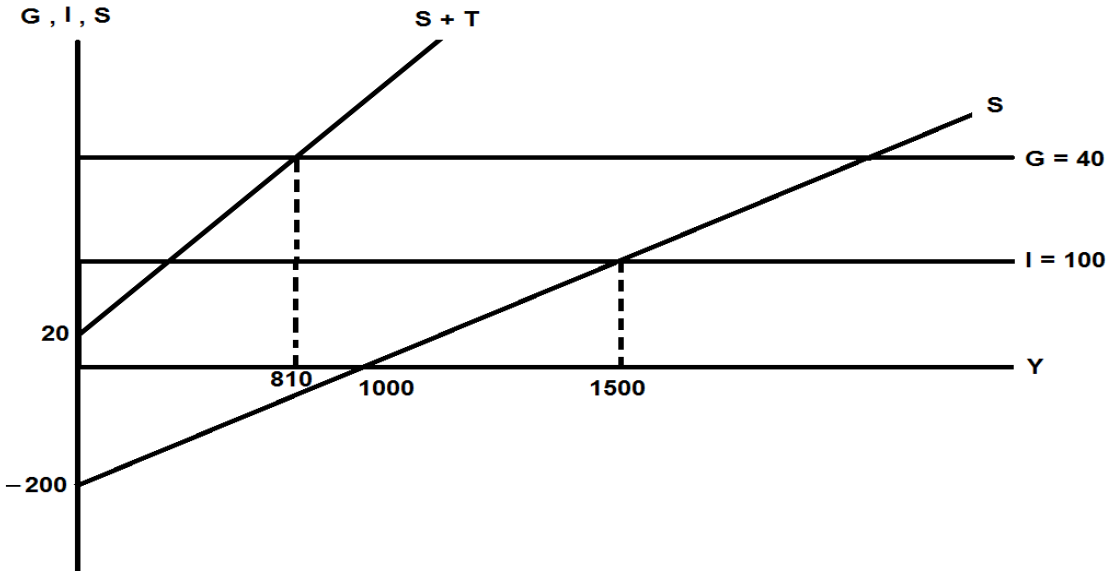
Then

$$S + T = I + G$$

$$-82.5 + 222.5 = 100 + 40$$

$$140 = 140$$

(4)



Third stage

1) $Y = C + I + G - T + (X - M)$

$$Y = 200 + 0.8\ (Y - 20 - 0.25Y) + 100 + 40 + (50 - 50 - 0.1Y)$$

$$Y = 200 + 0.8Y - 16 - 0.8\ (0.25)Y + 100 + 40 - 0.1Y$$

$$Y - 0.8Y + 0.8(0.25)Y + 0.1Y = 324$$

$$Y(1 - 0.8\ (1 - 0.25) + 0.1) = 324$$

$$Y = \frac{1}{1 - 0.6 + 0.1}\ (324)$$

$$Y = \frac{1}{0.4 + 0.1}\ (324) = \frac{1}{0.5}\ (324)$$

$$Y = 2\ (324) = 648$$

2) The multiplier from $\frac{1}{1 - c\ (1-t) + m}$

The value of multiplier $= \frac{1}{1 - 0.8\ (1 - 0.25) + 0.1} = \frac{1}{1 - 0.6 + 0.1}$

$$= \frac{1}{1 - 0.4 + 0.1} = \frac{1}{0.5} = 2$$

3) Verify equilibrium

$$S + T + M = I + G + M$$

$$S = -200 + 0.2\ [648 - 20 - 0.2\ (0.25)\ 648]$$

$$= -200 + 129.6 - 4 - 32.4 = -106.8$$

$$T = 20 + 0.25\ (648) =$$

$$20 + 162 = 182$$

$$M = 50 + 0.1(648) =$$

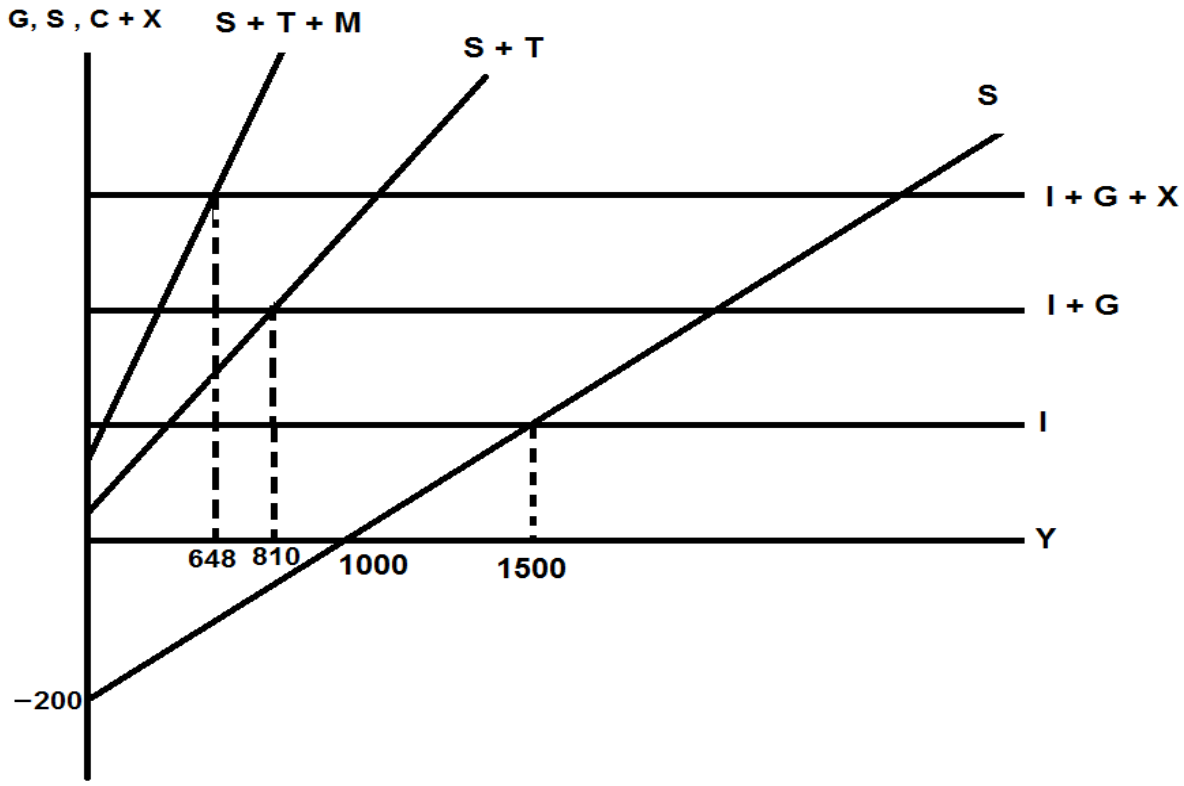
$$50 + 64.8 = 114.8$$

Then

$$S + T + M = I + G + X$$

$$-106 + 182 + 114.8 = 100 + 40 + 50$$

$$190 = 190$$



Secondly

In the long run

In the long run the consumption function transform to the following form

$$C = 0.8Y$$

Then

The first stage

1) $$Y = C + I$$

$$Y = 0.8 + 100$$

$$Y - 0.8Y = 100$$

$$Y\,(1 - 0.8) = 100$$

$$Y = \frac{1}{1 - 0.8}\,100$$

$$Y = 5 \times 100 = 500$$

2) Then the form and value of multiplier don't change

3) The equilibrium

Then the saving function transform to $S = 0.25Y$

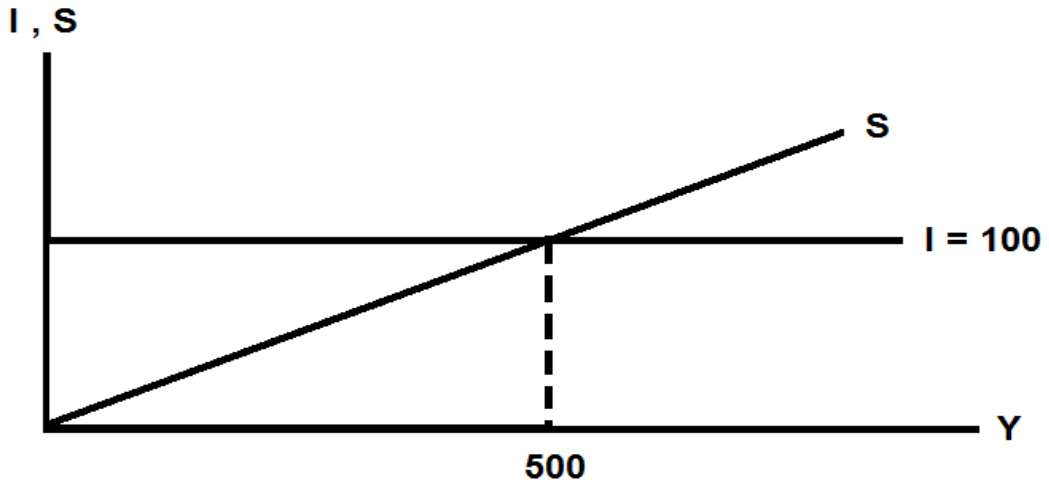
Then the equilibrium condition is

$$S = I$$

$$S = 0.2\,(500) = 100$$

$$S = I$$

$$100 = 100$$



Second stage

1) $$Y = 0.8\,(Y - 20 - 0.25Y) + 100 + 40$$

$$Y = 0.8Y - 16 - 0.8\,(0.25)Y + 100 + 40$$

$$Y - 0.8Y + 0.8\,(0.25Y) = -16 + 100 + 40$$

$$Y\,(1 - 0.8(1 - 0.25) = 124$$

$$Y = \frac{1}{1 - 0.6} = 124$$

$$Y = 2.5(124) = 310$$

2) Then the form and value of multiplier don't change

3) Verify the equilibrium

$$S + T = I + G$$

$$S = S\,(y - t - ty)$$

$$S = 0.2\,(y - 20 - 0.25y)$$

$$S = 0.2(310 - 20 - 0.2\,(0.25)(310)$$

$$= 62 - 4 - 15.5 = 42.5$$

$$T = 20 + 0.25\,(310) =$$

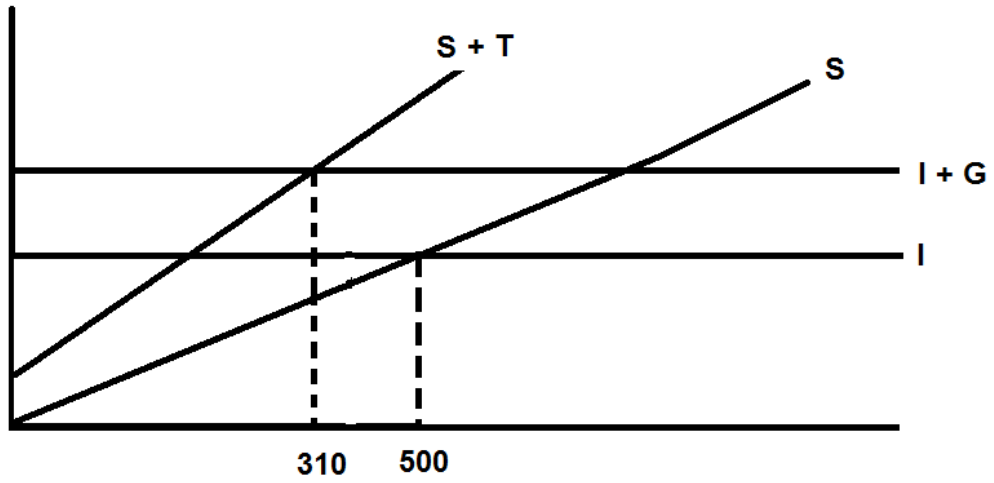
$$20 + 77.5 = 97.5$$

Then

$$S + T \;=\; I + G$$

$$42.5 + 97.5 = 100 + 40$$

$$140 \;=\; 140$$



Exercises

The following statements are true (T) or false (F)

1- The net taxes are the sum of the government transfer payments and the taxes

2- Government spending on goods and services will be treated as endogenous.

3- The tasks cannot affect exogenous consumption.

4- The equilibrium in the goods market means that desired purchases of total output (GNP) equal the quantity of GNP produced.

5- The investment has both planned and unplanned components.

6- The endogenous consumption is measured as the amount consumed when GNP equals zero.

7- The saving function is the relationship between the level of saving and total real income holding everything else constant.

8- Endogenous consumption, as defined, depends on the level of disposable income, which in turn depends on total income, or GNP.

9- Equilibrium real GNP occurs where planned aggregate expenditure equals planned aggregate production

10- The consumption function is a relationship between the variable consumption and another set of variable that determine how much households desires to consume in any given year.

11- Total planned expenditure on domestic goods and services equals the sum of planned consumption, planned investment, government expenditure, net exports

12- When the consumption function cross the 45o line, planned consumption is exactly equal to GNP

13- At equilibrium firms are able to sell all they had planned and buyers are able to buy what they planned.

14- Firms "draw down" on their inventories when their sales exceed what they had anticipated.

15- Equilibrium real GNP occurs where the 45o line intersects the planned aggregate expenditure line.

16- When GNP is larger than planned consumption plus taxes, planned saving is negative.

17- The MPC is greater than 0 and less than 1.

18- Variables other that a change in GNP will change exogenous consumption.

19- The MPC is constant.

20- The part of consumption that depends on household income is called exogenous consumption.

21- The net exports are negative when exporters are selling more to foreigners than foreign exporters are selling to us

22- When planned consumption plus net taxes equals GNP, planned saving must be zero.

23- The MPC is the slope of the consumption function line.

24- The planned saving is GNP minus net taxes minus planned consumption

25- The saving function as a straight line with a slope equal to the marginal propensity to save.

26- The consumption function has two components: the marginal propensity to consume and the change in planned consumption for every dollar change in disposable income.

27- The net exports are positive when importers are purchasing more from abroad than our exporters are selling.

28- A change in GNP (national income) will change disposable income and endogenous consumption.

29- The single most important determinant of the level of consumption is size of disposable income.

30- The part of consumption that depends on factors other than income and GNP is determined outside the circular flow is called endogenous consumption.

31- When any of factors held constant change, the consumption function line will shift in parallel fashion.

32- When GNP is less than planned consumption plus taxes. Planned saving is positive.

33- The MPS is equal to the slope of the saving function.

34- The saving is defined as the portion of household's disposable incomes that is not consumed.

35- The 45o line plots out all the points where whatever is measured along the vertical axis equals what is measured along the horizontal axis.

36- The marginal propensity to save is change in consumption and a change in income.

37- When the government reduces taxes on business profits, planned investment will increase.

38- When the government transfer payment exceeds tax, the net tax is negative.

39- Funds that a firm uses to finance a new building could have been deposited in a savings account or lent to others at the prevailing interest rate.

40- The disposable income is the amount households have left over after paying their taxes.

41- Disposable income is total income minus taxes.

42- The slope of the consumption function is more than the slope of the 45^o line.

43- When production of GNP increases by 41, planned consumption and planned total expenditure both increase by more than $1.

44- The exogenous consumption is positive in the short run.

45- The net export is exogenous variable.

6- The MPC represents the change in consumption that occurs when consumers receive (or lose) an additional dollar of disposable income.

47- The higher interest rates encourage greater investment.

48- When the government transfer payment exceeds tax, the net tax is positive.

49- Firms build up their inventories unexpectedly when sales fall short.

50- The disposable personal income includes government transfer payments.

51- The income left over after paying taxes is called disposable income.

52- The 45^o line indicates the points at which what is measured along the vertical axis equals what is measured along the horizontal axis.

53- Dissaving occurs when people spend a greater amount than their disposable income.

54- The marginal propensity to save is equal to the change in saving divided by the change in disposable income.

55- The slope of the saving function is the marginal propensity to consume.

56- The saving is the residual after taxes and consumption are removed from total income.

57- The relationship between the total planned consumption and total income is the saving function.

58- The disposable income can be consumed or saved.

59- The equilibrium occurs when planned aggregate expenditures are equal to planned aggregate production.

60- The dissaving is positive saving.

61- The increased production results in more employment.

62- At any point above equilibrium, people intend to save more than firms will be willing to go on investing.

63- The Values of MPC and MPS always add up to I because every $1 of the national income is either saved or used for consumption.

64- The planned saving and taxes are planned injections.

65- If a multiplier is 1, then consumers consume all of their income

66- At equilibrium level, there is over production.

67- The equilibrium level of output whose production will actually create total spending just sufficient to purchase that output.

68- The multiplier theory is the determination of the equilibrium level of income and output.

69- At any point above equilibrium, firms will cut production and lay off workers

70- In closed economy, the tax multiplier is -MPC / 1- MPC

71- The planned investments and government expenditures are planned withdrawals from the income-expenditure flows.

72- The equilibrium level result in piling up of unsold goods and therefore cutbacks in the rate of production.

73- The multiplier effect refers to the fact that changes in autonomous factors cause changes in the equilibrium level of income that are a multiple of the change in spending.

74- The level of income and output that can continue to be produced assuming non unexpected changes in the economy.

75- In closed economy, the investment multiplier is 1 / 1-MPC.

76- The multiplier can be equal zero.

77- When the government tax revenues exceed the expenditures, it has a budget deficit.

78- In equilibrium aggregate demand equals aggregate supply.

79- When aggregate demand is less than the amount produced the surplus goods will be placed in inventory.

80- The open economy is equal to the of (planned) consumption and (planned) investment.

81- The Multiplier Principle States that an initial change in the rate of spending will cause a chain reaction.

82- At any point below equilibrium, businesses will find inventories depleting and will then expand production and hire more men.

83- An increase in income carries a proportional increase in both, savings and consumption.

84- At any point below equilibrium, the consumption being greater than current production.

85- The equilibrium level draws down inventories and prompts increase in the rate of production.

86- Equilibrium can be defined as the level of income where total spending is just sufficient to purchase all the goods produced.

87- Any change in income will cause consumption to vary in the same direction.

88- The consumption is autonomous spending.

89- Increase in the aggregate level of national income in the economy will induce higher levels of desired savings and desired investment.

90- At any point above equilibrium, investment surpass savings.

91- The consumption function, states that consumption is proportional to income.

92- The equilibrium level results in an excess of total spending.

93- In an economy total aggregate income is equal to total aggregate spending.

94- The IS-schedule is the collection of points in the interest rate-income plane that represent equilibrium in the commodity market.

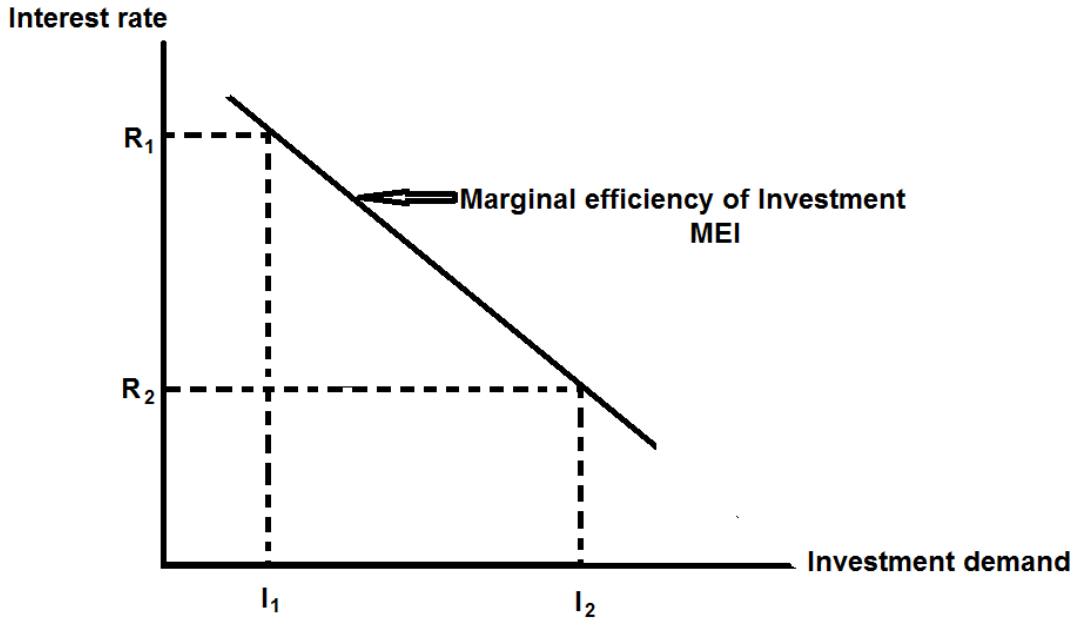
95- The investment is induced spending.

Chapter Five

Chapter 5

Investment and Income level

There are negative relation between investment decision and interest rate, then the movement on the investment demand curve to downward, this means increase investment and reduce the interest rate, If the interest rate rising the demand investment decrease.



But there are many factors which effect to investment demand and lead to shift the marginal efficiency of capital to right or to left from this factor the income level. The change in income effect to dependent investment.

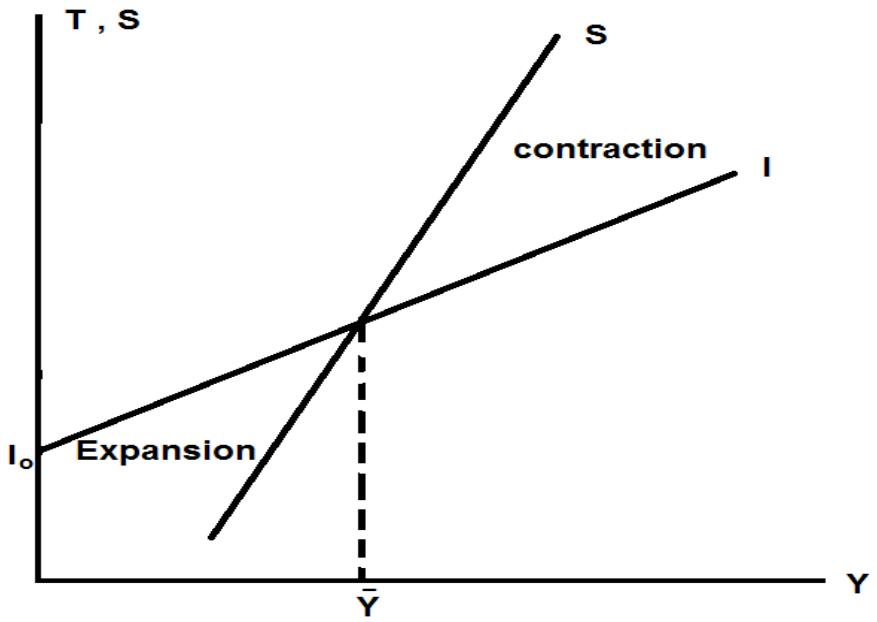
Then we have independent investment (Exogenous) and dependent investment (endogenous). This means the gross investment divides into

two parts: endogenous (dependent) investment and exogenous investment and exogenous investment (independent) investment (independent).

Then there is relationship between income and investment which we can call the investment function which can write this function as follow

$$I = I_o + iY \qquad (1)$$

Where I is gross investment whereas iY is endogenous investment or (dependent investment) which equal the marginal propensity to investment (i) multiplied in income level (Y) and in this case the equilibrium condition which respect to equal planned investment and planned saving achieves when saving function and investment function intersection. We can show that as follow.



Above diagram showing equilibrium income determined when saving function intersect the investment function $(\overline{Y})$ and in this case any increase in exogenous (Independent) investment means shit upward paralleled for investment function result increase in the equilibrium income such increase (or change) in exogenous investment multiplied in multiplier value.

Notice in this case the multiplier not simple but compound of (complex) multiplier because there is independent investment and subsequently the multiplier not equal simple multiplier which equal $\frac{1}{5}$ but equal $\frac{1}{S-i}$ or one divided by the difference between marginal propensity to save subtract marginal propensity to investment.

The above analysis suppose the current investment depend on the current income, but many firms need long time to control the information and planning before taking expansion investment decision this means leads to long period between income change and related investment change, this implies

$$I_t = I_o + iY_{t-1} \qquad (2)$$

or

$$I_t = I_o + i(Y_{t-1} - Y_{t-2}) \qquad (3)$$

Many studies indicate to that the last change in income level effects on the current investment; this theory is called Acceleration Principle.

Acceleration Principle

Clark explain that the accelerator is change in investment proportionate with change in income or (consumption)

Suppose the firm produce the good (X), suppose also this firm have 100 machine to produce good (X) and productive lifetime for each machine 10 years.

- The production Capacity for each machine 100 unit every year.

- The gross demand on the good X in the current year 10000 unit

Suppose the gross demand on good X increase, what is effect to demand investment, we can present the following schedule.

year	Gross demand for good X	Investment for replacement	New investment to face the increase demand	Total
Zero	10000	10	__	10
1	11000	10	10	20
2	12000	10	10	20
3	12500	10	5	15
4	12500	10	___	10

Suppose increase demand for X good by %10 from 1000 to 11000, in this case the firm need to purchase 10 new machines and then the total demand for machines increase in the first year to 20 machines. This means increase by %10 in consumption (10000 – 11000) leads to increase in demand investment by %100.

Suppose also the demand on X good increase in the second year by 1000 unit to reach 12000 as result the demand for machine will increase by 10 machines plus to 10 machines as replacement. Suppose the X demand increase by 1000 unit yearly the firm not needs to decrease the production capacity.

Suppose the X demand increase by 500 units only in the third year this means the machine demand decrease from 10 to 5 only (new 5 machines plus 10 machines for replacement). This means the machine demand decreasing although the demand on X good still increase (from 1200 to 12500)

Suppose the gross demand on X good is constant in the fourth year subsequently the firm not need to additional machine and the productive capacity for the machine industry produce 10 only machine to meet the replacement investment.

This means the primary increase on the X good lead to more proportional increase for machine demand to be this machine demand constant, we need to increase continual for the X good demand, if the demand on X good become constant then the machine demand will

decrease, but if the X good demand decrease the machine demand is annulment.

We can show that by the following equation

$$M = m\ (X_t - X_{t-1}) + R$$

Where M_t the number of new machine which firm demand it at t year $X_t - X_{t-1}$ the consumption demand on X good at t and t_{-1} year and R indicate the replacement investment, finally m indicate the number of machine which the firm need to produce one only unit from X good.

If the prevailing production function fixed proportionated, this means no substitute between production factors. This case lead to the accelerator depend on rate of change in aggregate demand and not rate of change in consumption only.

We can express for aggregate variables in above equations by monetary from- or by using prices, the value of aggregate demand by monetary expression equal national income at equilibrium situation – this means the investment in t year is

$$I_t = V\ (Y_t - Y_{t-1}) + R$$

We can substitute V (which explain the value number of machines which can to produce one only dollar from the production within year in example the value of m in last schedule $\frac{1}{100}$ If the machine price 300 dollar and price for one only unit of production is one only dollar then

the V value is $\frac{300}{100} = 3$, this percentage (or ratio) is called capital – production coefficient or accelerator principle.

Notice the value of accelerator not depend only at productive capacity for machines but also depend on the long period measuring production the accelerator value in the last example equal 3 because the long period to measuring production complete year.

If the long period only six months this means rising the accelerator value, If the production equal 50 then the accelerator value equal $\frac{300}{50} = 6$ and soon.

Whereas I_t in above equation indicate the gross investment and to compute the net investment, we would subtract the replacement investment from two sides of equation, when subtract the replacement investment (Depreciation) we can get to

$$nI_t = V\ (Y_t - Y_{t-1})$$

Where nI_t indicate to net investment.

Exercises

1- Suppose that the demand for investment is given by

$$I = 0.2\ (K^* - K_{-1})$$

Where K^* is the desired stock of capital given by

$$K^* = 0.01\ (Y/R)$$

Where Y is output and R is the interest rate, assume that there is no depreciation

Require

(a) Calculate the desired capital stock in year 1, if output \$2000 and the interest rate is 0.05 (5 percent)

(b) What is the level of investment in year 1 if the capital stock in year 0 was \$200

(c) Assume that output and interest rate are constant what is investment in years 2 and 3 and all subsequent years?

2- Answer above problem if the interest rate is 0.10 (10 percent)

3- Suppose that the demand for investment is given by

$$I = 0.5\ (K^* - K_{-1})$$

Where K^* is desired stock of capital given by

$$K^* = 0.025(Y/R)$$

Where Y is output and R is the interest rate. Assume that there is no depreciation

(a) Calculate the desired capital stock in year 1, if output $\$2000$ and the interest rate is 0.05 (5 percent)

(b) What is the level of investment in year 1 if the capital stock in year 0 was $\$200$

(c) Assume that output and interest rate are constant what is investment in years 2 and 3 and all subsequent years?

Chapter Six

Chapter 6

The Accelerator

Explain the acceleration principle

The acceleration principle asserts a direct relationship between changes in sales and net business investment, if sales are steady business will see no need for additions to their productive capacity .i,e., net investment, so the only business investment will be replacement investment to offset depreciation. This investment can be assumed to be fairly steady. If sales rise rapidly, however, say by 50 percent, net business investment will increase even more rapidly, instead of replacing 10 percent, but also increase capacity by 50 percent. This means gross business investment has increased over its old level by a multiple of 6 (10 percent of machines, at the old level, as compared to 10 percent + 50 percent = 60 percent of machines at the new level).

As an example, suppose a firm must have $2 of equipment to produce $1 of output per year. This means that for yearly sales of $30 million, the firm needs to have a capital stock of $50 million, if the $30 million sales figure has been steady for a few years, the firm will have built up its capital stock to the $60 million level and will need only to offset depreciation, if the firm's capital stock consists of 20 machines of different ages, with one wearing out each year depreciation costs will be $3 million per year, a figure arrived at by dividing the $60 million of capital stock by the number of machines which comprise that capital stock, 20 in this case. $60 million ÷ 20 = $3 million, or the cost of one

machine which is replaced each year. This means that the firm's gross investment is $3 million per year while its net investment is Zero. The following table shows the stable investment over the year as sales remain stable

year	sales	Capital stock	Net investment	Gross investment
2011	$30	$60	0	1 machine at $3 =$3
2012	$30	$60	0	1 machine at $3 =$3
2013	$30	$60	0	1 machine at $3 =$3

However, if sales increase by 50 percent (to $45 million) in 2014, investment will increase at a higher rate, with sales of $45 million, the firm must increase its capital stock to $90 million. This requires a net investment of $30 million ($90 million − $60 million = $30 million). This will increase the number of machines by 10, increasing the firm's output capacity by 50 percent (the same increase as sales).

year	sales	Capital stock	Net investment	Gross investment
2014	45	$90	$30	(10 + 1) machine at $3 =$33
2015	60	$120	30	(10 + 1) machine at $3 =$33
2016	75	$150	30	(10 + 1) machine at $3 =$33

In calculating gross investment, it must be remembered that the firm will still have to replace one aging machine a year, this gives us a gross investment of 11 machines, or $33 million, An increase in sales of 50 percent in this case increase gross investment by a multiple of 11. Notice in above table that if sales continue to increase by $15 million dollars per year, gross investment will hold steady at $33million per year.

If sales stop increasing and hold steady, a different picture emerges instead of investment remaining steady, net investment will drop to Zero. Without any increase in sales, there is no need to expand capacity, see the following table.

year	sales	Capital stock	Net investment	Gross investment
2011	$30	$60	$0	1 machine at $3 = $3
2012	30	60	0	1 machine at $3 = $3
2013	30	60	0	1 machine at $3 = $3
2014	45	90	30	(10 + 1) machine at $3 = $33
2015	60	120	30	(10 + 1) machine at $3 = $33
2016	75	150	30	(10 + 1) machine at $3 = $33
2017	75	150	0	1 machine at $3 = $3
2018	75	150	0	1 machine at $3 = $3

The importance of the acceleration principle is that it shows that investment fluctuates much more than sales fluctuate. Minor changes in sales can trigger larger changes in investment. This is because the level of gross investment depends on the level of sales.

How does the acceleration principle affect the business cycled the acceleration principle can be a powerful factor in the instabilities of the business cycle. The increase in investment stimulated by an increase in demand can through the effects of the multiplier, dramatically increase economic growth so, minor increase in demand can through the effects of the multiplier dramatically increase economic growth, so minor increase in demand can stimulate the economy powerfully through the interactions of the multiplier and the accelerator "new investment".

The economy, however cannot expand forever, eventually the full-employment level of income and output will be reached, once this level is reached, the accelerator will then force the economy away from full-employment, the economy will not be able to maintain a steady full-employment output. This is because once demand stops increasing net investment will fall to zero. This drop in investment will reduce output, and will lead to further decreases in income and output due multiplier effects, when the demand for goods drops, the acceleration principle works in revers, firms will try to get rid of the machinery that they no longer need. They will not only refuse to replace obsolete worn-out equipment they will even try to get rid of machinery faster than depreciation would allow for. This is because part of the stock of machinery will be superfluous, and places an extra burden in

depreciation and maintenance expenses on the earning capacity of the firms, which are confronted with a reduction in sales revenues. The overall effect is that once the economy reaches full employment and demand stops growing the accelerator and the multiplier will combine to immediately propel the economy into recession. The negative gross investments of firms will, through the multiplier, feed upon itself and further reduce demand, which is turn will cause firms to try to "disinvest" even more (as happened during the depression).

The economy will eventually bottom out because firms cannot disinvest all their capital. Though they can run down inventories (a form of negative investment). They cannot reconvert machines back into resources. The depreciation rate places a limit on the rate of disinvestment. As disinvestment slows down, the drops in demand will become smaller and smaller. At some point, firms will have the level of capital stock needed for low level of income. So, disinvestment will stop another increase in demand will occur, and the next business cycle will start.

The acceleration principle, then, is an explanation of the instability in the capitalist economy. It can exaggerate and intensify any fluctuations in the economy caused by other factors.

Suppose that the amount that people consume is equal to 80% of their disposable income of the preceding year, and autonomous consumption is $\$200$ billion. Net investment equals the addition to the capital stock of the preceding period. The capital stock in any year is

always equal to 2.5 times the level of the same year's consumption, what is the equilibrium in the economy? How would the economy behave if it is confronted by a sudden drop in aggregate income of $\$50$ billion?

Answer

First construct the multiplier model; second, the accelerator model; and finally the combined accelerator-multiplier model which will be used to calculate equilibrium income, and the consequences of the exogenous "stock" of the drop in national income.

Autonomous consumption $\bar{C} = 200$ and people consume in addition 80% of their preceding year's income. Thus the consumption function can be represented by:

$$C_t = 200 + 0.8\, Y_{t-1} \qquad (1)$$

Where subscripts t and t-1 indicate year t and year t-1 (the preceding year). The income identity stock that income equals the sum of consumption and investment:

$$Y_t = C_t + I_t \qquad (2)$$

Substituting equation (1) into equation (2) yields

$$\mathrm{Y_t} = 0.8\, \mathrm{Y_{t-1}} + 200 + \mathrm{I_t} \qquad (3)$$

This represents the multiplier model of income determination. As regards the accelerator-model, First, net investment equals the addition to the capital stock of the preceding period, so

$$I_t = K_t - K_{t-1} \qquad (4)$$

Second, the capital stock is 2.5 times the consumption sales:

$$K_t = 2.5C_t \qquad (5)$$

Substitute equation (5) into equation (4) gives the accelerator relationship between investments and the increase in consumption sales:

$$I_t = 2.5C_t - 2.5\,C_{t-1} = 2.5\,(C_t - C_{t-1}) \qquad (6)$$

Substituting the consumption function (equation 1) into equation (6) gives

$$I_t = 2.5\,(200 + 0.8Y_{t-1}) - (200 + 0.8Y_{t-1})$$

$$= 2.5(0.80)\,[Y_{t-1} - Y_{t-2}]$$

$$= 2\,(Y_{t-1} - Y_{t-2})$$

This is the accelerator model

Now combine both models, substitute the accelerator, equation (7) into the multiplier equation, equation (3). This gives

$$Y_t = 0.8Y_{t-1} + 200 + 2\,[Y_{t-1} - Y_{t-2}]$$

$$= 0.8Y_{t-1} + 200 + 2\,Y_{t-1} - 2Y_{t-2}$$

$$= 2.8Y_{t-1} - 2.0Y_{t-2} + 200 \qquad (8)$$

This is the combined accelerator- multiplier model of the economy. Equilibrium prevails when the income in the present period is equal to the income of the preceding period; thus when $Y_t = Y_{t-1} = Y_{t-2} = \bar{Y}$ a constant, when this unknown equilibrium condition is imposed onto equation (8) equilibrium $\bar{Y}$ can be determined:

$$\bar{Y} = 2.8\bar{Y} - 2.0\bar{Y} + 200$$

$$\bar{Y} = 0.8\bar{Y} + 200$$

Collecting all terms gives

$$\bar{Y} - 0.8\bar{Y} = 200$$

$$0.2\bar{Y} = 200$$

Thus the equilibrium income level is

$$\bar{Y} = \frac{200}{0.2} = 1000$$

Now use the combined accelerator-multiplier model to calculate its behavior when the economy is confronted by a sudden drop in income of $\$50$ billion. Suppose the economy is initially in equilibrium, so $Y_0 = 1000$, when the stock occurs, $Y_1 = 1000 - 50 = 950$ with the help of equation, we can calculate the income level for period 2

$$Y_2 = 2.8Y_1 - 2.0Y_0 + 200$$

$$Y_2 = 2.8(950) - 2.0(1000) + 200$$

$$Y_2 = 2660 - 2000 + 200 = 860$$

A very drastic drop in national income in the third period,

$$Y_3 = 2.8Y_2 - 2.0Y_1 + 200$$

$$Y_3 = 2.8(860) - 2.0(950) + 200 =$$

$$Y_3 = 2408 - 1900 + 200 = 708$$

Then, we can calculate Y_4 where

$$Y_4 = 2.8(Y_3) - 2Y_2 + 200$$

$$Y_4 = 2.8(708) - 2\ (860) + 200 =$$

$$1982.4 - 1720 + 200 =$$

$$262.4 + 200 = 462.4$$

And

$$Y_5 = 2.8(Y_4) - 2(Y_3) + 200$$

$$Y_5 = 2.8(462.4) - 2\ (708) + 200 =$$

$$1294.72 - 1416 + 200 = 78.72$$

Using this procedure, the values of national income over several years have been calculated. As shown in the table, to show the fore of the combined effect of the accelerator and consumption interaction.

year	0	1	2	3	4	5
Y_t	1000	950	860	708	462.2	78.72

The drop is $ 50 billion in the first period plunges the economy into an ever worsening recession.

Chapter Seven

Chapter 7

Fiscal policy and Taxation

Government can apply various measures to fight inflations; one of the available measures is a structural change in the tax system. Explain how a progressive tax structure, a proportional tax structure, and a regressive tax structure respectively affect inflation, Assume that incomes are gradually increasing.

First, what is meant by progressive, proportional and regressive tax structures will be explained, and then the effect on inflation will be analyzed.

A progressive tax structure is one in which the percentage of income collected in taxes is greater for higher income than for lower ones.

A proportional tax structure is one in which the percentage of income collected in taxes is the same for all levels of income.

A regressive income tax structure is one in which the percentage of income collected in taxes is lower for higher incomes than for lower incomes.

The effect of a progressive tax structure when incomes are rising is to reduce inflationary pressure, because an increasing percentage of incomes is collected and therefore is not available to add to demand it terms of fiscal policy, this means that government tax revenues

automatically increase more rapidly, closing the budget deficit and thereby lessening the inflationary pressure also.

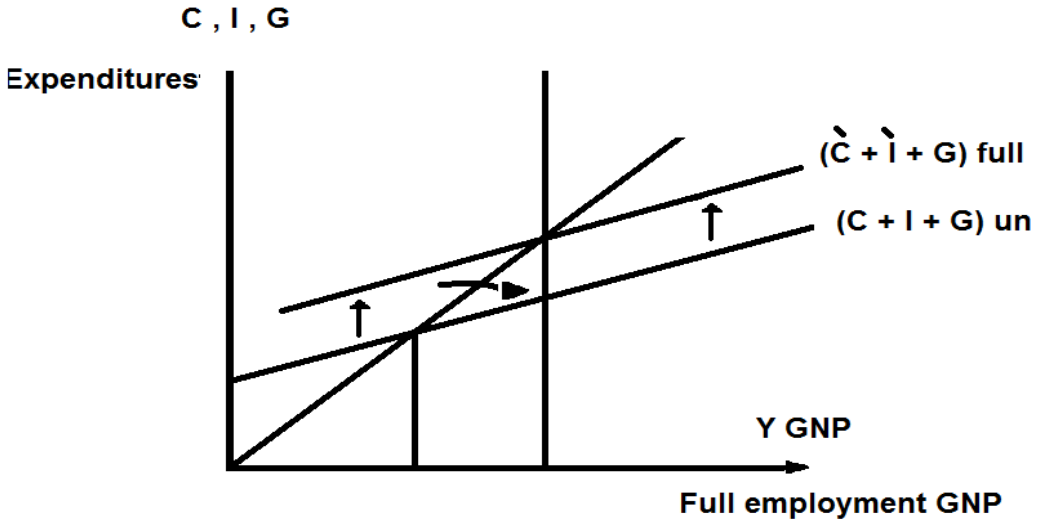
The effect of a proportional tax structure on inflation is much less than that of a progressive tax structure, because the percentage taken from rising income remains the same, still because the total tax revenue increases, the budget deficit slowly closes when income rise, assuming that the government expenditure remain unaltered. This automatic stabilizer effect helps to reduce the inflationary pressure too, but less than the progressive tax structure.

The regressive tax structure adds to inflationary pressure because a greater percentage of income will be left available to consumer when incomes rise, and hence more can be consumed, when incomes rise it depends on the tax revenue will be received by the government, and thus whether an existing budget deficit will be closed or widened. A widening deficit will add more inflationary pressure. But even if the deficit will gradually be closed under a regressive structure with rising incomes; it can still be said that the effect will be much less than it would be under a progressive or proportional tax structure.

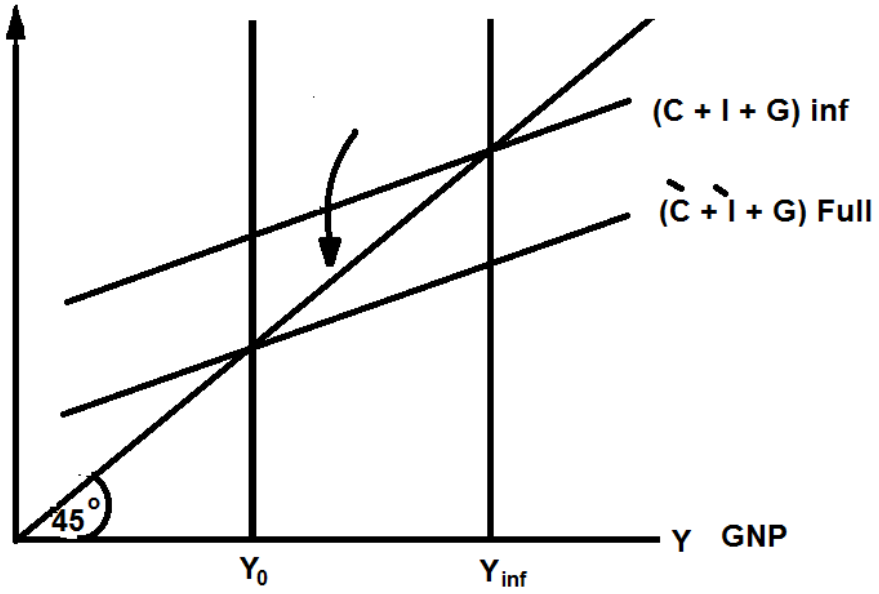
How can taxes be used to achieve the economic goals of full employment, price stability, and economic growth?

When the government levies personal income taxes T_P the disposable personal income Y − T_P decreased and thereby personal consumption expenditures are decreased also when the government levies corporation income taxes T_C , it influences investment out of

retained earnings of business, I. when retail sales taxes are also levied, the spending power of the consumers, the sales revenues and thus the retained earnings and investment are affected property taxes affect the wealth owned by individuals and business and will thereby again affect consumption and investment, by cloning the tax rates and / or the structure of the tax system (I, E. proportional versus lump- sum taxes) the government i.e., federal state and local authorities can influence the aggregate demand, particularly the consumption expenditure C and the planned investment I.



In figure 1, it can be seen that if the aggregate demand, consumption plus investment plus government spending (C + I + G), is lower than the potential output capacity of the economy, unemployment results to reach the goal of full employment, expenditures should be increased. One method is lowering the taxes to increase C and I . $Y_o - Y_u$ is the deflationary unemployment gap in GNP.



The opposite situation exists if the aggregate demand is higher than the potential output capacity: the excess purchasing power results in inflation because real output is fixed at Y_o ,and only nominal income y = P.$\bar{Y}$ can be increased by raising general price level P.

(See figure 2) $Y_{inf} - Y_o$ is the inflationary gap in GNP, An increase in the taxes would reduce the purchasing power available to the public, and so also reduce the primary inflationary pressure. To see some of the contentions above in detail the impact of the taxes on consumption expenditures and planned investments will be discussed consumption can be thought of as being dependent on income Y, taxes T, and wealth owned A;

$$C = f(Y, T, A)$$

For simplicity, assume the following Linear function form

$$C = c_1\ (1 - t_1)Y + c_2\ (1 - t_2)A \qquad (1)$$

Where

C = consumption expenditure

c_1= marginal propensity to consume out of income owned say $c_1 = 0.8$

c_2 = marginal propensity to consume out of wealth owned say $c_2 = 0.1$

t_1= personal income tax rate

t_2 = personal property tax rate

Investment can be thought of as being dependent on the interest rate r, taxes T, and earning after income taxes R then

$$I = f(r, T, R)$$

For simplicity, assume the following linear functional form

$$I = \propto r + \beta(1 - t_3)\, R \qquad (2)$$

Where

I = planned investments

r = interest rate (= opportunity cost capital)

t_3 = corporation income tax rate

$\propto$ = reaction coefficient of investments to the interest rate

β = reaction coefficient of investments to the earnings after taxes

Total aggregate demand consists of consumption, planned investments and government expenditures.

$$Y = C + I + \bar{G} \qquad (3)$$

Subtitling equations (1) and (2) into equation (3) yields

$$Y = c_1\ (1 - t_1)Y + c_2\ (1 - t_2)\ A + \propto r + \beta\ (I - t_3)\ R + \bar{G}$$

Brining all the terms which Y to the left hand side gives

$$Y = c_1 y - c_1 t_{1y} + c_2\ (1 - t_2)\ A + \propto r + \beta\ (I - t_3)\ R + \bar{G}$$

$$Y - c_1 y + c_1 t_{1y} = c_2\ (1 - t_2)\ A + \propto r + \beta\ (I - t_3)\ R + \bar{G}$$

$$Y\ [(1 - c)(1 - ct_1)] = c_2\ (1 - t_2)\ A + \propto r + \beta\ (I - t_3)\ R + \bar{G}$$

Dividing both sides by the coefficient between square brackets $[1 - c_1\ (1 - t_1)]$ gives

$$Y = \frac{\mathbf{1}}{\mathbf{1} - c_1\ (\mathbf{1} - t_1)}\ \{\ c_2\ (1 - t_2)\ A + \propto r + \beta\ (I - t_3)\ R + \bar{G}\}$$

An this point something remarkable may be observed. The personal income tax rate t_1 affects the Keynesian multiplier $\frac{\mathbf{1}}{\mathbf{1} - c_1\ (\mathbf{1} - t_1)}$: when t_1 is increased, $1 - t_1$ becomes smaller, therefore the denominator $1 - c_1\ (1 - t_1)$ becomes larger, and thus the Keynesian multiplier $\frac{\mathbf{1}}{\mathbf{1} - c_1\ (\mathbf{1} - t_1)}$ smaller. Supposing $t_1 = 0.25$, an increase of one percentage point up to $t_1 = 0.26$ changes the value of the multiplier from to $\frac{\mathbf{1}}{\mathbf{1} - \mathbf{0.8}\ (\mathbf{1} - \mathbf{0.25})} = 2.\ 5$ to $\frac{\mathbf{1}}{(\mathbf{1} - \mathbf{0.8})\ (\mathbf{1} - \mathbf{0.26})} = 2.45.$ so if the autonomous expenditures were $\$400$ billion, GNP would be reduced from $2.5 \times 400 = \$1000$ to $2.45 \times 400 = \$980$ billion.

Suppose now that there is a multiplier $\frac{1}{1-c_1(1-t_1)} = 2.5$ and $t_2 = 0.40$

The income wealth multiplier relationship is

$$\Delta Y = \frac{c_2(1-t_2)}{1-c_1(1-t_1)} \Delta A ;$$

A marginal change wealth is multiplied to larger income change. The income / wealth multiplier has the value of

$$\frac{c_2(1-t_2)}{1-c_1(1-t_1)} = \frac{0.1(1-0.4)}{0.4} = 0.15$$

If it is supposed that wealth amount to $\$1000$ billion, a property tax rise of 1 percentage point from $t_2 = 0.40$ to $t_2 = 0.41$ changes the income wealth multiplier from 0.15 to $\frac{0.1(1-0.41)}{0.4} = 0.1475$, and GNP drops by $(0.15 \times 10000) - (0.1475 \times 10000) = \$25$ billion.

The analysis of the corporation income tax rate is analogous to the property tax rate. of course t_1 , t_2 and t_3 do not include only the personal income tax, the property tax, and the corporation income tax respectively, but also the effects of the excise taxes on the consumption and investment goods that are sold.

Problem

What is the effect on savings of a tax cut of $\$10$ billion? Is this inflationary or deflationary? Assume the marginal propensity to consume is 0.85

Answer

Because taxes affect disposable income, they affect savings A cut in taxes increases disposable income Y – T, where Y is income before taxes and T is taxes. The marginal propensity to save out of income is 1 minus the marginal propensity to consume: S = I – C = $1 - 0.85 = 0.15$, when taxes are cut by $\$10$ billion, the effect on Savings will be an increase of:

$$\Delta S = s(-\Delta T) = 0.15\ [-(\$10 \text{ billion})]$$

$$= 0.15 \text{ x } \$\ 10 \text{ billion} = \$\ 1.5 \text{ billion}$$

The remainder of the addition to disposable income $\Delta T - \Delta S = \$10$ billion – $\$1.5$ billion = $\$8.5$ billion will go to increased consumption demand. This increased consumption demand will be amplified by the multiplier process. The multiplier $\frac{1}{1-c} = \frac{1}{0.15} = 6.67$; thus the effect on the economy will be an increase in income of $\Delta Y = \frac{-c\Delta T}{1-c} = \frac{8.5}{0.15}$ = $\$56.67$ billion.

Problem

In a given economy, household save $\%10$ of their incomes: the current income tax burden is $\%25$: planned investments are expected to be $\$60$ billion; and the trade deficit is about $\$2.5$ billion. Current government expenditure are $\$270$ billion per year. The full capacity GNP level is $\$1060$ billion.

What is the current deficit? What is the full employment deficit? Compare the two is the current budget expansionary or concretionary? Explain.

Solutions:

First, it is necessary to calculate the current level and infer the taxes in order to see the current budget deficit. Then the full employment deficit must be calculated and compared with the current budget deficit. National income equals the total of expenditures, consumption, planned investment, government expenditures and the trade surplus. (the trade surplus equals (exports − imports) Thus.

$$Y = C + I + G + (EX - Im)$$

Consumption can be described by the relationship where households consume 90% of their disposable income; the rest 10% is saved. Thus

$$C = 0.90\ (Y - T)$$

Where Y – T is disposable income, Taxes are proportional to income

$$T = 0.25Y$$

Substituting this in the income relationship results in

$$C = 0.90\ (Y - 0.25Y) = 0.90 \times 0.75Y = 0.675Y$$

Substituting this new figure into the income identity yields

$$Y = 0.675Y + I + G + (EX - Im)$$

The multiplier is thus equal to $\frac{1}{0.325} = 3.077$, current GNP can now be determined by substituting the values of planned investment government expenditures and the trade balance into the relationship above:

$$Y = \frac{1}{0.325}(60 + 270 - 2.5) =$$

$$Y = 3.077 \times 327.5 = \$1007.72 \text{ billion}$$

Notice that the trade deficit is a negative trade surplus, unemployment exists because GNP is below its full capacity level current taxes are:

$$T = 0.25 \times 1007.72$$

$$= \$251.93 \text{ billion}$$

The government expenditures are larger than tax revenues; thus the current budget deficit is:

$$G - T = 270 - 251.93 = \$18.07 \text{ billion}$$

The full capacity GNP is $\$1060$ billion. Total tax revenues in the full employment situation would be $T = 0.25 \times 1060 = \$265$ billion so that the full employment deficit would be $G - T_f = 270 - 265 = \$5$ billion.

The actual or current budget deficit depends on the initial position of the economy and the tax revenues at that level of income. The current budget has an ultimate inflationary effect because the full employment budget based on the current savings behavior, tax rates investment

plans and trade-balance shows a deficit. The full employment balance, therefore gives a clearer picture of what the ultimate effect of the introduced budget policy will be than does the actual budget.

Problem

Suppose households consume 85% of their disposable income, what is the effect on national income if income taxes are increased by 4%? If sales taxes are increased by 4%? Assume the initial tax rate is 20% in both cases.

Solutions:

Sales taxes and excise taxes are related to expenditure rather than income. Their totals move up and down with income because consumption expenditures do so. In other words, income taxes fall on both consumption and saving. While sales taxes fall only an consumption

Consumption expenditure is given by the equation

$$C = c(Y - T)$$

Where $(Y - T)$ is income minus taxes or disposable income taxes are proportional to income

$$T = ty$$

Thus

$$C = c(Y - ty) = c\,(1 - t)Y$$

$$=0.85(1-0.20)Y = 0.68Y$$

When the income tax rate is increased by 4% consumption expenditures decrease

The multiplier is initially

Then

$$Y= 0.85y - 0.85(0.20)Y$$

$$Y - 0.85\ y + 0.85(0.20)Y = 0$$

$$Y_d\ (1 - 0.85(1 - 0.20) = 0$$

$$Y_d = \frac{1}{(1 - 0.85)(1 - 0.20)} = \frac{1}{1 - 0.68} = 3.1$$

However, when the tax rate is raised by 4% the multiplier decreases in value to

$$Y_d = 0.85y - 0.85(0.24)Y$$

$$Y - 0.85y + 0.85(0.24)Y = 0$$

$$Y= (1 - 0.85)(1 - 0.24) = 0$$

$$Y= \frac{1}{(1 - 0.85)(1 - 0.24)} = \frac{1}{(1 - 646)} = \frac{1}{(0.354)} = 2.82$$

Taking into consideration that only 82% of disposable income is consumed the amount of income affected by the tax is $0.85 \times 4\% = 3.4\%$

Thus income falls by $2.82 \times 3.4\% = 9.5\%$

The sales tax falls on expenditures only, thus the multiplier of 3.1 remain unaffected;

Expenditure are lowered by 4%, income will then fall by $3.1 \times 4\% = 12.4\%$

Exercises

The following statements are true (T) or false (F)

1- Fiscal policy is the use of government spending and tax policy to achieve social goals.

2- When government spending is increased equilibrium income decrease.

3- Stabilization goals refer to government's impact on inflation, Unemployment and economic growth.

4- The rise in the rate of interest causes a rising in planned investments.

5- Tax policy has its impact aggregate demand through its influence on consumer disposable income.

6-The IS-Schedule represents the point of equilibrium in the financial markets.

7- Fiscal actions have their affect in the future

8- The increase in government spending and its consequences shift the IS-schedule to North-East.

9- During recession the level of benefits falls and government collects tax revenues to fund the system during the next expansion.

10- The initial effect of an autonomous increase in government spending is an increase in aggregate demand.

11- Government provides public goods.

12- When the deficit is financed by borrowing in the financial markets, the money supply is unchanged.

13- Keynesians believe that market economies tend to be efficient, equitable, stable and capable of achieving a rapid rate of growth.

14- The LM- schedule represents the points of equilibrium in the commodities markets.

15- Balanced budget increases are contractionary.

16- The reduction in investment means a reduction in aggregate demand.

17- Fiscal policy is the policy of the government with regard to the level of government spending and the tax structure

18- The increase in government spending shifts the IS-schedule to the right when the interest rate is fixed.

19- Fiscal policy determines quantities government expenditure, transfer payments and tax indirectly.

20- The stability of the economic system is dependent on the size of the multiplier and the rate at which the tax revenues vary directly with NNP.

21- Distributional goals refer to the impact of budget policies on the distribution of income in society.

22- Under the progressive tax system, when income increases, the tax rate as well as the taxes collected increase.

23- The classical believe market economies are prone to inefficiency, inequity, instability.

24- The lump sum tax system is destabilizing over time when NNP gradually increases.

25- Balanced budget decreases are expansionary.

26- A progressive tax structure is one in which the percentage of income collected in taxes is greater for higher incomes than for lower ones.

27- Fiscal policy determines quantities income and consumption directly.

28- Government budget deficits will stimulate the economy but an increasing NNP will gradually eliminate that budget deficit.

29- When the economy has no tax system, the marginal propensity to consume can be determined from the given consumption.

30- When the government levels personal income taxes the disposable personal income and personal consumption are increased>

31- All government policies have different impacts on different groups of people.

32- When the government levies corporation income taxes, it influences investment out of retained earnings of business.

33- Government spending is a component of aggregate supply.

34- When retail sales taxes are levied, the spending power of the consumers, the sales revenues, and thus the retained earnings and investments are affected.

35- The effect of a proportional tax structure on inflation is much less than that of a progressive tax structure.

36- Discretionary policy occurs when government consciously sets spending and taxes to achieve particular goals.

37- A regressive income tax structure is one in which the percentage of income collected in taxes is lower for higher income than for lower incomes.

38- Property taxes affect the wealth owned by individuals and businesses and will thereby again affect consumption and investment.

39- The effect of a progressive tax structure when incomes are rising is to rise inflationary pressure.

40- A Proportional tax structure is one in which the percentage of income collected in taxes is the same for all levels of income.

41- There are two types of income tax systems: the proportional tax. And the lump-sum tax

42- The inflationary unemployment gap occurs when the demand lower than the potential output capacity of the economy

43- The lower the tax rate, the more leakage in the income expenditure flow that occurs.

44- The increase in the lump-sum tax only reduces the total expenditures.

45- When the aggregate demand is higher than the potential output capacity: the excess purchasing power results in inflation.

46- When planned investment is higher than planned savings, the economy glides into a recession.

47- In case the balanced budget is balanced, the total increase in government expenditures must higher than the total increase in taxes.

48- An increase in the taxes would reduce the purchasing power available to the public and so also reduce the primary inflationary pressure.

49- In the case of a balanced budget, total government expenditure equals the deflationary gap.

50- The deflationary unemployment gap occurs when the demand higher than the potential output capacity of the economy.

51 As incomes moves downward and unemployment increases both unemployment benefits and welfare payments will increase.

52- When output increase, there is an equivalent upward push.

53- The tax revenues of the government are automatically increased because inflation pushes income earners into higher tax brackets.

54- The labor force is defined as those individuals who are either working or are actively seeking work.

55- Open inflation results when the price stability breaks down and prices start rising to match the value of the planned expenditures.

56- Cost-push occurs when factors on the supply-side of the economy increase costs of production.

57- The demand-pull theory of inflation states that aggregate demand is lower than the potential output of the economy.

58- The interest rates tend to fall during periods of inflation

59- If the level of total demand will be at a high level, then it will be profitable to produce more.

60- In the case of the CPI, the market basket consists of intermediate goods at the wholesale level then period the cost of both market baskets is computed.

61- The purchasing power of money is the real value of money.

62- Inflation can be defined as an increase in the general price level

63- Nominal GNP is the sum of the products of the quantities of goods purchased times their prices

64- Deflation is a decrease in the value of the dollar.

65- Rising per capita income and growth of the population tend to increase the demand.

66- The real rate of interest is the-rate charged in terms of purchasing power.

67- Excess aggregate demand thus creates an almost permanent deflationary gap.

77- The unemployment rate is the proportions of the labor force that is without work but actively seeking a job.

78- Excess aggregate demand pushing the general price level quickly downward.

79- A rise in the general price level is called deflation

80- Supply consists of domestically produced goods and imported goods.

81- The inflation occurs when the prices of some goods to rise while others fall.

82- Repressed inflation results when the prices are not allowed to rise by explicit price controls

83- Inflation is an increase in the value of the dollar.

84- If equilibrium income exceeds the output capacity and deflation results.

85- The nominal rate is the rate actually charged.

86- If total demand is at a low level. Many businesses will not find it profitable to produce a large volume of goods and services.

87- Frictional unemployment is people that laid off or fired or just entered the labor force.

88- The purchasing power of money is the real value of money

89- The Philips curve refer to periods of high inflation have usually been associated with low unemployment.

90- In deflation, there is a fall in the general price level

91- Inflation can exist if the average level of all prices rises.

92- Inflation occurs if at the fill employment level of income, the supply of money is greater than the demand for money.

93- Stagflation is defined as a period when both inflation and unemployment are low.

94- A lower rate of inflation is accompanied by a higher unemployment rate.

95- During periods of inflation, lenders determine the nominal rate of interest they charge by adding the expected rate of inflation to the real rate they wish to receive.

96- The Phillips curve shows the trade-off between the level of unemployment and the level of inflation for a given economy.

97- Structural unemployment is people unemployed when job vacancies exist but who cannot apply for the vacancies because they lack the appropriate skills.

98- Stagflation is the situation of a simultaneous occurrence of inflation and unemployment.

99- The Philips curve refer to Periods of high unemployment have usually been associated with high inflation.

100- Frictional unemployment occurs when workers become unemployed because the industry is replacing workers by machines.

101- Deflation is a fall in the general price level.

102- The inflation rate equals the rate of increase in the money supply minus the rate of increase in the real money demand

103- In the case of the PPI, the market basket consists of the goods and services the typical consumer buyers each month.

104- Cyclical unemployment occurs when the economy is for some reason producing at a lower level than that desired by society.

105- Money balances decrease in Purchasing power during a time of inflation.

106- Stagflation is the simultaneous occurrence of stagnation in the growth of real output.

107- In demand-pull inflation, aggregate demand 175 exceeds the economy's ability to produce goods and services.

108- If the money supply is increase, the demand exceeds the quantity of money supplied at the full employment level.

109- Cyclical unemployment is unemployment resulting from too few jobs.

110- Stagflation is a combination of stagnation in the growth of real output, resulting in high unemployment rates. Coupled with inflation.

111- The Phillips curve refers to an empirically-observed relationship between inflation and unemployment.

112- Structural unemployment occurs as workers changes jobs

113- Inflation is induced there by an increase in the labor costs.

114- Unemployment increases when the overall level of business activity increases.

115- The real interest rate is the rate that is actually paid.

116- Structural unemployment occurs when the number of employees reduce because of an increase in the efficiency of use of labor.

117- The real interest rate is equal to the money interest rate minus" the percentage price rise.

118- Apparent unemployment or underemployment is the case wherein the worker may have a job but, in a sense, still not be employed to the limits of his capability.

119- When prices are rising, money interest rate must rise in order to keep real interest rate constant.

120- The nominal wage increase consists of the real wage increase and the increase in the general price level.

121- Cyclical unemployment occurs in the recession phase of the business cycle

122- The nominal interest rate is one that expresses the real return on lending money.

123- The money rate of interest equals the sum of the real rate of interest and the inflation rate.

124- The nominal rate of interest takes inflation into account.

125- Keynesian Theorists rely on the portfolio adjustments.

126- The disguised unemployment is the situation wherein a worker is involuntarily out of work.

127- The fall in the interest rates makes borrowing for business cheaper and investments will expand

128- The natural rate of unemployment is that rate of unemployment at which flows in and out of unemployment just balance.

129- When the expected rate of return is higher than the interest rate, more funds will be borrowed and invested.

130- Every increase in national income does necessarily result in an increase of employment.

131- The increase in the money supply M. increases the money balances above their desired levels and people start to buy.

132- The recession causes unemployment to decrease

133- In order to maintain the equality between the supply and demand for money, changes in the nominal money supply must equal changes in the price level.

134- Inflation will be a form of cost-push inflation.

135- At the higher interest rate people are willing to hold more money relative to their holdings of other assets.

136- The income elasticity of the demand for change in the real money demand caused by the relative marginal change in real income.

137- A higher national income represents either a larger real income or higher prices or combination of both

138- Monetary Theorists use the effects on interest rates and investment.

139- The duration of unemployment is the average period of time to find and accept a job.

140- The real rate of interest is the actual percentage represented by the interest paid by a borrower.

141- Technological unemployment is caused by innovation and advancement in machinery which replaces human workers.

Chapter Eight

Chapter Eight

INFLATION AND UNEMPLOYMENT

Inflation can be defined as an increase in the general price level. Inflation should not be confused with increases in the prices of individual goods. In an economy where tastes and technology are constantly changing, we should expect prices of some goods to rise while others fall. Inflation can only be said to exist if the average level of all prices rises.

An alternative but equivalent definition of inflation is a fall in the purchasing power of the dollar. The purchasing power of the dollar is a measure of the quantity of goods and services a dollar cot-dd buy. If prices rise, the dollar cannot buy as much, leading to the definition.

Deflation is a fall in the general price level or an increase in the value of the dollar. Stagflation is defined as a period when both inflation and unemployment are high. The three most widely-used measures of inflation are:

(1) The GNP Deflator

(2) The Consumer Price Index (**or Cost of Living Index**).

(3) The Producer Price Index (**or Wholesale Price Index**).

The theory behind the construction of both the CPI and PPI is similar and fairly straightforward. In both cases, a "**market basket**" of goods is constructed. In the case of the CPI. the market basket

consists of the goods and services the typical consumer buyers each month. In the case of the PPI. the market basket consists of intermediate goods at the wholesale level Then period the cost of both market baskets is computed, using the prices prevailing during each period.

For example, in year 0 the price of the CPI market basket is found by multiplying each item in the basket by its year 0 price.

$$\sum P_i^0 Q_i^0$$

Year 1 prices are used to compute the cost of the market basket in year 1.

$$\sum P_i^0 Q_i^0$$

The percentage change in the cost of the market basket between the two years change in the cost of living.

Typically, index numbers are used to express the cost of the market baskets. A base year is arbitrarily chosen and given an index of 100. The index for the other year is simply scaled up or down by the change in the cost of living. If the cost of living was 5% higher in the other year, its index value would be 105. Assume year 0 is chosen as the base year, the index value for year 1 (X) is determined by solving the following ratio problem:

$$\frac{X}{100} = \frac{\sum P_i^1 Q_i^1}{\sum P_i^0 Q_i^N} \text{ where X } = \frac{\sum P_i^1 Q_i^1}{\sum P_i^0 Q_i^N} \ 100$$

Index numbers are used to deflate nominal into real or, in other words, to compute the purchasing power of a nominal value. If Y_i is the nominal value of the something in year i. and CPI. is the price index that year, then the real value of Y (R_i) is given by:

$$R_i = \frac{Y_i}{CP_i} 100$$

For example, median family income in the United States in nominal terms was $\$3.031.00$ in 1947 and $\$30.853.00$ in 1987. Did family living standard rise 10 times over the 40-year period? Using $1985-84$ as the base year, the consumer price index was 22.3 in 1947 and 113.6 in 1987. Prices, therefore, rose 5 times. To compare incomes we need to compute their real equivalent, or, in other words, compute the purchasing power of the income in both years. The formulas are as follows:

$$1947: \frac{\$\mathbf{3.03100}}{\mathbf{22.3}} 100 = \$13.591.00$$

$$1987: \frac{\$3.853.00}{113.6} 100 = \$27.1591.00$$

Ream median family income has actually doubled over the 40 year period.

Is inflation a good or bad thing? An unambiguous answer cannot be given. On the basis of business cycle history, it is the case that inflation problems have been more common during periods of prosperity than periods of recession. Nonetheless, there are some very real problems associated with inflation even in the best of times. For one thing, some people's incomes are relatively fixed in the sense that they do not keep

pace with prices. These people lose purchasing power and end up worse off through no real fault of their own. Of course, a rise in prices increases the value of goods and services produced and incomes equally. So if some people fall behind it means others must enjoy incomes rising at a rate faster than prices.

Inflation will exact a toll on wealth whose value is relatively fixed in nominal terms. Money balances decrease in purchasing power during a time of inflation. It u well-known that interest rates tend to rise during periods of inflation. This is likely related to the effect that inflation can have on wealth. Lenders will attempt to protect the real value of the wealth they lend by adding the expected rate of inflation to the rate of interest they charge. Unfortunately, the prediction or inflation rates is hazardous.

An important distinction is between the nominal and real interest rates. The nominal rate is the rate actually charged. For example, assume a nominal rate of 10% of charged on a one-year loan of $1.000.00. On the due date, $1.100.00 would be repaid ($1.000 principal plus $100.00 interest). This amount has a purchasing power $1.100.00/$1.000.00 = 10% more than the amount originally lent. The real rate of interest is the-rate charged in terms of purchasing power. Assume there was 5% inflation during the year. On the due date, $1.100.00 would be paid, but the money has a purchasing power of approximately $1.050.00 (If the CPI is 100 at the beginning of the year, it will be 105 at the end. Deflating the amount repaid as explained above will give the purchasing power of the money repaid, which is

$1.050.00/$1.000.00 = 5% more than the amount originally lent). The real rate on interest is approximately 5%. If we subtract the rate of inflation from the nominal interest rate, we get an approximation of the real rate. A 10% nominal rate is only a 5% real rate if there has been 5% inflation. During periods of inflation, lenders determine the nominal rate of interest they charge by adding the expected rate of inflation to the real rate they wish to receive.

Inflation exacts a cost in terms of economic efficiency. There are numerous ways this can take place. Probably the most general statement of the problem is that during a period of inflation, the future is made to appear more uncertain. Consequently, people will develop more resources to current consumption and less to investment, reducing the economy's ability to grow.

Inflation can be categorized by type. This categorization is useful because it provides a guide to the proper anti-inflation policy. One type of inflation is demand-pull. In demand-pull inflation, aggregate demand exceeds the economy's ability to produce goods and services, causing prices to be "**pulled up**". Excessive demand can be the result of overly-simulative fiscal or monetary policies, investment or export booms, or consumptions binges. The description of the problem suggests the solution. If the problem is too much demand, the solution is to reduce demand. Restrictive monetary or fiscal policy will usually be called for,

Another type of cost-push inflation, Cost-push occurs when factors on the supply-side of the economy increase costs of production, forcing

firms to pass the increased costs on to consumers in the form of higher prices. There are several variants of the cost-push model, each suggesting a different sector of the economy as the "**culprit**". Wage-push models suggest that irresponsible wage demands, particularly on the part of unions, cause the cost increase that are passed onto consumers. Profit-push models spotlight greedy big business's grab for higher profits. Supply-shock models start with resource scarcity that pushes up costs, necessitating price increase.

As in the case of demand-pull inflation, the description of the problem suggests the solution, although the solution is not always painless Wage-or profit-push situations suggest either labor or business is too powerful and consequently government may have to step in to curb their power. Wage and Price controls in a commonly advocated policy to reduce cost-push inflation. Wage and Price controls are government law which limit how much wages and prices are permitted to rise. The solution to supply-shock inflation is to eliminate the bottleneck or natural condition that made die resources scarce in the first place.

Many economists think that much inflation results from so-called "**self-inflicted wounds**". frequently government policies that restrict economic growth and cause other inefficiencies. For example, excessive taxes may stifle the incentive to work, save, and invest. An overly-generous welfare system may reduce the incentive to become self-supporting. Tariffs and other restrictions against foreign competition may protect "**lazy**" firm. A revision of government policies is called for in all these cases.

The labor force is defined as those individuals who are either working or are actively seeking work. Only about 65% of the population is the labor force at any one time. The unemployment rate is the proportions of the labor force that is without work but actively seeking a job.

A non-controversial national goal is fill employment. Achieving full employment does not mean a 0% unemployment rate. There is some unemployment at full employment — the fill employment unemployment rate — also known as the natural unemployment rate. The reason for this is related to the different types of unemployment.

There are three main types of unemployment. Frictional unemployment is people "**between jobs**", individuals who have just been laid off or fired or just entered the labor force to begin looking. They are likely to find a job but have not done so immediately because information ?????? ???? ?????, or is not ???? available, but must be discovered by a time-consuming process of search. Structural unemployment is people unemployed when job vacancies exist, but who cannot apply for the vacancies because they lack the appropriate skills. Technological change may be an important cause of this problem.

Both types of unemployment are inevitable in an economy such as ours. Consequently, when only frictional and structural unemployment are present, we may consider ourselves at full employment. Economists cannot say exactly what number constitutes full employment. Most economists today say anything between 4% and 5.5% represents full

employment. This is not to imply that employment is an immutable level. Labor market policies to provide better job market information or job retraining may reduce the amount of both types of unemployment we have to put up with.

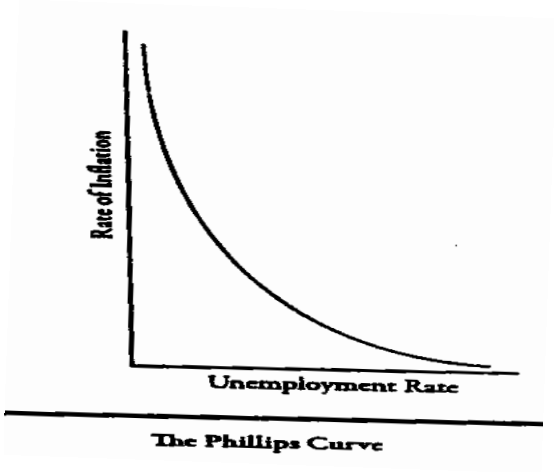
Cyclical unemployment is unemployment resulting from too few jobs. Its seriousness is not doubted by anyone.

An important economic relationship is Ohm's law. The law says that real GNP drops 3 percentage point for every 1 percentage point increase in the level of unemployment. If full employment is considered to be 5%, and actual unemployment is 7%, the GNP is approximately 6 percentage points below potential.

A simple way to calculate the employment consequences for occupations or industries of the changes in output in a particular industry i(ΔY_i) is to use the labor-input ratio $\left(\frac{L_i}{Y_i} \right)$ for that industry. The change in employment, ΔL_i . is equal to $\frac{L_i}{Y_i}$.ΔY_i. Aggregating across all industries gives employment consequences for the economy as a whole. This method is frequently used to make forecasts of future skill needs for the economy, but suffers from the strong assumption that labor-input ratios are fixed for occupations and industries.

The Phillips curve refers to an empirically-observed relationship between inflation and unemployment. Periods of high unemployment have usually been associated with low inflation. Periods of high inflation have usually been associated with low unemployment. Reductions in unemployment have usually been associated with rising rates of inflation, even before

the economy has achieved full employment. The Phillips curve then represents the trade-off that is thought to exist between the two problems. The diagram gives an example of a simple Phillips curve.



It is now recognized that the Phillips curve is not a stable relationship. The Phillips curve may shift in or out, representing an improving or worsening trade-off. Shifts in the Phillips curve may result from economic inefficiency, cost-push or supply-shock factors, or changing inflationary expectations.

The Federal Reserve System (**Fed**) has tools at its command which permit it to influence the level of spending in the economy. Through open-market operations, changes in the required reserve ratio, and changes in the discount rate, the Fed can influence the ability of banks to extend credit. The ability of banks to led will influence interest rates. stimulating or reducing the investment spending which is a component of aggregate demand.

Monetarism is a school of though within the economics profession. There are two basic tenets to remember. First, Monetarists believe that

changes in the money supply are the most important factor influencing the health of the economy. They do not believe that money is the only factor influencing the economy. Second, they do not believe that the Fed should pursue an activist monetary policy, attempting to combat every slowing of the economy or hint of higher inflation. Since Fed actions do not affect the economy immediately, but only after a potentially long period of time, perhaps a year or two, and since our ability to forecast that far ahead is pitiful, Fed attempts to pursue an activist policy are likely to lead to the wrong policy as often as the right one. The better decision is for the Fed to cause the money supply to grow at a constant rate no matter what. By reducing fluctuations in the money supply, the Fed will have reduced the major source of economic instability and will not be attempting to do what it truly cannot do.

STEP-BY-STEP SOLUTIONS TO PROBLEMS

THIS CHAPTER

"INFLATION AND UNEMPLOYMENT"

INFLATION. DEFLATION AND STAGFLATION

[Problem 1]

A rise in the general price level is called---? How is this change measured?

Solutions: A rise in the general price level is called inflation and it is usually measured with the help of 3 indices:

(1) consumer price index (CPI);

(2) The wholesale price index (WPI), which are both published by the Bureau of Labor Statistics; and

(3) The GNP deflator, published by the Department of Commerce.

The CPI or WPI, is the ratio of today's cost of a basket of goods of fixed composition. If we denote the base year quantities of the various goods by q_0^i and their base year prices by q_0^i the cost of the basket in the base year is

$$\sum P_0^i q_0^i$$

Where the summation ($\sum$) is over all goods in the basket. The cost of a basket of the same quantities but a today's prices is

$$\sum P_1^i q_0^i$$

Where P_1^i is today's price. Then the price index $= \frac{\sum P_i^1 q_0^1}{\sum P_0^i q_0^1} \times 100.$

The GNP deflator is the ratio of the nominal GNP to the real GNP

$$P = \frac{\text{nominal GNP}}{\text{real GNP}}$$

So that real GNP is nominal GNP deflated

$$\text{realGNP} = \frac{\text{nominal GNP}}{\text{P}}$$

[Problem 2]

Elaborate on the following statement: inflation also casts its evil eye upon savers. Give an example to make your point clear.

Solutions" : Inflation also casts its evil eye upon saver. This means that as prices rise the real value, or purchasing power of a liquid saving will deteriorate. Savings accounts, insurance policies, annuities, and other fixed-value paper assets which were once adequate to meet rainy-day contingencies Mortgage holders and bondholders will be similarly affected. A household's accumulated claims upon the economy's output becomes less in value as prices rises.

However, two important clarifications have to be note. First, stock values are flexible and determined by current market conditions; hence, savings in this form will tend to increase in value with, or in some cases ahead of, the general level of prices. Secondly, so long as the interest rate of savings exceeds the race of inflation, the purchasing power of

savings will increase rather than diminish. For example, the purchasing power of a $1000 savings account will increase if the annual interest rate is, say 5 percent and the annual increase in the price level is only 3 percent.

[Problem 3]

What are some of the undesirable effects of inflation?

Solutions :Inflation results in the following effects :

(1) Unjustified wealth transfers occur from net money creditors to net money debtors.

(2) When union wage contracts do not have inflation escalator clauses, and workers notice an actual decline in their real wages, they may more frequently resort to strikes creating social instability.

(3) Assume the country has fixed rates of exchange and its domestic inflation rate is higher than the inflation rate in the countries with markets, i.e.. exports less, and imports more. This situation may result in a serious balance of payments deficit. Inflation is therefore, a major cause for international monetary crises.

(4) The tax revenues of the government are automatically increased because inflation pushes income earners into higher tax brackets: the rates of the federal income tax are progressive. This may defeat the economic policy of reaching fill employment because total spending decreases, automatically.

(5) The usefulness of money as a store of value may be reduced and people will start to use money substitutes preferably those that are interest-earning, like credit accounts (**credit cards**); and they will reduce their money balances and invest more in real assets, like houses, education, automobiles.

(6) All sorts of distortive effects on the allocation of resources will occur; the operation of the credit markets will be less effective by increasing risk of borrowing and lending. the built-in price rigidities of wage and installment contracts also create distortions.

[Problem 4]

What is the difference between open and repressed inflation?

Solutions: When the planned expenditures are unattainable because the economy is already operating at hill capacity the adjustment process results in inflation.

Open inflation results when the price stability breaks down and prices start rising to match the value of the planned expenditures with the value of the full capacity output. Repressed inflation results when the prices are not allowed to rise by explicit price controls. i.e ..the prices are legally fixed. and waiting lines and backlog-lists are formed in consequence. The expenditure plans of investors and consumers are curtailed to match the existing capacity. Open inflation exists in most of the non-communist industrial economies; repressed inflation exists in most of the communist industrial economies. Note that if equilibrium income exceeds the output capacity and inflation results. the events

cannot be analyzed any more in terms of the simple income determination model.

Also, inflation usually commences with the creation of an inflationary gap; thereafter. however, it acquires its own momentum and mechanism; inflationary expectations develop and the inflation becomes self-generating.

[Problem 5]

What is meat when it is stated that "suppressed inflation" existed in the United States from 1942 to 1947?

Solutions: In the period 1942 to 1947 prices were stable; therefore, the unaware reader might conclude that inflation was not a factor the American economy at that time. However closer examination reveals that during this period wartime price controls were in effect. In 1947. when the price controls were removed, we notice that prices shot upward. The reform we speak of the years 1942-1947 as a period of suppressed inflation. During this time, inflation-causing factors were in operation but price controls suppressed, or rather postponed the inflationary impact until the prices were freed in 1947. the main inflationary factor during this period was the enormous aggregate demand for military goods and services when the economy operated at a fill employment level. Thus there was a repressed demand-pull inflation, that could be detected from long waiting lists and delivery times of the various products.

[Problem 6]

a) the theory which attributes inflation to excessive wage demands by unions or price demands by large producers is called the _____

b) The theory which attributes inflation to excessive aggregate demand is called the _____

c) Give an explanation of both theories.

Solutions: a) cost-push theory of inflation.

b) demand-pull theory of inflation.

The cost-push theory, or cost-price spiral theory of inflation requires the existence of the "**ratchet-effect**", or stickiness of prices, this means that prices move flexibly upward but are rather "**sticky**" downward. The union demands for higher wages, backed by the oligopolistic character of the trade-unions in the labor market, or the demands for higher prices for oil supplied (**a war material input**) by the Oil Producing and Exporting Countries (**OPEC is a cartel in the raw material markets**), or the autonomous price increases by large industrial producers of intermediate products (**for example, of steel**) increase the costs of producing. These raised costs are passed on to the consumers in the increased prices of the final products, inducing the general price level to increase. The consumers feel the brunt of inflation by noticing a decline in their purchasing power, (**thus in their real income**), and will require an increase in their nominal income, i.e.. their

wages and salaries, etc. This process is circular and leads to the (**cost-price-spiral**) (**See Fig, 1**).

If prices were generally flexible and moved easily downward then a reallocation of resources would take place from the unionized and oligopolistic sectors to the non-unionized and more competitive sectors. thus from the "**controlled**" sector of the economy to the "**uncontrolled**" sector of the economy.

The demand-pull theory of inflation states that aggregate demand is bigger than the potential output of the economy, pulling the general price level upward: Y demand

$$Y_{\text{potential}} = \frac{Y_{demand}\uparrow}{P\uparrow} = \textbf{constant}$$

There is an inflationary Y_{demand} - $Y_{\text{potential}}$. Such an inflationary gap may be caused by an increase in autonomous consumption $\bar{C}$ and investment In, caused by optimistic expectations, new technological developments or lower taxes on business profits.

It may also be caused by fiscal policy: increasing government expenditures, decreasing income taxes, or both, or by monetary policy: increasing the money supply and lowering the interest rates, thereby inducing more investment, (**See Fig, 2**).

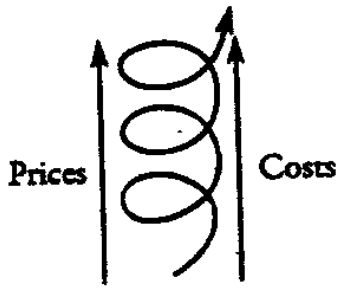


Fig. 1

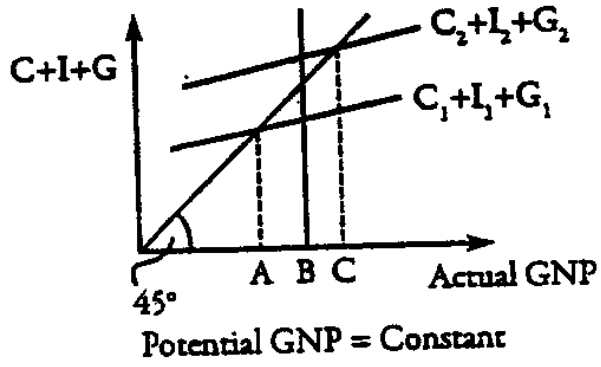


Fig. 2

AB is the deflationary gap with unemployment, to be closed by increased spending, BC is the inflationary gap.

[Problem 7]

Suppose the government decided that in order to fight inflation, labor unions will not be allowed any wage increases until further notice. What type of inflation would this besaimed at?

Solutions: This program would be aimed at cost-push inflation. By freezing wages, the government is hoping to stop the wage-price-spiral which is causing the inflation.

[Problem 8]

Suppose the government of decided to combat inflation by raising taxes on disposable income. What specific type of inflation would this be used against?

Solutions: This approach would be used to fight demand-pull inflation. By increasing taxes on disposable income, consumers will have less money available to spend, and aggregate demand would be reduced,

taking into account the multiplier effect, (**See the Chapter Income Determination: Tae Simple Multiplier Theory**)

[Problem 9]

Describe the circumstances leading to the existence of a demand-pull inflation. How does differ from the so-called "wage-push" or "cost push" inflation. and the alternative "profit-push" inflation.

Solutions: Generally speaking, the levels of output and employment, on the one hand, and the level of prices, on the other, have a common determinant: the level of total spending or demand. In an economy which is market directed such as the American economy, businesses produce only those goods which can be sold profitably. Stated differently, if total demand is at a low level, many businesses will not find it profitable to produce a large volume of goods and services. The consequence of this would be that output, employment, and the level of incomes will be low. If the level of total demand will be at a high level. then it will be profitable to produce more. The consequence of this would be that output, employment, and incomes will also increase correspondingly. Finally, the economy may strive to spend beyond its capacity to produce. However, the business sector cannot respond to this excess demand by expanding real output for the reason that all available resources are fully employed. Therefore, this excess demand will bid up the prices of the fixed real output, causing the so-called demand-pull inflation.

The cost-push inflation is based upon the assumption that labor unions and big businesses both possess significant amounts of monopoly or market power with which to raise wages and prices and that this power becomes easier to exert as the economy approaches full employment. Hence, the "**wage-push**" or "**cost-push**" inflationary condition may be outlined as follows: As the economy moves toward fill employment, labor markets tighten and unions become more aggressive in their wage demands Furthermore, increasing prosperity will tend to enhance the willingness of businesses to grant union wage demands. It will become harder for firms to resist union demands and risk a costly strike at the very time when business activity is becoming increasingly profitable. In overall effect of a more profitable business environment is that the economic expansion provides gradually a more favorable environment for the use of the monopoly power to pass wage increase on to consumers in the form of higher product prices.

Alternatively, market-power inflation may be "**profit-push**"; that is, inflation may be initiated by businesses as they seek $_{\text{higher}}$ profit margins. Large corporations which have the ability to manipulate or administer their prices may decide to increase prices to expand their profits.

[Problem 10]

What is the importance of the so-called "rule of 70"

Solutions :Given the annual rate of inflation, the" **rule of 70** "allows one to quickly calculate the number of years required for a doubling of the price level. Specifically, the number of years necessary for the price

level to double is found by dividing 70 by the annual rate of inflation. For example, a 3 percent annual rate of inflation will double the price level in about $23(=70 \div 30)$ years .An 8 percent annual rate of inflation will double the price level in about $9\ (= 70 \div 3)$ years .

[Problem11]

When your cash balances are at present $\$1.000$ and inflation is expected to be 12% per year, what will be your real balances after 4 years in terms of current prices?

Solutions: Real balances are money holdings expressed in the terms of goods and services they can buy; they are held in relation to the customary expenditures on goods and services.

To cash balances buy $\$1.000$ worth of goods and services in current prices; so your real balances are at present in current prices equal to $\$1.000$.

After one year inflation the purchasing power of one dollar is decreased by 12%. so your real balances after one year in current prices are only $(1 - 0.12) \times 1.000 = 0.88 \times 1.000 = \$880$. One other year of inflation reduces the purchasing power to

$(1 - 0.12) \times 880 = \$744.40$

In the third year your real balances are $(1 - 0.12) \times 744.40 = \$681.47$. in current prices; and in the fourth year $(1 - 0.12) \times 681.47 = \$599.69$. this is a dramatic decrease in real value.

Looking at the process we see that we could also calculate the real value in the fourth year more directly by:

$$(1 - 0.12)(1 - 0.12)(1 - 0.12)(1 - 0.12) \times 1.000$$

$$= (1 - 0.12)^{4} \times 1.000 = 0.59969 \times 1.000 = \$599.69$$

In general. the real balances in current prices after n years are $(1 - \pi)^{n} \times A$ where π = inflation rate, n = number of years, A = present cash balances.

The drop in the purchasing power of your money can be counteracted when you invest part of your cash balances in some from of wealth, like corporate stock, bonds, consumer durables, the prices of which will rise along with the general price level.

[Problem 12]

What happens to the purchasing power of money when there is inflation? What does it mean?

Solutions: The purchasing power of money is the real value of money, i.e.. what you can buy for each dollar. Nominal GNP is the sum of the products of the quantities of goods purchased times their prices:

Nominal GNP $= P_1Q_1 + P_1Q_2 + P_3Q_3 + \ldots + P_nQ_n$

It is also equal to real GNP times the GNP-deflator: nominal GNP = real GNP × deflator = **Q** × P. the deflator is the general price level. From the exchange equation we know that nominal GNP = P × **Q** = M × V where M is the quantity of money supplied and V is the velocity of the money

turnover, i.e.. the frequency with which money changes hands. Suppose the quantity of money supplied and the velocity do not change over time, so that nominal GNP is constant. Then when there is inflation and the general price level P creeps up, real income = real GNP decreases, $\overline{MV}$= constant = P↑ × **Q**↓. and less goods can be purchased with the same amount of money.

[Problem 13]

What is the inflation tax?

Solutions: The value of the inflation tax is the amount that individuals have to add to their cash balances every year to keep the real value of their cash balances constant, ΔM is amount of nominal balances added to the cash balances, P the general price level and T_{infl} the real value of the inflation tax, so that:

$$T_{infl} = \frac{\Delta M}{P}$$

When we multiply and divide by M we obtain:

$$T_{infl} = \frac{\Delta M}{P} . \frac{M}{P}$$

M / P is the holding of the real balances, and ΔM / M is the growth rate of the money supply. In the long run the growth of the money supply M is equal to the rate of inflation, because the real output Q is determined by the autonomous forces of increase in the population and in the labor productivity, So

$$T_{infl} = \pi . \frac{M}{P}$$

For example, when the real money holdings are 2000 and the rate of inflation is 9%, the inflation tax is:

$$0.09 \times 2000 = 180$$

[Problem 14]

What is the portfolio adjustment theory of inflation? Explain

Solution: The portfolio adjustment theory of inflation is the theory of inflation that is based in the increase in spending caused by the decrease in the money balances held by the public. According to the theory, people adjust money balances to the lower desired levels of money holdings. Inflation occurs if at the fill employment level of income, the supply of money is greater than the demand for money

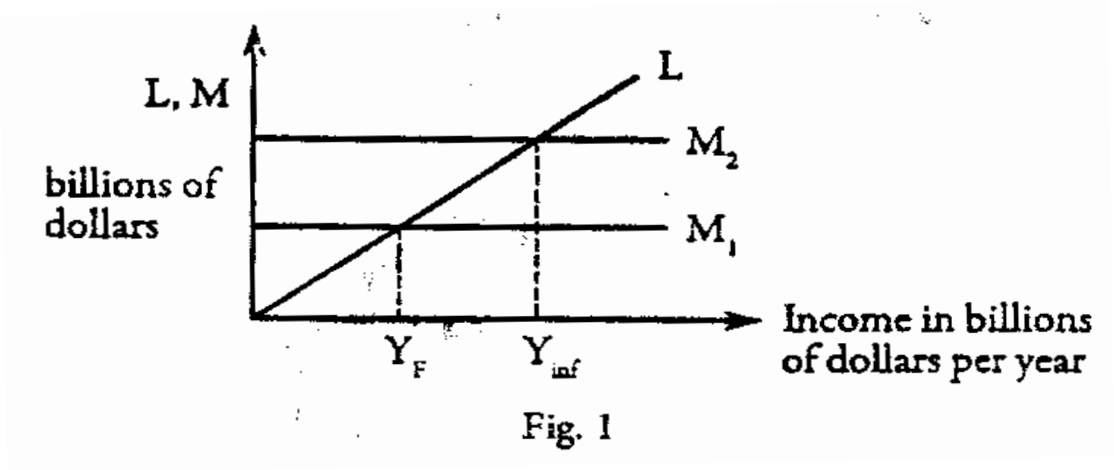


Fig. 1

The money demand L in Figure 1 is related to the level of income (transactions demand for money). The money supply M is autonomously determined by the Federal Reserve (**FED**) (**See Fig, 1**).

If the money supply is increase from M_1 to M_2, the quantity of money supplied at the full employment level Y_F exceeds the demand. The

portfolio adjustment theory explains then that total spending, or transactions, increase because the money balances people hold are too high; prices are bid up, thereby causing nominal income Y to rise to Y_{infl}. the level of inflationary nominal income.

As prices rise. the demand for money increases because people notice that the real value of their money balances, i.e.. the balance difference between their money debts and money assets, diminishes. Here inflation is induced by monetary policy. But the L–Schedule may also shift upward autonomously because of expectations of inflation, thereby causing the existing money supply to become inflationary, (**See Fig, 2**).

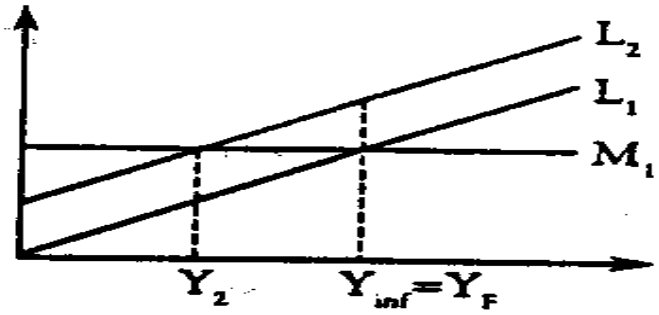


Fig. 2

This accelerates the already existent inflation, and may create unemployment because the new income level is below the full employment level. The money balances of the people are too high and they will spend their money, bidding up the prices further and thus reducing the real value of their balances.

[Problem 15]

What is structuralist theory of inflation, used mainly to explain the inflations, and hyper inflations, in Latin America? Explain.

Solutions: structuralist theory contends that inflation is a necessary The accompaniment of economic development. Rapidly rising per capita income Y_D / N and fist growth of the population N tend to increase the demand. Y_D = **(Y_D / N)** XN. so much that it surpasses the available aggregate supply. Supply consists of domestically produced goods and imported goods, (**generally of inelastic supply**). Excess aggregate demand thus creates an almost permanent inflationary gap, pushing the general price level quickly upward. Otherwise stated: the supply of imported goods and domestically produced goods is inelastic. The inelastic output of domestic production is caused by an inadequate increase in the productivity per worker, and by the high unemployment rate. Assuming an inflexible technology, we have

Total output Y_s= qh $(1 - u)\,\overline{N}$

Where q is the productivity per worker, h the average number of hours worked, u is the unemployment rate and $\overline{N}$ the labor force, which is only a part of the total population N, but directly related to it in less developed countries with their traditional work distributive roles. If the unemployment race u is high, and thus that part of the labor force that is actively employed $(1 - u)\,\overline{N}$ is low, and q the labor productivity is low (the average number of hours h is fixed) then the total output Y_s is low, and will fall short of the aggregate demand.

[Problem 16]

Which of the following is not a part of deflation?

a) depressed business.

b) reduced production.

c) higher prices.

d) unemployment.

Solutions: higher prices. In deflation, there is a fall in the general price level.

[Problem 17]

What are the characteristics of stagflation?

Solutions :Stagflation is a combination of stagnation in the growth of real output, resulting in high unemployment rates, coupled with inflation, a rapidly rising price level. Stagflation was characteristic of the macroeconomic scene of the early 1970's; it is best represented by the Phillips curve which shows that there is always a trade-off between unemployment and inflation. A lower rate of inflation is accompanied by a higher unemployment rate and vice versa When stagflation occurs. the inflation is not caused by an excessive level of demand, because then we would expect to have a high level of output, and a low level of unemployment, but by forces on the ???? or cost side of the market. The rising costs of the products upward input materials push the prices of the products causing the increase in the general price level, i.e.. inflation,

without a concomitant growth in output and reduction in unemployment. Furthermore, the rapid inflation erodes the real income, or purchasing power of consumer, and reduces the aggregate demand.

[Problem 18]

What were some causes of the stagflation in the early 1970's?

Solutions :Stagflation is the simultaneous occurrence of stagnation in the growth of real output, high or even rising unemployment levels, and rapid inflation.

It appears that part of the unemployment in the early 1970's occurred because of the rapid acceleration of the price level. The oil price increases in 1973/74 were tantamount to a gigantic excise tax paid by the customers and businesses of the western industrialized countries to the OPEC nations. The effect of this" **excise tax** "was, of course, contractionary with respect to output and employment.

Secondly, the built-in stability feature of the proportional and progressive tax systems of the western industrial countries worked perversely during this period. The money incomes of households and businesses inflated rapidly; and so, in consequence, did their personal and corporate income tax payments, The OPEC **'tax'** and higher domestic tax bills left consumers and businesses with less to spend on domestic consumer and investment goods The result was falling real output and unemployment.

In addition, some macroeconomic policy mistakes were made. The government and the monetary authorities used contractionary fiscal and monetary policies in an attempt to restrain the inflation. Since the causes of the inflation were largely on the cost side because of the higher prices of the imported raw materials, the restriction of the aggregate demand did not control the rate of inflation, but, intensified the declines in output and employment.

[Problem 19]

What are possible explanations for the recent failure of fiscal and monetary policy to solve the stagflation problem?

Solutions :Stagflation is the situation of a simultaneous occurrence of inflation and unemployment. This is often illustrated by the Phillips curve which shows the trade-off between the level of unemployment and the level of inflation for a given economy .

Monopolistic power concentration, international trade problems, and a changing composition of the labor force help to explain the stagflation phenomenon .Monopolistic concentration in a number of key industries can raise prices without excess demand .Strong unions can win wage increases, even in the face of substantial national Strong unions unemployment, "**monopolies**", meanwhile, can set their prices irrespective of general situation of competition.

Consequently, periodic declines in the level of aggregate demand no longer function as an effective restraint on price increases. An expansionary monetary policy which lower the interest rate increases the

US. payments deficit, because businesses (**either foreign or domestic**) borrow dollars here and send them abroad to build plants or make investments. An accelerating balance of payments deficit may force a series of official and de facto dollar devaluations. This fuels inflation because the now cheaper American products will be in higher demand on the world markets. In other words, the stabilizing domestic monetary (but also fiscal) policies are restricted by their effects on the balance of payments.

An industrial society experiences an increasing demand for more skilled and well-educated workers. But new entries into the labor force consist of a growing percentage of unskilled, poorly educated teen-agers and women, and a large number of those whose job skills have become obsolescent through technological advances.

The highly skilled and well-educated maintain employment levels even in times of recession. The unskilled and poorly educated, on the other hand, often find it difficult to obtain employment even in prosperous times because of a declining demand for their labor. An increase in aggregate demand does not necessarily create the kinds of jobs for which the unskilled are suited.

UNEMPLOYMENT

[Problem 20]

What are frictional. structural and cyclical unemployment?

Solutions: Frictional unemployment occurs as workers change jobs . Structural unemployment occurs when workers become unemployed because the industry is replacing workers by machines or reducing the number of employees because of an increase in the efficiency of use of labor. Economists consider frictional and structural unemployment to be more or less unavoidable since workers are free to choose employment and to courage's technological advancement.

Cyclical unemployment occurs when the economy is for some reason producing at a lower level than that desired by society. The economy in general does not have jobs for all those who are able and willing to work because aggregate demand is deficient ؛cyclical unemployment occurs in the recession phase of the business cycle.

[Problem 21]

Differentiate between apparent unemployment and disguised unemployment or underemployment.

Solution: Apparent unemployment) **or. simply, unemployment** (is the situation wherein a worker is involuntarily out of work.

On the other hand, discussed unemployment or underemployment is the case wherein the worker may have a job but in a sense still not be

employed to the limits of his capability. For example, a lawyer who is employed as a court reporter is considered to be **partially unemployed**. The lawyer here has a job, but he is not being employed efficiently.

[Problem 22]

Classify unemployment based on its cause. Describe and given examples for each. Which of the three do you think is the most desirable?

Solutions :The three classifications of unemployment based on its cause are as follows:

(1) **Frictional unemployment**.

(2) **Structural unemployment**.

(3) **Cyclical unemployment**.

Frictional unemployment results when given the freedom of occupational choice, at any point in time, some workers will be "**between jobs**". That is, some workers will be in the process of voluntarily switching jobs. Others will have job connections, but will be temporarily laid off because of seasonality or adversive environmental conditions (**for example bad weather in the construction industry**) or model changeovers (**as in the a automobile industry**). This will include also young people who will be looking for their first jobs, and enter the labor force for the first time.

Structural employment is brought about when important changes occur over time in the structure of consumer demand and technology, which in turn alter the structure or the composition of the total demand for labor. Unemployment results because the composition of the labor force does not respond quickly or completely to the new structure of the labor demand. As a consequence, some workers find that they have no readily marketable talents; their skills and experience have been rendered obsolete and unwanted by changes in technology and consumer ????? Examples: Years ago, highly skilled glassblowers were thrown out of ????? by the invention of bottle making machines. More recently, unskilled and inadequately educated blacks have been dislodged from agriculture in the South as a result of the mechanization of agriculture. Because of this, many of the workers have migrated to the of northern cities and have suffered prolonged unemployment because of insufficient skills.

By cyclical unemployment we mean unemployment caused by the business cycle, that is, by a deficiency of aggregate or total demand. Unemployment increases when the overall level of business activity decreases. Conversely, as business activity increases, unemployment declines. An example for this cyclical unemployment would be the Great Depression in 1933 which reached about 25 percent of the labor force.

Of the three, frictional unemployment is regarded to be as inevitable and, at least in part, desirable. It is considered to be desirable because workers typically move from low-paying, low-productivity jobs to higher-paying, higher-productivity positions. This means more income for the

workers and a better allocation of labor resources — and therefore, a larger real output — for the economy as a whole.

[Problem 23]

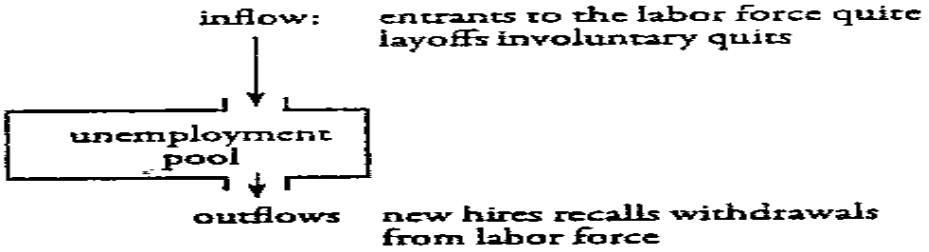
What are the differences frictional, seasonal, and technological unemployment?

Solutions: All three types contribute for the situation with less than full employment. Frictional unemployment results from constant labor turnover. Since people are free to switch jobs, there is always a small percentage of the work force that are searching for jobs and thus not employed. Seasonal unemployment means a reduction of jobs due to diminished activities is some industries at certain times of the year like in the building industry or agriculture. Technological unemployment is caused by innovation and advancement in machinery which replaces human workers. This causes the labor-capital ratio to decrease, i.e.. the labor intensity of the production process is reduced.

[Problem 24]

What is natural unemployment and what are its determinants?

Solutions :The natural rate of unemployment is that rate of unemployment at which flows in and out of unemployment just balance, and at which expectations of firms and workers as to the behavior of prices and wages are correct, **see Figure**



The determinants of the natural rate of unemployment are grouped under the duration and frequency of unemployment .

The duration of unemployment is the average period of time to find and accept a job, after entry into the pool of unemployed. It depends on:

(l) The organization of the labor market, its informational structure, in regard to the presence or absence of employment agencies, youth employment services, etc.;

(2) The demographic make-up of the labor force (**males vs, females; whites vs, non-whites; various age groups**);

(3) The ability and desire of the unemployed to keep looking for a better job; and

(4) The availability and type of jobs.

The two basic determinants of the frequency of unemployment are:

(1) The variability of demand for labor across different firms in the economy: some firms are growing and some are contracting. The higher this variability, the higher the natural unemployment rate will be.

(2) The rate at which new workers enter the labor force: the faster the growth of the labor force, the higher the natural unemployment rate will be.

All of these determinants may change; therefore, the natural rate of unemployment is not a constant over time. Because the natural rate of unemployment is primarily determined by institutional arrangements and not by aggregate demand, it is considered to be the rate corresponding to **'full'** employment.

The natural rate of unemployment is presently considered to be 5.5%.

[Problem 25]

Is an increase in national income equivalent to an increase in employment?

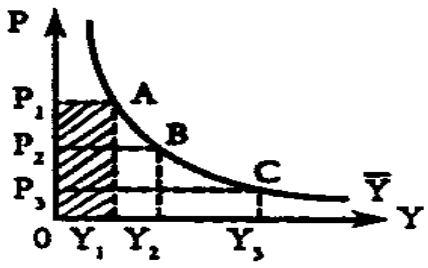


Fig. 1

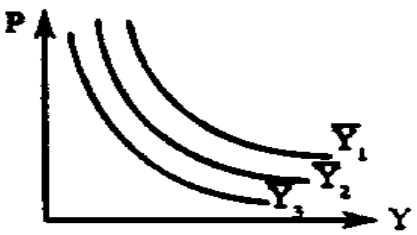


Fig. 2

Solutions :Every increase in national income does not necessarily result in an increase of employment. National income Y is the product of the general price level P and the real income y. thus Y = P × y .Therefore, a higher national income Y represents either a larger real income y or higher prices P. or combination of both .The hyperbola in Fig (1) represents a fixed level $\bar{Y}$ of nominal national income ؛a higher price

level is accompanied by a lower level of real income y and vice versa .

The area of quadrangle OP_1Ay_1 = OP_2By_2 = OP_3Cy_3= $\bar{Y}$ does not change And $\bar{Y}_1 > \bar{Y}_2 > \bar{Y}_3$ (**see Fib 2.**)

Why does the increase of national income sometimes represent a pure price increase (**inflation**)**?** For example, when real output y is at the full employment level, and employment cannot be further increased due to an inadequate supply of labor, a stimulus to increase the national income will result in inflation: when Y goes up, and y = constant, P goes up

[Problem 26]

On average every person in the U.S.A is unemployment once per 2 years, and the average duration of unemployment is 7 weeks, Given these data, what do you expect the unemployment rate to be? And what does it indicate?

Solutions: The unemployment rate = duration × frequency. The average duration of unemployment, or the average length of the period that a person is unemployed is $7/52 = 0.135$ year. The average frequency with which a person s unemployed is $1/2 = 0.5$ tines per year. Thus the unemployment rate u is expected to be u = $0.135 \times 0.5 = 6.75\%$. The unemployment rate is defined as the ratio of the total number of unemployed to the total labor force

$$u = \frac{total\ number\ of\ unemployed}{total\ labor\ force}$$

[Problem 27]

When the natural (= Full) unemployment rate $\bar{u}$ = 6%. and the actual unemployment rate. U = 9%. how much loss of output does the economy suffer? And what is necessary to create full employment?

Assume that the potential output of the economy is $1600 billion, and the marginal propensity to save s = 10%.

Solutions: This question relates to Okun's law which states. $GNP_{gap} = 3(u - \bar{u})$. Okun's Law is an empirical relationship found by Arthur Okun. former chairman of the Council of Economic Advisors, that was used by the Kennedy and Johnson administrations as a basis for economic policy. It states that for every 1% actual unemployment above the natural rate of natural unemployment there is a 3 percent GNP_{gap}.

The GNP_{gap} is the percentage shortfall of actual output Y from the full–employment = potential output Y_F . so

$$GNP_{gap} = \frac{Y_F - Y}{Y_F}$$

Given the data the GNP_{gap} $3(9 - 6) = 9\%$ of the potential output, which is $Y_F = \$1600$ billion. Thus the loss of output $Y_F - Y = 0.09Y_F = 0.09 \times 1600 = 144$ billion dollars. In order to create **'full'** employment, $u = \bar{u}$. we must reduce the GNPgas to zero, and bring the actual output up to potential output, so $\Delta Y = Y_F - Y$. The Kennedy and Johnson administrations applied the New Economics as founded on the teaching

of John Maynard Keynes, (**see the chapter on the simple multiplier theory**).

When we want to increase actual GNP by $\$144$ billion, spending by households, business and government should be increased by much less thanks to the multiplier effect.

The multiplier has the value of

$$\frac{1}{S} = \frac{1}{0.1} = 10$$

Thus households and business should be induced to spend more on consumption and investment, by i) lowering the taxes, ii) through an increased in the money supply, lowering the interest rates, and iii) an increase in the budget deficit.

$$\Delta Y = 144 = \frac{1}{S}(\Delta C + \Delta I + \Delta G)$$

$$= 10(\Delta C + \Delta I + \Delta G)$$

The total spending should therefore increase by $\Delta C + \Delta I + \Delta G = \frac{144}{10} = \$14.4$

[Problem 28]

When GNP grows by 3.5% the labor productivity by 1.6% and the labor force by 2.2% per years, is unemployment increasing or decreasing?

Solutions :The short term output is given by $Y = qh(1-\bar{u})\ \bar{N}$ where Y is GNP, q the labor productivity, h the average number of hours worked, u

the actual unemployment rate, and $\bar{N}$ is the labor force

When we turn this relationship among levels into a relationship among growth rates we get the sum

$$g_y = g_q + g_h = g_{1-u} + g_N$$

Where g means growth rate. The average number of hours worked per week is relatively constant (**say 40 hours per week**), so $g_h = 0$. The other growth rates are given

$$3.5 = 1.6 + g_{1-u} + 2.2$$

$$= 3.8 + g_{1-u}$$

We find that g_{1-u} .the growth rate of employment is negative, $g_{1-u} = -0.7\%$ Employment decreases, and thus unemployment, if it already exists, is increasing.

[Problem 29]

Assume there are only 5 kinds of labor in the economy, engineers, secretaries' truckers, steel workers and farm workers. It is impossible to move from one category to another without several years of training. Suppose that in each category there are 1.000.000 people unemployed (thus in total there are 5.000.000 people unemployed), and each increase of $1 billion in GNP causes an increase of 20.000 in the demand for engineer, 30.000 for secretaries, 25.000 for truckers, 15.000 for steel workers, and 5.000 in the demand for farm workers.

1) by how much must GNP be increased to remove all unemployment?

2) if GNP is increased to remove all unemployment, from which source would you anticipate inflationary pressure?

Solutions :The category with the slowest reduction in unemployment when GNP is increased, is the category which determines by how much GNP must be increased to remove all unemployment.

The category with the fastest reduction in unemployment indicates from which source inflationary pressure may be anticipated .We will show this for the secretaries and engineers only, and then develop the total solution .This is a problem of structural unemployment and inflation, and is based on the assumption of fixed labor input ratios in the production process .For example, the labor input ratio of engineers in the total economy is:

$$\left(\frac{\Delta L}{\Delta Y}\right)_E = \frac{20.000}{1\ billion}$$

i.e.. every increase in GNP of 1 billion is accompanied by an increase in the demand for engineer of 20.000.

To eliminate the total number of unemployment engineers of $1.000.000$. we must increase GNP by

$$\Delta Y = L_E \times \left(\frac{\Delta Y}{\Delta L}\right)_E$$

So by the product of the engineering labor available and the reciprocal of the labor input ration, called the (marginal) output/ labor ration. Thus in this case we must increase GNP by

$$\Delta Y = 1.000.000 \times \frac{1}{20.000} = \$50 \text{ billion.}$$

To eliminate completely the unemployment of engineers.

To eliminate the unemployment of secretaries. however, we have to increase GNP by only

$$\Delta Y = L_S \times \left(\frac{\Delta Y}{\Delta L}\right)_S = 1{,}000{,}000 \times \frac{1}{30{,}000} = \$33{,}33 \text{ billion,}$$

so by $\$16{,}66$ less. The reason is, of course, that the labor input ratio of the secretaries is higher, i.e.. each increase of GNP of $\$1$ billion employs $10.000\ (= 30.000 - 20.000)$ more secretaries than engineers. The unemployment of engineers is more slowly reduced by an increase in GNP than the unemployment of secretaries. We can make the above calculations for all five categories, to see how much GNP must be increased to wipe out unemployment in each category. The results are displayed in the following table.

Table 1	Engineers	Secretaries	Truckers	Steel Workers	Farm Workers
increase in GNP to eliminate structural unemployment (in $billion)	50	33.33	40	66.66	200

From this table it is clear that the unemployment of the farm workers forms the real stumbling block: to eliminate this unemployment GNP is required to be increased by $\$200$ billion. So, when GNP is increased by $\$200$ billion, not only are all the farm workers employed, but also all the steel workers, engineers, truckers and secretaries. However, because these other employment categories required less increase in GNP to close the GNP gap, in all these categories inflationary pressure results. The fiercest inflationary pressure will result from the secretaries. Why?

When GNP is increased by $\$200$ billion and assuming fixed labor input ratios, the demand for secretaries will increase by

$$\Delta L_s = \Delta Y \times \left(\frac{\Delta L}{\Delta Y}\right)_s$$

$$= 200 \times 30.000 = 6.000.000 \text{ persons.}$$

In the labor market there will be an excess demand of $6.000.000 - 1.000.000 = 5.000.000$ secretaries. And employers will start to offer

higher salaries to attract the scarcely available secretaries, thereby increasing the costs of production. This cost-push will be reflected in higher prices for goods and services, reducing the purchasing power of the dollar, i.e.. reducing the real value of salaries and wages. This will also trigger off demands for higher wages and salaries in the neighboring sectors and the inflationary pressure spreads as quickly as a drop of oil on a water surface.

The inflationary pressure will also be felt in the other labor categories where excess demand appears. See the following table where is constructed using the expression.

Table 2-1	**Engineers**	**Secretaries**	**Truckers**	**Steel Workers**	**Farm Workers**
$\Delta L_i - U_i$ Excess demand in category I resulting from ΔY= $200 $billion)	3.000.000	5.000.000	4.000.000	2.000.000	0

$$\Delta L_i - U_i = \Delta Y \times \left(\frac{\Delta L}{\Delta Y}\right) - U_i$$

$$200 \times \left(\frac{\Delta L}{\Delta Y}\right)_i - 1.000.000$$

Where ΔL_i is the increase in the demand for labor in category i. **(i — engineers, secretaries, truckers, steel and firm workers);** $(\Delta L/\Delta Y)_i$ is the **(marginal)** labor-input ratio for labor category i; U_i is the unemployment experienced in labor category i; and ΔY is the particular increase in GNP that is investigated; in this case ΔY is the increase of $\$200$ billion that eliminates the unemployment of the farm workers. This calculatory example is rather extreme, but it shows that if the labor-input ratios are rather fixed, for example, inconsequence of salaries and wages, there is always a trade-off situation between unemployment and inflation on the aggregate macro-level. If we employ all the secretaries, requiring an increase in GNP of $\$33.00$ billion, there will still be $1.000.000 — (33.00 \quad 20.000) = 333.333$ engineers. $1.000.000 — (33.00 \quad 25.000) = 166.750$ truckers. 500.050 steelworkers and 833.350 firm workers unemployed. Conversely, is we employ all the farm worker, requiring, as we have seen, an increase in GNP by $\$200$ billion, a tremendous inflationary pressure is induced in all the other labor categories. The 'normal' situation, under the influence of the parties lobbying Congress, will be that GNP will be increased somewhere in between $\$33.33$ and $\$200$ billion, say $\$50$ billion. The resulting situation is indicated in the next table, which can be

Table 3-1	Engineers	Secretaries	Truckers	Steel Workers	Farm Workers
Inflationary labor gap Unemployment	0	500.000	250.000	25.000	750.000

Derived now easily using the preceding discussion. There is some inflationary pressure (**secretaries**, **truckers**), some unemployment (**steel workers**, **farm workers**) and in one category the labor market is in equilibrium.

The decision, how much inflation and unemployment, and where the brunt of each of them is allocated, is a political decision.

[Problem 30]

For every $5 billion output, manufacturing requires $2 billion inputs from primary production and 300.000 workers in manufacturing. Primary production requires no other inputs, but needs 200.000 workers for every $1 billion of primary output suppose the regional economy consists of only these two sectors, manufacturing and primary production. What will the total increase in unemployment by if a recession causes manufacturing output to fall by $50 billion?

Solutions: The labor input ratio in the manufacturing industry is

$$\frac{L_m}{Y_m} = \frac{300.000}{5\ billion} = 0.06$$

and the primary product input ratio in the manufacturing industry is

$$\frac{Y_P}{Y_m} = \frac{2\ billion}{5\ billion}$$

While the labor input ratio in the primary production sector is much higher

$$\frac{L_P}{Y_P} = \frac{200.000}{1\ billion}$$

There are no additional inputs in the primary production industry, the reduction of manufacturing output of $\Delta \boldsymbol{Y_m}$ = $\$50$ billion causes a reduction in employment in the manufacturing industry by

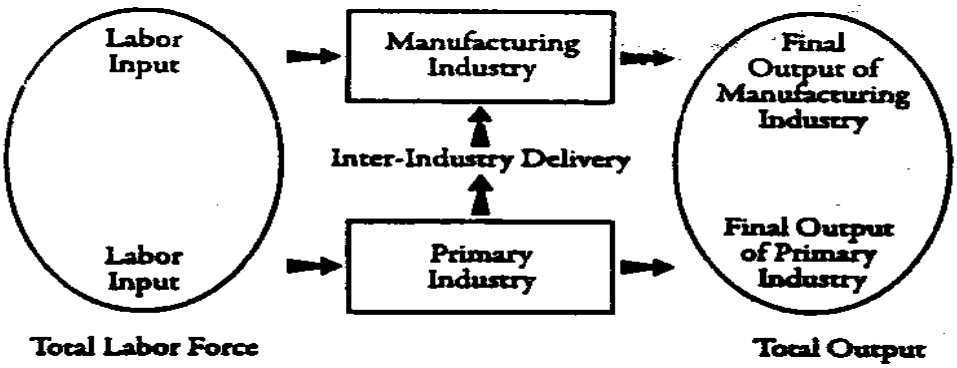
$$\Delta Y_m \times \frac{L_m}{Y_m} = 50\text{billion} \times \frac{300.000}{5\ billlion} = 3\ billion\ workers$$

But it also causes a demand for primary output products of

$$\Delta Y_m \times \frac{Y_P}{Y_m} = 50 \times \frac{2}{5} = 20\ billion$$

This reduction in the output of the primary production industry also causes reduction in the employment in this industry. The reduction en employment of the primary production workers is

$$\Delta Y_P \times \frac{L_P}{Y_P} = 20\ \text{billion} \times \frac{200.000}{1\ billlion} = 4\ \ million\ workers$$



Thus the recession causes unemployment to increase by the unemployment increase in the manufacturing industry plus the unemployment increase in the primary production industry, that is by 3 + 4 =7 million workers. The interconnections become clear in the diagram.

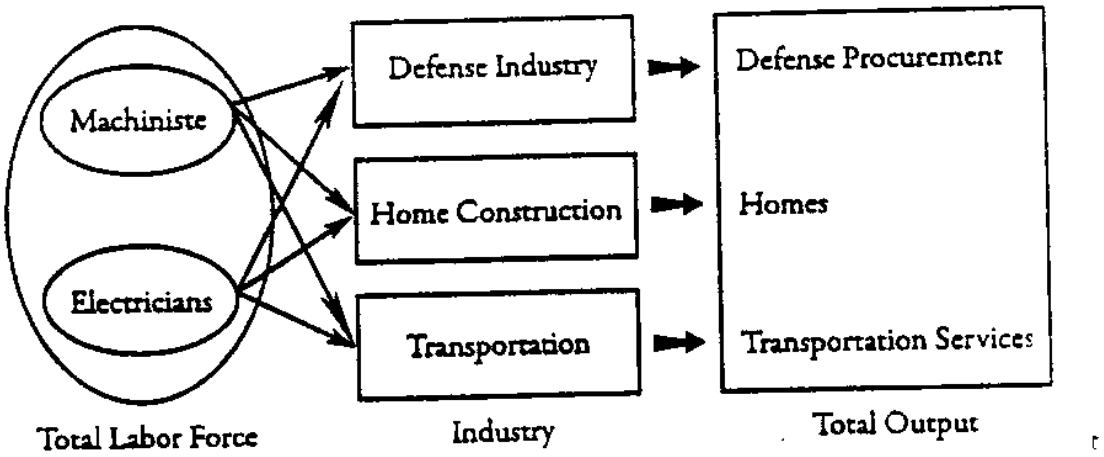
[Problem 31]

Suppose there are three industrial sectors in the economy, defense production, home construction and transportation, and only two categories of worker, machinists and electricians. Assume that it takes a long time and much investment in retraining programs before one category of workers can do the work of the other category.

Defense production needs 30.000 machinists and 50.000 electricians for every $1 billion output, home construction nedd 20.000 machinists and 70.000 electricians per $1 billion of output. and transport needs 60.000 machinists and 30.000 electricians per $1 billion of output.

If the defense production is cut by $40 billion because of a reduced involvement in war, by how much should home construction and transport be increased to insures as low as possible unemployment of either type of worker.

Solutions :We trace first the logistic interconnections between the output and the employment with the help of a diagram:



We calculate first the labor input ratios to see how reductions and increase in output employment.

The labor–input ratio in the defense industry is

$$\frac{L_m^D}{D^r} = \frac{30.000}{1\ billion}$$

For machinists, and

$$\frac{L_m^D}{D^r} = \frac{50.000}{1\ billion}$$

For electricians, respectively, the labor–input ratios in the home construction industry are

$$\frac{L_E^H}{Y^H} = \frac{20.000}{1\ billion}$$

For machinists, and

$$\frac{L_E^H}{Y^H} = \frac{70.000}{1\ billion}$$

For electricians, respectively, And. finally, the labor ratios for transport are

$$\frac{L_m^T}{Y^T} = \frac{60.000}{1\ billion}$$

For machinists, and

$$\frac{L_E^T}{Y^T} = \frac{30.000}{1\ billion}$$

For electricians, respectively.

If the defense constructions is cut by and $\Delta Y = \$40$ billion, then

$\Delta Y^D \times \frac{L_m^D}{Y^D} = 40 \times 30.000 = 1.200.000$ machinists and

$\Delta Y^D \times \frac{L_E^D}{Y^D} = 40 \times 50.000 = 2.000.000$

Electricians lose their jobs in the defense industry. the government tries to place them in the home construction industry by increasing the demand for homes through providing cheap loans, and by investing in public transportations. The question is by how much must the output of homes and of transport be increased to absorb the $1.200.000$ unemployed machinists and the $2.000.000$ unemployed electricians?

Of course we look at the labor intensities of each of the two industries, home construction and transport, for the respective labor categories.

The more labor intensive an industry, i.e.. the higher its labor–input ratio, the more workers will become employed by every dollar of increased output. Let us compared the labor input ratio of both industries:

(Per $1 billion)	Machinists	Electricians
Home construction	20.000	70.000
transport	60.000	30.000

It appears from this tabulation that transport is more labor intensive for machinists, and home construction for electricians.

We can now set up the following inequalities. The total labor absorption of machinists is the labor absorption in home construction plus the labor absorption in transport:

$$\Delta Y^H \times \frac{L_m^H}{Y^H} + \Delta Y^H \times \frac{L_m^T}{Y^T} = \Delta Y^H . 20.000 + \Delta Y^T . 60.000 \leq 1.200.000$$

The labor absorption of machinists must be smaller or equal (**preferably equal**) to the unemployed machinists. The same type of inequality holds for the electricians.

$$\Delta Y^H \times \frac{L_E^H}{Y^H} + \Delta Y^T \times \frac{L_E^T}{Y^T} = \Delta Y^H . 70.000 + \Delta Y^T . 30.000 \leq 2.000.000$$

We have to determine the mix of home-construction/ transportation output necessary to absorb all unemployed workers. This means that we have to solve the system to two simultaneous equations:

$$2\Delta Y^H + 6\Delta Y^T = 120$$

$$7\Delta Y^H + 3\Delta Y^T = 200$$

For the two unknowns: ΔY^H and ΔY^T , the increases in output of the home construction and transport industry, respectively. We divided by a factor of 10.000 to simplify the notation.

Divide the first equation by 2

$$\Delta Y^H + 3\Delta Y^T = 60$$

and subtract this form the second equation to obtain

$$6\Delta Y^H + 0 = 140$$

Thus the increase in the home construction must be

$$\Delta Y^H \times \frac{140}{6} = 23.33$$

Billon dollars, From the preceding relationship

$$\Delta Y^H + 3\Delta Y^T = 60$$

We can then easily derive, by substitution

$$23.23+3\Delta Y^T = 60$$

Or $$3\Delta Y^T = 60 - 23.33 = 36.67$$

Dividing by 3.

$\Delta Y^T = 12.22$ billion dollars.

Thus the output of the home construction industry must increase by $\$23.33$ billion dollars, and the output of the transport industry by $\$ 12.22$ billion dollars to absorb all the machinists and electricians who lost their job because of the cut in defense expenditure by $\$40$ billion.

INFLATION AND INTEREST RATES

[Problem 32]

What would the money rate of interest have to be at an inflation rate of 6% to induce people to hold the same proportion of their assets in the form of monney as they would with stable prices. if the real rate of interest was 5% and was not affected by the inflation?

Solutions: The money rate of interest i equals the sum of the real rate of interest r and the inflation rate.

$$i = r + \pi$$

$$= 0.05 + 0.06 = 0.11$$

[Problem 33]

What is the consequence of permanent inflation for the interest rates?

Solutions :What inflation is permanent and relatively steady it becomes anticipated an interest rates become discounted by the anticipated rate of inflation ؛nominal interest rate = real interest rate + inflation

$$i = r + \pi$$

For example: inflation is 9% and the nominal rate is11% then the real rate of interest is $r = i - \pi = 11 - 9 = 2\%$

[Problem 34]

Suppose that the trade-unions are strong enough to bargain a 5% increase in nominal wages. How much do you expect the prices will rise? In the U.S. A productivity increases on average of 2% per year. How are the workers better off?

Solutions: Inflation is induced there by a increase in the labor costs; it will be a form of cost-push inflation.

We assume that the employers will leave their profit share unchanged at the conventional level. Thus the cost increase will be directly reflected in the product prices. The productivity is supposed to increase by 2%; this means a relative cost reduction of 2%. Thus the prices are expected to rise by

$$\pi = 5 - 2 = 3\%$$

The nominal wage increase consists of the real wage increase and the increase in the general price level = inflation rate. What counts for the worker is how much he can purchase for this money, i.e.. his real wage. His real wage increase is

$$5 - 3 = 2\%$$

The real wage increase equals the productivity increase.

[Problem 35]

What is the Gibson paradox, and why is it called a paradox?

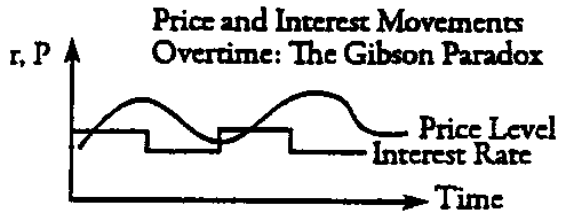


Fig. 1

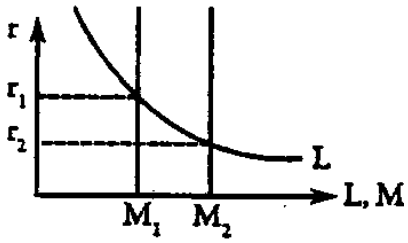


Fig. 2

Solutions: The Gibson Paradox observes that when prices rise. interest ratios rise and vice versa) See Fig .(1It is called paradox because it contradicts the Classical Theory which states that an increase in the money supply would cause prices to rise and interest rates to fall : Looking at the money exchange equation MV = P**Q** this becomes more transparent. We notice that, if the velocity V of the money rum-over, i.e. the number of times that money changes hands in transactions, remains constant, and also level P must increase .This can be explained by the portfolio adjustment theory :money balances arc too high, bidding up the prices .

But an increased money supply lowers the interest rate in the financial market (See: Fig, 2.) When the money supply M_1 increases to M_2. the interest are r drops from r_1 to r_2 along the money demand, i.e.. Liquidity Preference, schedule

The Gibson Paradox can be reconciled with classical theory by introducing time lags: the drop in the interest rate takes place immediately but the price increase is delayed so that the interest rate is

already increased again when prices actually start to rise. And it can also be reconciled by acknowledging the difference between nominal and real interest rates.

The nominal interest rate i is the sum of the real interest rate r and inflation π : i = r + . When the nominal rate i drops it may be cawed by a drop in the real interest rate r. or by a drop in the rate of inflation.

[Problem 36]

What is the Gibson paradox and why is it called a paradox?

Solutions :The real rate represents the opportunity cost of holding cash; cash does not earn interest. Solutions; The real cost of holding cash is equal to the rate of inflation times the cash hold .if there is no alternative. But this cash may be invested in bonds and earn a nominal interest. The opportunity cost of not investing the cash in bonds is the nominal interest minus the cost inflation, which gives us the real interest.

[Problem 37]

Suppose we have a bond that sells for $1.000. The annual interest paid is $80. However, the money authorities have predicted that the general price level will increase next year by 5 percent. Given these facts, compute the:

a) Nominal interest rate

b) real interest rate

Solutions :a) The nominal interest rate is the rate that is actually paid and is computed as follows :

Amount of the interest paid ÷ Amount of the bonds = $\frac{\$80}{\$1.000}$ = 8 percent per year.

b) The real interest rate is one that expresses the real return on lending money, taking into account expectations about the future rate of inflation. Since it is predicted that the general price level will increase next year by 5 percent, that means the real value of the $1.000 is expected to decline over the year by

$1.000 × 5% = $50

To calculate the real interest rate that will be earned. the $50 will be deducted from the $80 interest payment. This indicates a real gain of only $30 on the $1.000 bond – or a real interest rate of only

$30 + $1.000 = 3 percent

We notice from these calculations that the nominal interest rate i is the sum of the real interest rate r and the rate of inflation, thus

$i = r + \pi$

[Problem 38]

Suppose that the interest rates has risen from *% to 10% over a three year period while inflation has risen from 3% to 5%. What has happened to the real interest rate.

Solutions: Whenever examining interest rates, we must realize that the "real interest rate" is equal to the "money interest rate" minus "the percentage price rise". Using the inflation rate above as an indicator of the percentage price rise, we see that at the beginning of the three-year period, the real interest rate = 8% - 3% = 5%. At the end of the three-year period, real interest =10% - 5% = 5%. Therefore. when prices are rising, money interest rate must rise in order to keep real interest rate constant.

[Problem 39]

MR. Riley loaned his friend, MR. Gillis. $400 to purchase a second-hand car. One year later MR. Gillis retuned $420 to Mr Riely. During that period, the consumer price index rose by 5%.

a) What is the nominal rate of interest in this example?

b) What is the real rate of interest?

Solutions: a) The nominal, or market, rate of interest, is the actual percentage represented by the interest paid by a borrower. The reform, in this example Mr .Gillis paid $20 in interest ($40 – 400) .This represents $20 /400 = 5% nominal rate of interest

b) The real rate of interest takes inflation into account .It is defined as the nominal rate minus the rate of inflation) as represented by the consumer price index ،(In this example, prices rose by 5% .The ref ore real rate of interest = 5% − 5% = 0

THE FEDERAL RESERVE AND THE MONEY SUPPLY

[Problem 40]

How will an increase in the money supply, effectuated by the FFD through an open market operation, have the result of increasing the national income?

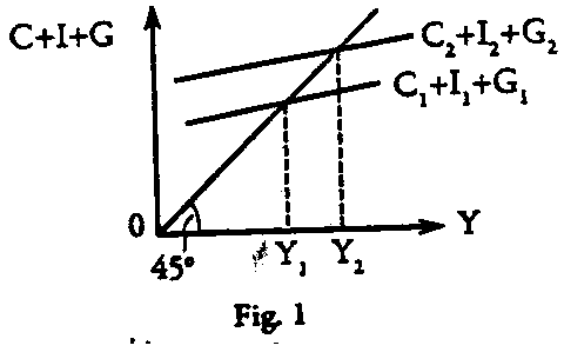


Fig. 1

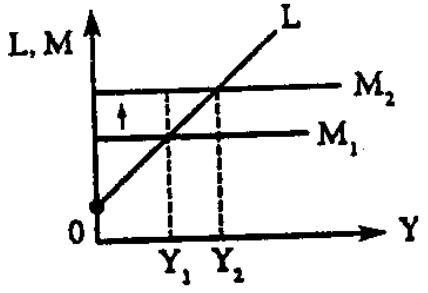


Fig. 2

Solutions :There are two coexistent explanations of this process .The Monetary Theorists rely on the portfolio adjustments, while the: Keynesian Theorists use the effects on interest rates and investment

In both theories an increase in the national income results from an increase in aggregate demand Y = C + I + G .In fig 1, the new equilibrium income Y_2 is higher than the old equilibrium income Y_1. because of an upward shift in aggregate demand from $C_1 + I_1 + G_1$ to $C_2 + I_2 + G_2$ (**see the chapter on income determination**). Most of this autonomous shift comes from an increase in investment I. and monetary policy concentrates on this component of the aggregate demand .The national income will expand by more than the autonomous increase in spending because of the multiplier effect (**see chapter on the multiplie**).

(1) The monetary theorists use of the following explanation for the connection between the increase in the money supply and the shift in autonomous spending. Suppose that the demand for money is related proportionally to income (**see Fig, 2**). L is the demand for money and M the supply of money, determined by the FED, independently of income Y. Let there be an increase in the money supply from M_1 to M_2. At income level Y_1 the supply of money is larger than the demand; people have excess money balances

They will increase their spending to reduce their money balances to the desired level; but this autonomous increase in the aggregate demand raises the level of the national income from Y_1 to Y_2. The desired levels of the money balances increase simultaneously along L. and the gap between actual and desired levels of the money balances becomes dosed by this portfolio adjustment process. The people adjust their money holding relative to the other assets they own, In case of an open market operation when the FED buys securities in exchange for money, the money holdings of banks and public are increased relative to their holdings of bonds and other assets. The increase in the bank reserves will result in a multiple expansion of their deposits (**the money-multiplier effect**). affecting further the portfolios of the public. When commercial banks receive additional reserves, say through an open market operation, they usually react by expanding their investments and loans, stimulating the investment component in the aggregate demand. The open market purchases by the FED raise the security prices and lower the interest rates. This causes a rise in bond prices inducing the

public to adjust their portfolios by selling their securities. The high bond prices tend to increase the demand for money and reduce the demand for bonds. The increased supply of money and the lower interest yields on bonds makes other assets, like corporation stock, physical capital and consumer goods relatively more attractive, and autonomous spending I + C increases, Thus the portfolio adjustment explanation of the monetarist theorists relies on the changes in the relative prices of the different assets as the principal way in which the stimulus is transmitted from the financial markets to the real sector of the economy.

2) The Keynesian theorists used the interest rate-investment theory. The liquidity preference schedule and the money supply are exhibited in Fig. 3.

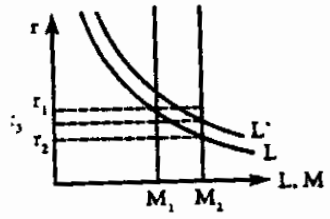


Fig. 3

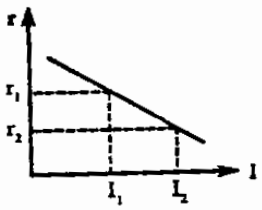


Fig. 4

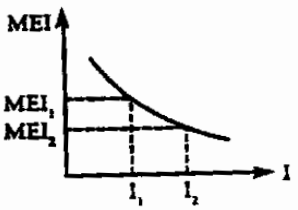


Fig. 5

An increase to fall from M_1 to M_2 causes the interest rate to fall from r_1 to r_2: the people will have excess money balances at interest rate r_1 and therefore start buying bonds. The bond prices arc bid up, and thus the yield goes down to r_2. At the lower interest rate people are willing to hold more money relative to their holdings of other assets. This decline

in the interest rate is the liquidity effect of an increase in the money supply.

The fall in the interest rates makes borrowing for business cheaper and investments will expand (**see Fig, 4**). because the cost of borrowing funds will be lower than the expected rate of return on a new investments. The expected rate of return on a new investment, is also called the marginal efficiency of investment (MEI) and is defined as the ratio

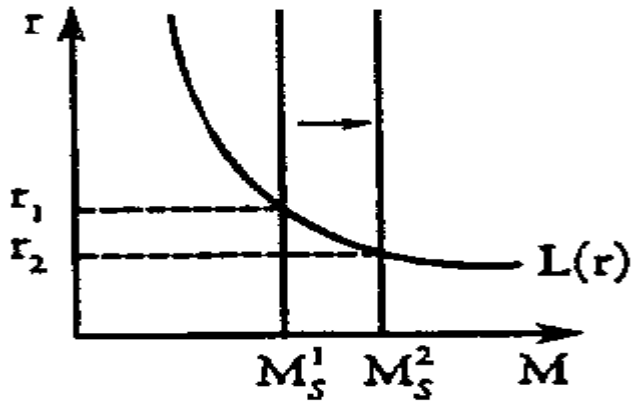
MEI $\frac{\boldsymbol{expected\ annual\ net\ return}}{\boldsymbol{cost\ of\ investment\ (machine.building.ect}}$

When the expected rate of return is higher than the interest rate, more funds will be borrowed and invested. The marginal efficiency of investment is decreasing (**see Fig. 5**) and at a certain level of investment the expected rate of return = interest rate = cost of capital and no more funds will be invested. This expansion of investment means an increase in aggregate demand moving national income upward.

This simple explanation becomes more sophisticated when was add the following: the increase in income induces an increase in the transactions demand for money. This income effect shifts the liquidity preference schedule L (**see Fig, 4**). to the right and restricts the fall in the interest rate to r_3. and therefore the increase in investment.

[Problem 41]

Does the total watch possessed by the public change when the FED increases the money supply by an open market purchases of securities?



Solutions: No. If additional money is supplied by an open market operation, the Fed buys securities from the public in exchange for cash. The public thus substitutes their holdings of bonds for holdings of cash balances. and there is no change in total wealth. As a result there is also no wealth effect on total spending.

The important effect of such an open market operation is to lower the interest rates (**see a accompanying figure**), and to raise the security prices. The money supply M_s^1 shifts to M_s^2 while the money demand schedule remains unchanged. As, a result the interest rate r drops from r_1 to r_2.

[Problem 42]

Which of the following should be Federal Reserve not during a recession:

a) Lower required reserve ratios.

b) Sell securities in the open market.

c) Reduce down payment requirements for installment buying

d) lower the discount rate

Solutions: b) Sell securities in the open market. Clearly this should not be done because such a policy move would reduce the money supply and hence reduce the aggregate demand for goods and services at the prevailing price level, further exacerbating the negative impact of the current recession on output and employment.

[Problem 43]

Suppose that real GNP doubles while the quantity of money increases by 80% if the velocity of money is co. what happens to the price level?

Solutions :From the equation of Exchange, we have

$MV = PQ$

Where M = money supply

V = velocity of money

P = Price level

Q = real GNP

We hold V fixed while M and **Q** change and we then must determine P, therefore

$$V' = V$$

$$M' = M + 80\%\ M = 1.8M$$

$$Q' = 2\mathbf{Q}$$

$$P' = P + \Delta P.$$

Where the primed symbols represent the values of the variables after ·.me increase inc eh quantity of money.

By the equation of exchange

$$M'\ V' = P'\ Q'$$

Substituting, we get

$$(1.8M)(V) = (P')\ (2Q)$$

$$1.8MV = 2P \cdot Q$$

$$P' = 0.9\ \frac{MV}{Q}\ .\ \text{but}\ \frac{MV}{Q} = P$$

$$\text{thus}\quad P' = 0.9P$$

$$\Delta P = P' - P = 0.9\ P - P = -0.10P$$

The refore the price level drops by 10%.

[Problem 44]

What are the effects of an increase in the money supply on output and on prices in the short run and in the long run?

Solutions The effect in the short run is an increase in output, and in the long run an increase in the general price level

Use the equation of exchange as frame of reference:

$MV = PQ$

Where M denotes the money supply, V the velocity of circulation, P the general price level and Q the real aggregate output, or total of business transactions in the economy. When the money supply M increases there is usually a small drop in the velocity V, but on average we are allowed to assume chat V is constant **(V is about 3.5)**, the increase in the money supply M, increases the money balances above their desired levels and people start to buy. The aggregate demand increases and the producers react by increasing their output, as long as it has not yet reached its fill-employment output.

In the long run, however, the growth of real output Q is limited by the available labor and capital supply. When Q cannot increase rapidly enough, the increase in the money supply will be reflected in a more rapid increase in the general price level P, that is, in a demand-pull inflation.

MILTON FRIEDMAN AND MONETARISM

[Problem 45]

Can you explain the two basic tenets of Monetarism?

Solutions :Monetarism emphasizes the importance of the behavior of the money stock. Solutions :M. in determining:

(1) The rate of inflation.

$$\pi \equiv \frac{\Delta P}{P}$$

In the long run, and

(2) The behavior of real GNP, Y. in the short run.

In an economy with a constant growth rate of money

$$M \equiv \frac{\Delta M}{M}$$

A constant level of output, and with full anticipation of inflation, the prices will rise exactly at the race at which the nominal money stock is increasing: π = m. Thus in a stationery economy the rate of inflation equals the growth rate of the nominal quantity of money.

How to derive this equality?

Recall the equilibrium condition in the money market: the real money supply M/P equals the real money demand L (i.Y) which is dependent on the interest rate and income, so

$$M / P = L\,(i.Y) \qquad (1)$$

(Note: this relation describes the LM −schedule in the IS−LM analysis), or

$$M = PL\,(i.Y) \qquad (2)$$

The nominal money supply equals the nominal money demand. In a stationary economy output and interest rates are constant i = $\bar{\iota}$ and Y =$\bar{Y}$: but then there is also the real money demand constant.

$$L(\bar{\iota}.\bar{Y}) = \bar{L}$$

Also, in order to maintain the equality between the supply and demand for money, changes in the nominal money supply, $\Delta M/M$, must equal changes in the price level $\Delta P/P$; so m =π , Even if we allow for constant growth of real income, the relationship between m and is fixed.

The income elasticity of the demand for change in the real money demand caused by the relative marginal change in real income:

$$\frac{\Delta L}{L} / \frac{\Delta Y}{Y}$$

For example: when the elasticity of the money demand is 0.75. we mean that a 1% increase in real income, $\Delta Y/Y = 1\%$. causes an increase in red money demand of $\Delta L / Y = 0.75\%$.

$$\frac{\Delta L}{L} / \frac{\Delta Y}{Y} = \frac{.}{1\%} = 0.75$$

Suppose that real income grows at an average rate of 3% per year, $\Delta Y/Y$. then we Know that the real money demand increases by

$$\frac{\Delta L}{L} = 0.75 \times 3\% = 2.25\%$$

Returning to relation (2). M = PL (i.Y) we notice that the growth rate of the nominal money supply equals the sum of the inflation rate and the rate of increase in the real demand for money:

$$\frac{\Delta M}{M} = \frac{\Delta P}{P} + \frac{\Delta L}{L}$$

Or $$m = \pi + \frac{\Delta L}{L}$$

Thus the inflation rate equals the rate of increase in the money supply minus the rate of increase in the real money demand: π = m - ΔL /L. With an elasticity of the money demand of

$$\frac{\Delta L}{L} / \frac{\Delta Y}{L} = 0.75.$$

This can be expressed as

$$\pi = m - 0.75 \frac{\Delta Y}{Y}$$

And we have a constant relationship between the inflation rate, the rate of money supply and the growth rate of real income, which is relatively constant in the long run, say 3%, so that π= m - 2.25. Inflation in the long run. appears to be a monetary phenomenon: it arises from growth in the nominal money supply in excess of growth in real money demand. Secondly, how is the behavior of real GNP, Y. in the short run, determined by the behavior of the money stock M? we know from the income determination theory that changes in the aggregate demand in the short run are due to change in real balances (**adjustments in portfolios to changes in the money stock**) or changes in the fiscal

policy of taxes and expenditures; and that the aggregate in supply relationship is affected by the expected rate of inflation π because it influences labor and material costs.

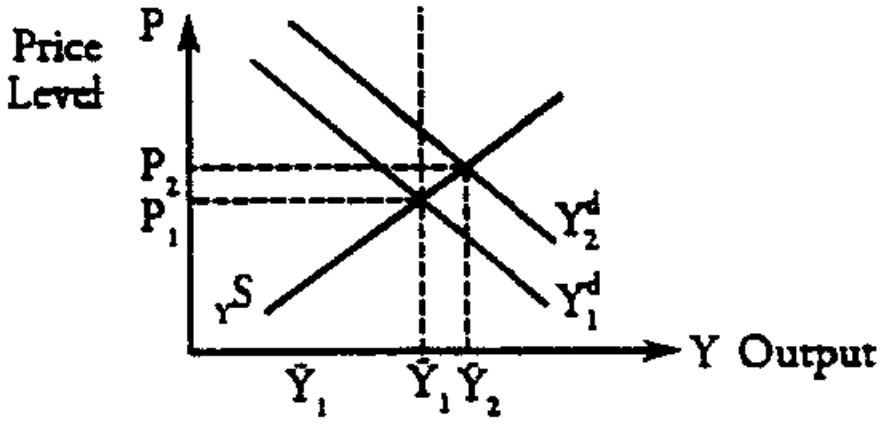


Fig. 1

What happens if the money supply M is increased? The aggregated demand schedule shifts upward (**see Fig, I**). and both real output and the price level are increased. The increase in the price level means inflation, $\Delta P / P = \pi$. But there is a short run simulative effect of an increase in the money supply on real GNP.

[Problem 46]

What is the contrary rule of Milton Friedman and why did the propose it?

Solutions :According to Professor Milton Friedman of Chicago University the monetary authorities should follow the rule that the money supply be increased at a fixed rate .

He argues that, because the behavior of the money stock is of critical importance for the behavior of real GNP) **in the short run** (and nominal GNP) **in the long run** ،(and because money operates with long often variable Lags, monetary policy should not attempt to**' fine tune '**the economy .Because of insufficient knowledge and understanding of the processes involved errors are made in forecasting and judging the time lags .Thus an active discretionary monetary policy might actually accentuate the instability of the economy .Therefore the money supply is money rule is essentially a non-activist rule: the money supply is kept growing at, say $\Delta M / M = 4\%$.

An example of an activist rule would be that the growth rate of the money supply would be increased by 2.5% per year, for every 1% unemployment in excess of the natural unemployment rate of, say, 6%. Algebraically such` a rule would be expressed as

$$\frac{\Delta M}{M} = 4.0 + 2.5\ (u-6.0)$$

Where $\Delta M / M$ = growth rate per year and u = unemployment rate. By linking the monetary growth to the unemployment rate an activist, anticyclical monetary policy is achieved, but without any discretion.

However, given that the economy and our knowledge of it are both changing overtime, there is no case for permanent rules that would tie the controls of fiscal and monetary authorities permanently, and some discretion appears to be desirable.

[Problem 47]

How can the Automatic Monetary policy of a fixed growth rate in the Money Supply as proposed by Milton Freidman have a stabilizing effect on the economy?

Solutions :As automatic policy deals, without discretionary interference, with the random disturbances to which any real economy is subjected.

Suppose the economy is below its capacity level ؛there is unemployment .The supply of money growing at a constant rate is then relatively high to the lowered level of activity .The public will consider their money balances excessive .Their desired money balances are lower, so the public will decrease their money balances by increasing their expenditures .In the aggregate the consolidated balances cannot be decreased. because the supply of goods and services does not react immediately to the increase in spending: first the inventories will be run down .But eventually there will be an upward pressure on real output too .The existing unemployment keeps wage increases moderate. The rapidly rising prices and the slowly increasing wages makes the expansion of (**real**) output profitable for business .Initially, as an additional effect, the excess money supply depresses the interest rates, and these encourage investments .All these effects are directed towards an expansion of real output.

Suppose now, in a different case, that an external disturbance, for example, a raw-materials-cost-price-shock (**oil**) has caused prices to rise at **'full employment'**, Nominal incomes will increase with the price

level, because of wage and salary demands, but the money balances will only grow as fast as real output does. Thus the money balances will become low relative to the income levels and expenditures, and people will cut down their expenditures to build up their balances. The lower than desired money supply causes the interest rates to increase, discouraging investments. In this way the effects are all directed towards a contraction, because the money stock is growing at a constant rate.

[Problem 48]

How would Monetarists stabilize the fluctuations of the economy?

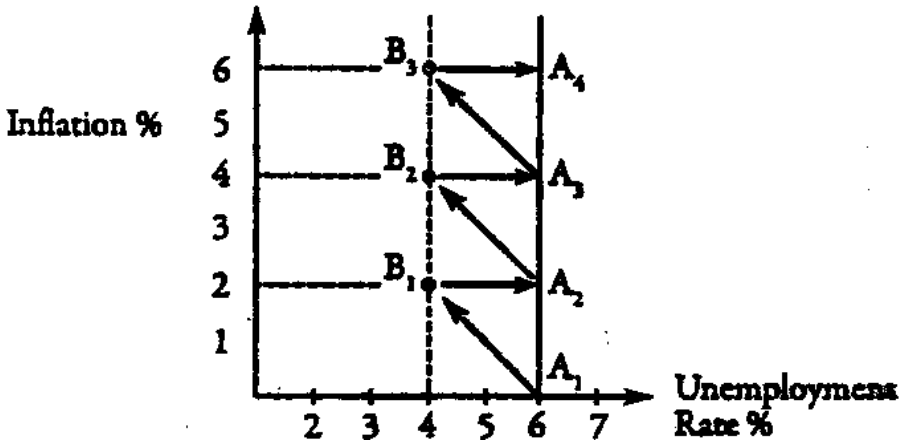
Solutions :Monetarists believe that changes in the growth rate of the quantity of money are responsible for changes in the level of economic activity. The supply of money effects interest rates, which in turn affects investment .So, the key to stabilizing economic fluctuations is stabilizing the growth rate of the quantity of money.

Monetarists generally do not recommend trying to counter fluctuations in the level of business activity by varying the growth rate of the money supply .They feel that the effects of monetary policy are too unpredictable to use against specific disturbances in the economy. So, Monetarists would stabilize the fluctuations of the economy by stabilizing the growth rate of the money supply.

[Problem 49]

Some monetarists, like Milton Friedman contend that the Phillips curve does not exist as a stable, long-run Phenomenon. These accelerations conclude that Keynesian full-employment policies, basis on the incorrect assumption that the Phillips curve does exist, will result in an accelerating rate of inflation. Can you explain this accelerationist theory?

Solutions :We use the accompanying figure in our explanation.



Suppose that the natural, or **'full-employment'** rate of unemployment is higher than believed. Suppose, it is 6% (**point A, in the figure**) rather than 4%. The government, obliged to steer the economy towards full employment by the Employment Act of 1946. believes that the **'full-employment'** rate of unemployment is 4%, and regards 6% unemployment as economically and politically intolerable. In invokes therefore expansionary fiscal and monetary policies. The resulting; increase in demand pulls up the price level, and, given the level of money wages, business profits increase. The money expenses remain constant, but the sales revenues increase because of the price increase.

Firms respond to expanded profits by increasing output, and hire additional workers. The economy moves from point A_1 to point B_1. Th is move is consistent with the Keynesian conception of the Phillips curve. Some higher inflation is traded for a reduction in unemployment.

The accelerations contend. However, that point B_1 is not a. stable equilibrium position. The workers will recognize that their real wages and incomes have fallen, because their money incomes didn't rise when the level of product prices has increased. The workers will demand, and receive, a money wage increase to restore the purchasing power they have lost. But when the money wages are raised, with constant sales revenues, business profits will be reduced to their earlier level. And the motivation of businesses to increase output and employment will be eroded. Unemployment will return to its true **'natural'** rate of unemployment of 6%. The economy moves from point to point B_1 to point A_2. But the economy experiences as a result of these two process a higher rate of inflation, here 2%. The effectual shift is from point B_1 to point A_2, point AS. The sift from A_1 to B_1 was only a **'short-run'**, transient phenomenon. In the **'long-run'** unemployment returns to its 'natural rate'.

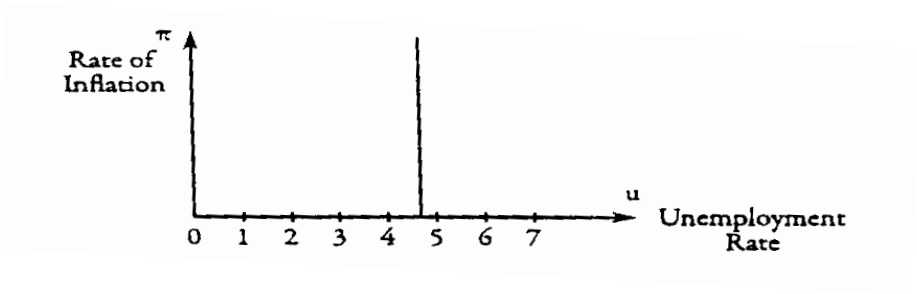
The process may now be repeated. A frustrated government will try again to expand the economy. Aggregate demand increases, prices rise, money wages remain temporarily constant, profits increase, output increases, and employment rises, the economy moves to B_2 .But the workers will catch up; raise their money wages; the profits increase will be eroded, employment falls; and the economy moves to A_3 ; etc. so,

say the accelerationists, the expansionary policies of the government move the **'short-term'** Phillips curve upward, from A_1 B_1 to A_2 B_2 , to A_3 B_3 to more unfavorable positions.

Secondly, the 'long-run' Phillips curve is vertical: the economy always gravitates back to the **'natural rate'** of unemployment. And in the long-run there is no constant rate of inflation. Each rate of inflation is compatible with the same **'natural rate'** of unemployment. However, this explanation is based on the assumption that increases in money wages lag behind the increases in the price level. If the workers anticipate inflation and build this expectation into their wage demands. then even the temporary increases in profits, output and employment will not occur. The movement will be directly from A_1 to A_2 . Fully anticipated inflation by labor means there will be no short-run decline in unemployment. The implication is that Keynesian measures to achieve a (**misspecified**) full-employment rate of unemployment will generate an accelerating rate of inflation, not a lower rate of unemployment.

[Problem 50]

How did the monetarists. using the anticipated inflation-theory, project the Philips-curve, and why?



Solutions: The Monetarists claim that the current Phillips-curve is essentially vertical (**see accompanying figure**).

When an economy experiences a steady rate of inflation for a longer period, inflation becomes anticipated .And workers, expecting that their wage increases will be eroded, will bargain for nominal wage increases with the expected inflation in mind .Workers will not only ask for wage increases that will compensate them for current productivity gains and past inflations, but also for the price increases they expect .As a result, inflation will be accelerated .The accelerating rate of inflation is not due to an increasingly tight employment situation, but rather to expectations of future inflation .A trade-off between inflation and employment no longer exists and the Phillips curve will be a vertical line .The line can be thought of as the natural rate of unemployment .i.e.**'.full employment '**given the structure of the economy.

QUESTIONS FOR REVIEW

Choose the correct answer:

1. By "cost-push (or sellers') inflation", economists are referring to: (a) attempts by labor and industry to set prices and wages that will give them together more than 100 per cent of the available product (b) rising prices due to excessive levels of government spending financed by open-market operations through the Fed (c) rising prices due to excessive levels of aggregate demand (d) the rise in total sales revenue attributable to price-tag changes rather than to real volume changes(e) none of the above.

2. "Stagflaction" refers to: (a) a simultaneous increase in output ad the price level (b) a simultaneous reduction in output and the price level (c) an increase in the price level accompanied by decreases in real output and employment (d) a decline in the price level accompanied by increases in real output and employment.

3. To improve the "natural rate of unemployment": (a) pursue contractionary macroeconomic policies (b) try to improve on structural imperfections in the labor market (c) raise the minimum wage (d) pursue expansionary macroeconomic policies (e) don't bother with any of the above.

4. The Humphrey-hawkins bills: (a) denounces the use of monetary and fiscal policy as means of combating cost-push inflation (b) proposes that the United States control its exports of food to offset the higher prices on OPEC petroleum (c) advocates the manipulation of the international value of the dollar for the purpose of stabilizing the domestic economy (d) endorses economic planning as a means of achieving fill employer of last resort.

5. The structural bind which characterizes many modern economies is that of: (a) stagflation, where there has been excessive expansion of both monetary and fiscal policies (b) not having adequate statistics for determining what are the proper doses of monetary and fiscal policies (c) braking inflation without

engineering a slowdown in output and employment (d) not knowing how to limit the rate of demand pull inflation (e) being overly expansionist in the short run and ignoring long-run consequences.

6. The basic problem portrayed by the Phillips curve is: (a) that unemployment ends to increase at the same time the general price level is rising (b) that changes in the composition of total labor demand tend to be deflationary (c) the possibility that automation will increase the level of noncyclical unemployment (d) that a level of aggregate demand sufficiently high to result in fill employment may also cause inflation.

7. If everybody learns to anticipate the rate of inflation correctly, the long-run Phillips tradeoff between price change and unemployment becomes: (a) a "kinked curves as in oligopoly (b) an L-shape formed by the two axes (c) a vertical line (d) a horizontal line (e) none of the above.

8. If people come to fear and expect price inflation, they: (a) are not likely to shift any Phillips curve, for any such curve depicts only a short-run relationship (b) bring on stagflation by shifting their Phillips curves to horizontal line (c) bring on stagflation by shifting their Phillips curves to a vertical line (d) shift their effective Phillips curves, but it is not known in which direction (e) shift upward their effective Phillips curves.

9. The proposal for an "excess wage settlements tax" holds that: (a) workers who receive inflationary wage increases, will be forced to pay higher income taxes (b) firms which grant inflationary wage increases must pay a special surtax on their profits (c) unions which negotiate wage increases in excess of productivity increases will be find by the Federal government (d) corporations which are successful in limiting wage increases will qualify for rebates on their corporate income tax payments.

10. We speak of demand-pull inflation when: (a) MV is no longer exactly equal or proportional to PQ (b) M changes and prices go up (c) aggregate demand, prices, and employment are all rising at equivalent rates (d) aggregate demand is greater than the value of what the economy can produce at Kill employment (e) the Germans greatly contracted their money supply in the 1920s.

11. During periods of unemployment: (a) the unemployment rate for women is lower than that for men (b) the unemployment rate for blacks is roughly twice the rate for whites (c) the unemployment rates for teen-agers is below the rate for the labor force as a whole (d) the burden of unemployment is quite evenly distributed among males and females, blacks and whites, and young and old workers.

12. If the modern mixed economy wises to enjoy both fill employment and price stability, then it should: (a) control all prices

permanently (b) control all prices (c) institute mandatory wage-price guidelines (d) institute voluntary wage-price guidelines (e) consider all of these, but not necessarily choose any one.

13. Inflation is undesirable because: (a) it arbitrarily redistributes real income and wealth (b) it tends to be cumulative; that is, creeping inflation invariably causes hyperinflation (c) I always tends to make the distribution of income less equal (d) it is typically accompanied by a declining real output,

14. In order to secure a better Phillips curve, it might be necessary to: (a) make minimum wages more flexible, which may mean reducing rather than increasing the wage rate (b) make the government the employer of last resort (c) increase the size and scope of manpower training programs (d) reduce structural unemployment (e) do any or all of the above.

15. the equation of exchange suggests that, if aggregate demand is constant, an increase in the price level due to cost increases or shortages will: (a) shift the Phillips Curve to the left (b) reduce the velocity of money by a compensating amount (c) be compatible with a growing real GNP (d) reduce real output and employment.

Fill in the blanks:

1. By_____ we mean. a course of action aimed at securing long-run price stability with simultaneous fill employment.

2. A _____ shift of the Phillips curve suggests that a lower rate of inflation is now associated with each rate of unemployment than previously.

3. _____are kinds of government expenditure which have the largest ultimate impact upon the level of GNP.

4. The_____ suggests a conflict or tradeoff between a level of employment and price level stability.

5. To go from a short-run Phillips curve to a long-run Phillips curve. we shift the former _____.

6. The wage-price guideposts suggest that wage increase should not exceed the rate of increase in the narion's _____.

7. eisenhower's running a slack economy with high unemployment in the late 1950s probably gave Kennedy a_____ Phillips curve to the left.

8. Congress' Joint Economic Committee claimed that unions and management in the steel industry priced steel out of the

international market in the 1950s. this process is best described by the inflation.

9. The wage-price guideposts were designed to limit wage rate increases to the annual increase in_____ productivity.

10. If we wish to improve the position of the Phillips curve. we would pursue policies such as making minimum wage rates more_____.

11. Keynesians feel that in the 1970s. the Phillips curve may have shifted to the right because of changes in the composition of the_____.

12. If the price of a product or resource if frozen at some level below the equilibrium price, a _____ occur.

13. According to_____ and Luxemburg, capitalist economist' markets could not operate to support consumption and purchasing power at high enough levels.

14. By_____ we mean the existence of both inflation and unemployment.

15. We usually expect that, when demand is inadequate prices fall or at least do nor rise; _____ phenomena contradict this expectation.

Determine whether the following statements are true or false:

1. Milton Freidman believes unions and monopolies are the main reasons for inflation.

2. The wage-price guideposts of the Kennedy and Johnson ad-ministrations made it illegal to raise wage rate by more than the increase in national productivity.

3. Every mixed economy has the knowledge to create whatever domestic purchasing power it needs for full employment.

4. If national productivity rises by 4 percent and money wages increase by 2 percent, then unit costs of production will decline.

5. There can be no inflation without an increase in the money supply.

6. A shift in the Phillips Curve to the left will improve the grate of inflation-rate of unemployment D choices available to society through the application of monetary and fiscal policy.

7. Society has really only one choice: that of less unemployment now at the cost of more unemployment later.

8. Demand-pull inflation and cost—push inflation are essentially identical concepts because both entail rising money wages and rising prices.

9. The wage guideposts constitute a good example of what is meant by an incomes policy."

10. The Phillips curve relationship suggests an inverse relationship between increases in the Price level and the level of employment.

11. The wage-price guidelines state that the average money-wage increase is to be no higher than the average increase in physical productivity.

12. A long-term or permanent wage-price freeze is consistent with the goal of efficiency in the allocation of resources.