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.

[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.

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.

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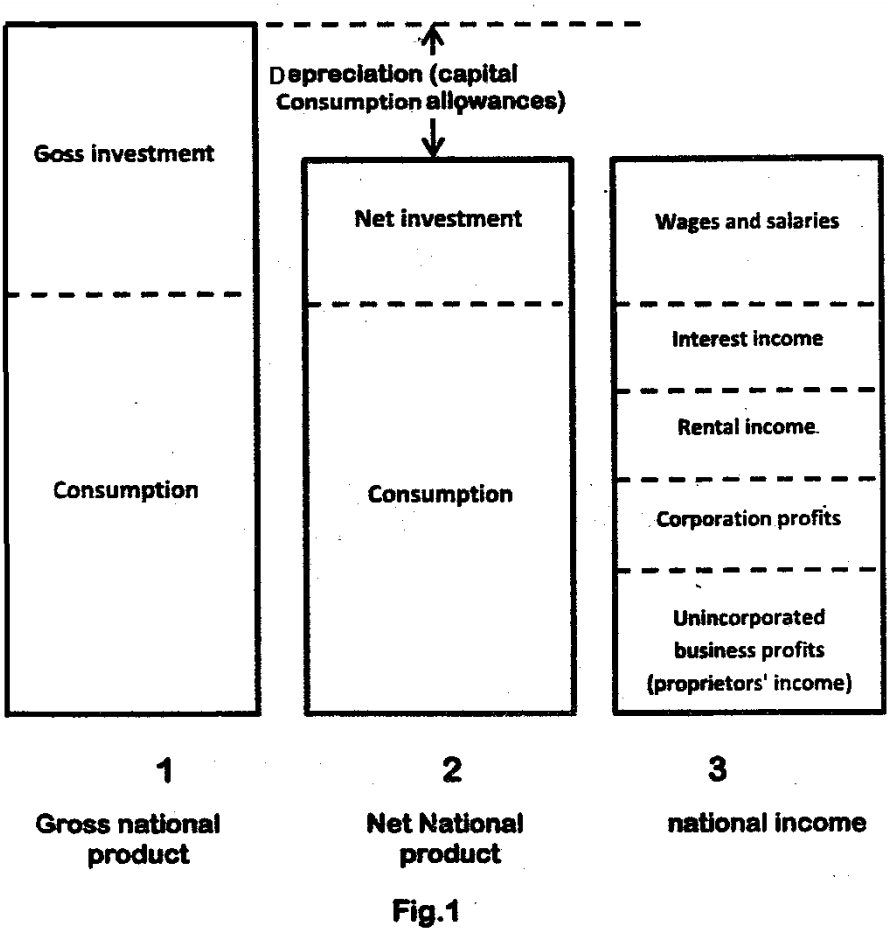

Fig.1

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).

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a

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c

d

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

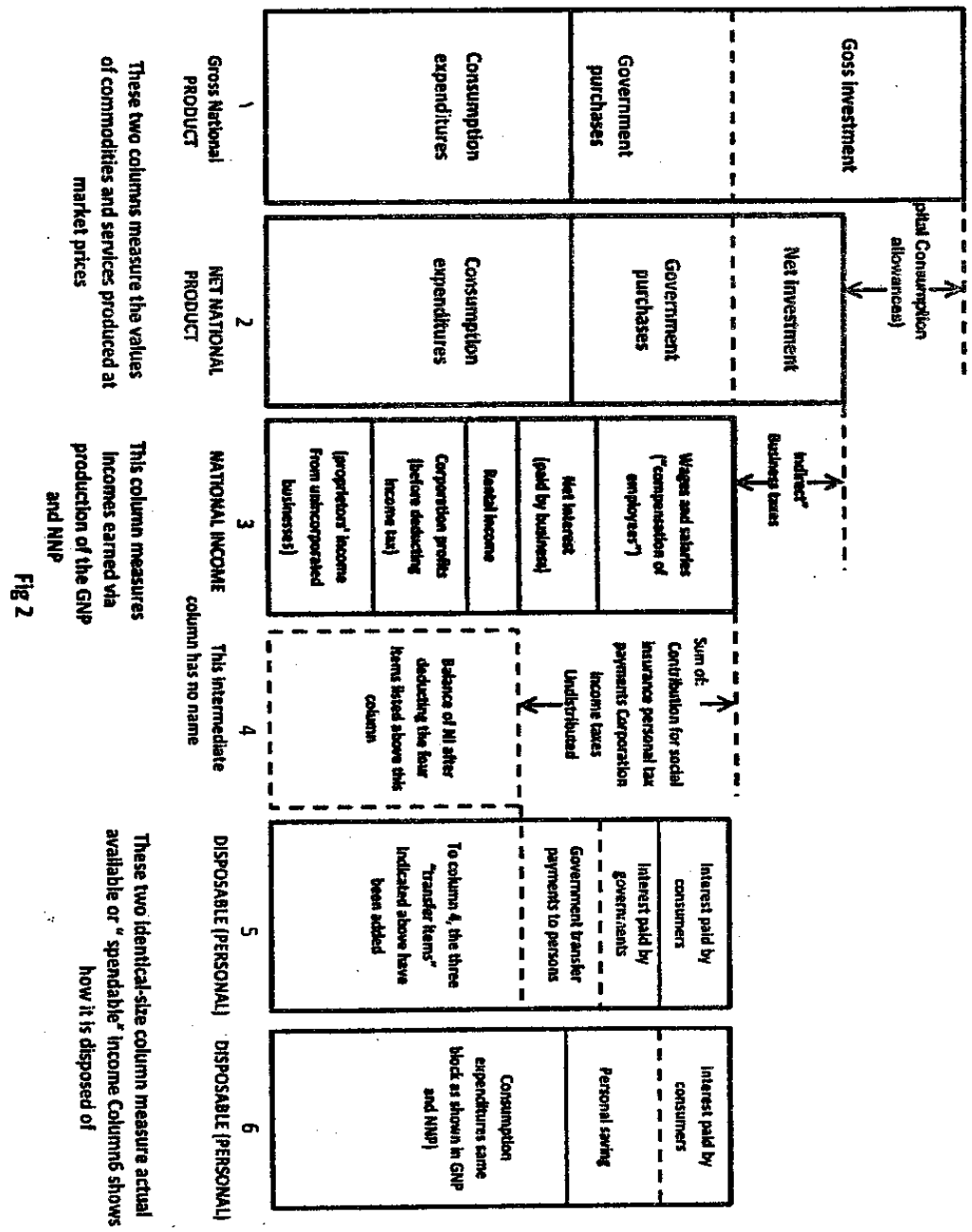

Fig 2

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

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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[1] [0]

[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.

[1] [0] - 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).

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a

b

Chapter Two

Chapter two

An analysis of aggregate expenditure on goods and services

In developing our analysis of aggregate expenditure on goods and services. we draw upon our understanding of its components– consumption investment, government spending, and net exports. One of the major points to bear in mind as we analyze aggregate expenditure is that our macroeconomic model is concerned with planned or intended behavior. By this we mean that we wish to understand the various forces that lead households to choose one level of consumption over another and investors to choose a certain quantity of spending on investment goods. Thus, we need to detail the forces underlying consumption and investment plans, along with what drives government spending and net exports to their particular levels. We will see that only when all expenditure plans are actually realized will the aggregate market for goods and services be in equilibrium. Whether full employment in the labor market will prevail when the goods and services market is in equilibrium–leading to full macroeconomic equilibrium and to full employment GNP– is another question. In this chapter, we are

concerned only with circumstances that lead to equilibrium in the aggregate market for goods and services.

The consumption function

The cornerstone of the aggregate expenditure relationship is the consumption function, which illustrates the relationship between planned consumption and society's total income (GNP). It is called the consumption function because it is a relationship between the variable consumption and another set of variables that determine how much households desire to consume in any given year.

Economists who analyze macroeconomic issues have found it very useful to distinguish between two categories of factors that affect household consumption behavior. One category includes only one variable- the income that households receive. The other category includes all of the factors other than household income that affect consumption, such as basic subsistence needs, expectations about the future, the desire to save income now so that more may be consumed later, and so on. We have seen that GNP, which determines the income of households, depends itself on the level of planned consumption expenditure. For this reason, that part of consumption that depends on

household income is called endogenous consumption. The word endogenous is used because it refers to that part of consumption that originates in the circular flow between GNP and income. That part of consumption that depends on factors other than income and GNP is determined outside the circular flow and is therefore called exogenous consumption. To summarize, we divide planned consumption into two parts: endogenous consumption and exogenous consumption. Using the symbol C* to denote total planned consumption, we say that

C* ≡ (planned) endogenous consumption + (planned) exogenous consumption.

The income available for consumption, which is the amount households have left over after paying their taxes, is called disposable income (YD), as indicated in figure 1 (we shall ignore the fact that in the official national income statistics, depreciation of plant and equipment must also be subtracted from GNP to derive disposable income) if you take another look at table 3, you will see that disposable income (or disposable personal income as it is officially named) includes government transfer payments, which include social security, aid to

families with Dependent Children, and similar payments that add to the spending power of individuals and families over and above what they earn. You should think of government transfer payments as taxes in reverse, or negative taxes. In figure 1, we have simply subtracted government transfer payments from the taxes the public pays the government to obtain net taxes of $20 billion. For example, if taxes paid were $35 billion and transfers paid by the government to households were $15 billion, then net taxes paid by households to the government would be $20 billion. Since taxes paid to the government typically exceed transfer payments from the government, net taxes are usually positive. What households have left to save or consume after net taxes are subtracted from their incomes is disposable income.

A good way to remember how GNP, net taxes, disposable income and consumption are related is this. A change in GNP (national income) will change disposable income and endogenous consumption but not exogenous consumption. Variables other that a change in GNP will change exogenous consumption but not endogenous consumption. A change in taxes that does not itself result from a change in GNP will cause exogenous consumption to change. If tax policy does not change,

then exogenous consumption will change only when forces other than GNP of taxes change.

The consumption function expressed Quantitatively

We will now put some meat on the bare bones of the exogenous and endogenous consumption concepts. Table 1 contains a numerical example of the relationship between GNP, taxes disposable income (YD), exogenous consumption, total consumption, and saving. In this example, we assume that net taxes are fixed at $20 billion annually and that exogenous consumption is fixed at $10 billion per year. Endogenous consumption, as defined, depends on the level of disposable income, which in turn depends on total income, or GNP, To be precise, whenever GNP and disposable income change, endogenous consumption and total consumption change by exactly 80 percent as much. For example, when GNP increases from $150 billion to $200 billion, disposable income also grows by $50 billion, and both endogenous and total consumption increase by $50 billion × 0.8. or $40 billion.

The general nature of the consumption function will be easier to understand if we use some simple algebra. In our algebraic representation of the consumption function, we will use the symbol A to represent exogenous consumption. In table 1, A equals $10 billion. Where does A come from; why and how is it determined? The list at the bottom of table 1 indicates that exogenous consumption depends on a basic consumption needs. expectations about the future, tastes and preferences, accumulated savings, access to borrowed funds, and very important, taxes and transfer payments that do not change with the level of GNP. If a household's disposable income were temporarily to fall to zero, it would not eliminate consumption entirely, for to do so would make it impossible to survive. The consumption that would persist even if disposable income were zero is part of exogenous consumption. The funds to purchase consumption goods might come from savings accounts, borrowed funds or private charity. When people spend more than their disposable income, we say they are dissaving.

To elaborate somewhat, in the fall of 1987 the stock market suffered a significant decline. As a response, consumers reduced their purchases of many items, especially high priced items such as cars and appliances. In this case, people were reacting to the decrease in their

accumulated saving and reduced their exogenous consumption accordingly. Similarly, as you approach graduation, you job prospects become brighter and you are likely to increase the amount you consume out of current income. This is equivalent to an exogenous increase in your consumption function. Tasks can also affect exogenous consumption by influencing the amount of expenditure an individual or household views as necessary for basic subsistence. Comparing two individuals whose incomes temporarily fall to zero, one of them might be more willing to draw down savings or to borrow from friends or relatives to maintain a given standard of living than the other one. The first individual would have a higher level of exogenous consumption (value of A) than the second.

Endogenous consumption depends on disposable income which, in the simple example of table 1, changes by exactly the amount that GNP changes. (One reason the example of table 1 is extremely simple is that taxes are of the fixed, or Lump-sum type, rather than the income tax we are used to paying. We will treat taxes more realistically later on. after we establish the basic nature of the consumption function and how it relates to the aggregate goods market.) We have assumed that whenever disposable income changes, endogenous consumption

changes by a constant fraction (80 percent in our example) as much. To formulate the consumption function in terms of an equation, we will use the symbol b to indicate this fraction, which is known as the marginal propensity to consume (MPC). The MPC represents the change in consumption that occurs when consumers receive (or lose) an additional dollar of disposable income. We will use the symbol Δ to denote a change in consumption and a change in income. Thus, b. the marginal propensity to consume, can be denoted as ΔC*/ΔY. the asterisk (*) indicates that we are referring to planned consumption in table 1, the MPC equals 0.8.

We can summarize everything we have said about exogenous consumption and endogenous consumption with the following simple expression for the consumption function:

$$C^* = A + bY.$$

Where b ≡ MPC = 0.8 in our example and A = $10 billion. To see how this formula for the consumption function works, simply plug in some of the numbers from table 1. When GNP is only $50 billion endogenous consumption equals 0.8 × $5 billion. or $ 40 billion. Total consumption equals $10 billion plus $40 billion. or $50 billion. Verify for yourself that

when GNP equals $200 billion. total consumption equals $170 billion. according both to the equation above and table 1.

The consumption function expressed graphically

Figure 2 illustrates the consumption function graphically. The horizontal axis is gross national product (household's total income), which is measured in billions of real dollars. The vertical axis is planned consumption and net taxes, also measured in billions of real dollars. One way to think of the consumption function is as a computer program. This program first takes aggregate income before net taxes (real GNP), then calculates the net taxes consumers must pay, and thus also calculates their disposable income (YD), the program then considers consumers' tastes and preference and determines an amount they desire to spend on goods and services. It is the first and last statements in this computer program that we see in the line marked C* in figure 2. The upper line in the figure measures planned consumption plus net taxes that people are required to pay out of the income they receive. It is labeled C* + T. we will discuss this line later.

There is a special line in figure 2 that is the same distance from the horizontal axis as from the vertical axis. Because it runs through the middle of the right (90^{o}) angle created by the horizontal axis and the

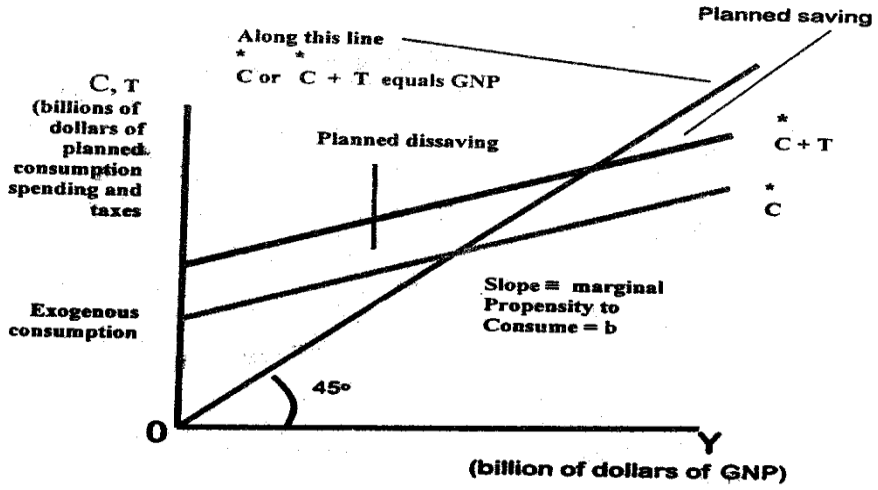


Figure .2 the consumption function

The consumption function illustrates how real income (GNP) influence society's consumption spending. The slope of the consumption function is the marginal propensity to consume (b). The point where the consumption function crosses the vertical axis measures the quantity of exogenous consumption.

The upper line, marked *C + T line crosses the 45° line, planned consumption plus taxes equals GNP. In other word, at this point, planned saving is zero. To the right of this point, planned saving is positive, and to the left, planned saving is negative (there is planned dissaving).

vertical axis this line is known as the 45^{o} line. At all points along the 45^{o} line, the variables measured along the vertical axis are exactly equal to real GNP. How does the consumption function (C*) relate to the two axes and the 45^{o} line?

Figure 2 illustrates that the consumption function has two components. The first component, the marginal propensity to consume is represented in the diagram by the slope of the line labeled C*, we have already seen that the marginal propensity to consume is the

fraction b, the change in planned consumption for every dollar change in disposable income. The fact that C* line is flatter than the 45^{o} line reminds us that consumers do not plan to spend all of each additional dollar of disposable income on consumption goods. Some of it they plan to save. In other words, while b is greater than 0, it is less than 1. The second component of the consumption functions exogenous consumption. In figure 2, exogenous consumption is measured as the amount consumed when GNP equals zero, (in table 1. consumption would equal $\$10$ billion. even if GNP dropped to zero.) it is measured by the height of the consumption function where it crosses the vertical axis, because at this point, GNP equals zero.

Given that exogenous consumption is positive, while the slope of the consumption function is less than the slope of the 45^{o} line, the consumption function must cross the 45^{o} line at some point. At this point, planned consumption (measured along the vertical axis) is exactly equal to GNP (measured along the horizontal axis of figure 2). Using the numerical example of table 1, this point occurs at GNP equal to $\$50$ billion.

Now we can explain why the line labeled C* + T is also shown in figure 2 from what we have said already, it should be clear that where the C* + T line crosses the 45° line planned consumption plus net taxes equals GNP. It will help to say the same thing algebraically, as follows: the point at which the C* + T line crosses the 45° line can be expressed as

$$Y = C^* + T$$

However, we have already seen that saving is defined as the portion of households' disposable incomes that is not consumed. In other words, planned saving is GNP minus net taxes minus planned consumption, or

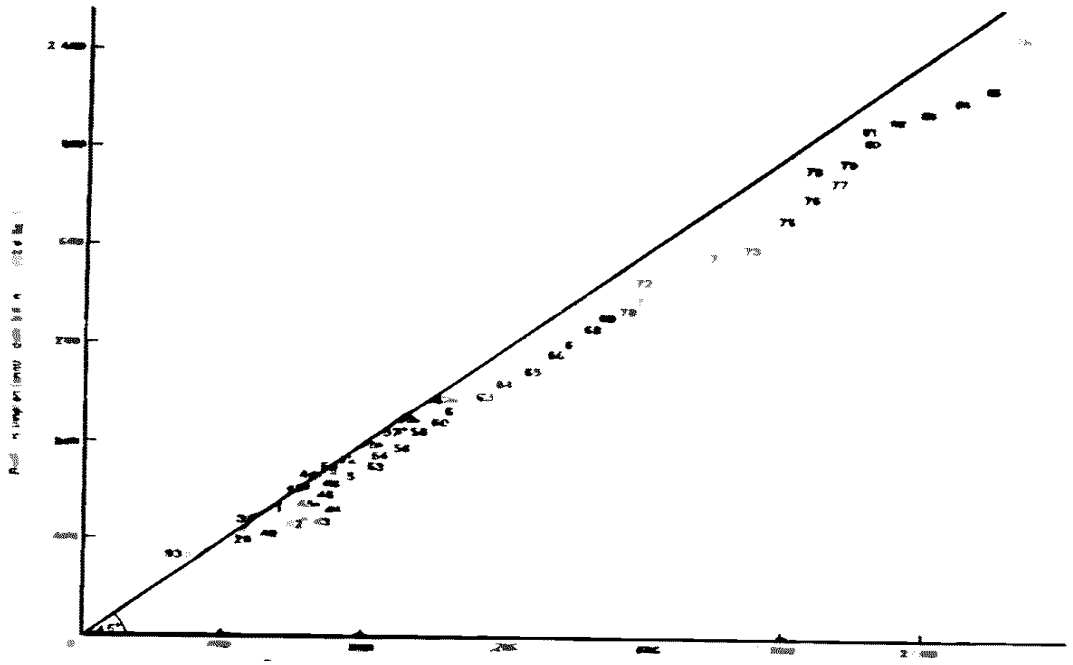
$$S^* \equiv Y - T - C^*$$

Therefore, when planned consumption plus net taxes equals GNP, planned saving must be zero. Using the numerical example of table 1, this occurs at GNP equal to \$150 billion, (to see this algebraically, substitute the first equation in this paragraph for Y in the second equation. The result shows that when GNP equals planned consumption plus taxes, planned saving equals zero.)

Figure 2 shows that when GNP is larger than planned consumption plus taxes, planned saving is positive, and when GNP is less than planned consumption plus taxes, planned saving is negative (there is planned dissaving). The shaded area to the right of the intersection of the C* + T line indicates that planned saving is positive and grows larger as GNP increases beyond the point where the C* + T line crosses the 45^{o} line. The shaded area to the left of the intersection of the C* + T line indicates that dissaving occurs and grows larger as GNP decreases from where there C* + T line crosses the 45^{o} line.

Figure 2 is a basic representation of aggregate consumption that models the observed behavior of United States consumers Figure 3, by comparison, plots out actual data on aggregate consumption and disposable (after net taxes) income for 1929 to 1987. Notice the similarity with figure 2. In 1933. when aggregate disposable income was quite low, people were dissaving. More recently, people have been saving about 5 percent of their aggregate disposable income. For example, in 1987 real aggregate disposable income was $2.68 trillion. measured in 1982 dollars, and real aggregate consumption expenditure was about $2.50 trillion, again measured in 1982 prices, on a per capita basis, real disposable income in 1987 was about $11.000 and real

consumption expenditure was about $10.250. both measured in 1982 prices. If you were to calculate the marginal propensity to consume in recent years from the slope of the consumption function in figure 2, you would see that consumers actually spent about 90 to 95 percent of an additional dollar of income after net taxes.



Figre 3 Aggregate consumption and disposable income in the united states.1929-1987
From Economic Report of the president, 1988,Table B -27,P279.
Source: Economic Report of the president, 1988,Table B -27,P279

Investment

We saw that investment includes spending by firms for their buildings, equipment, and inventories, (Investment also includes purchasing of new homes by individual households, but we will ignore this aspect of investment in most of our analysis of the aggregate goods

market.) as we discuss the role played by investment in aggregate expenditure, it is important to keep a number of things in mind. First, investment has both planned and unplanned components. Firms "draw down" on their inventories when their sales exceed what they had anticipated. They build up their inventories unexpectedly when sales fall short. Second, purchases of plant and equipment may be the result of either capacity expansion or the need to replace equipment because of wear and tear from past use. The most important point however, is that current investment is largely independent of firms' current sales. Let us explain this more fully and identify the economic variables that have the greatest impact on aggregate investment.

As we discussed, events in the loan-able- funds, or credit, market are very important in determining firms' investment decisions. In particular, the interest rate, which is determined by supply and demand in the loanable-funds market, has an important influence on the profitability of firms' investment plans. High interest rates make it expensive to borrow funds for investment. This should not be surprising to anyone who has thought about financing the purchase of a new or used car with a loan from a bank or other lending institution. A two- or three- percentage point increase in the interest rate payable on the loan

can make a significant difference in your ability to purchases a relatively late model versus a clunker.

Investors need not have to borrow funds for the interest rate to be important in determining their planned expenditures on investment goods. Funds that a firm uses to finance, say, a new building could have been deposited in a savings account or lent to others at the prevailing interest rate. This means that an opportunity cost is incurred in the form of the interest that could have been earned on the money used to finance the building. Thus, it does not matter whether a firm has to borrow from a lending institution such as a bank or borrow implicitly from itself. In either case, there is an interest cost of investing, ad that cost rises with the interest rate. At higher interest rates, the backend of investment–the future payoff–becomes less profitable. Thus, planned investment will be lower the higher the cost of credit (the interest rate). Conversely, lower interest rates encourage greater investment.

The profitability of investment is also related to the rules for taxing the return on an investment. Examples are depreciation allowance and tax rates on capital gains. The goal of the Economic Recovery Tax Act of 1981 (ERTA) is to make investment more profitable in general and

especially more profitable in specific areas such as research and development. The Tax Reform Act of 1986 increased the tax rates on capital gains by eliminating the special allowance that previously existed. In addition, the 1986 act eliminated the investment tax credit for corporations, altering the rate of depreciation for new investment.

Another factor to consider is that investment takes time and pays off in the future. As a result, today's investment is heavily influenced by a firm's anticipations of what sales are likely to be over a period of years. Thus, many economists would say that expected future growth in production, not current production, plays the major role in determining new investment.

Finally, we know that a part of current investment is the replacement of worn-out buildings and machinery. In fact, one half to three fourths of total investment in recent years falls into the category of replacement or depreciation. Thus a good deal of current investment depends upon how rapidly machines and other equipment become obsolete and how they were used in the past. This means that past production but not necessarily current production, also plays an important role in determining current investment.

One of the main implications of this section is that it is appropriate to treat planned investment as independent of current production (real GNP). Intended investment can be shown as the horizontal line labeled I* in figure 4. The fact that the line representing intended investment is horizontal means that aggregate investment does not change if current output (real GNP) change.

To summarize, planned investment depends on the rate of interest as determined in the credit market, taxation policy, past production, and expected future production. Investment should be viewed as exogenous with respect to current real GNP as determined in the current circular flow of production and income. Changes in any of the factors that influence planned investment will result in changes in investment expenditure that have an important influence on aggregate expenditure on goods and services. income, employment, and unemployment. If, for example. the interest rate was to fall, then intended investment would increase from I* in figure 4 to some higher level, say, I*. if the government reduced taxes on business profits, or if firms expected future sales to grow sharply and remain higher than they are now, then planned investment would also be likely to grow.

Government expenditure

Government spending on goods and services, like planned investment, will be treated as exogenous, or independent of current real GNP. (By government spending we refer only to spending on goods and services. Government also spends on transfer payments, but this form of government expenditure is already accounted for by our calculation of net taxes.)

We will assume that government spending is for the most part determined by past budget decision that are updated relatively slowly.

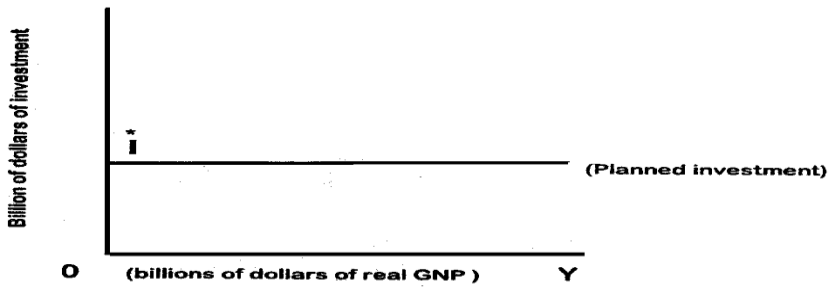


Figure. 4 planned investment
Investment largely depends upon (1) the interest rate as determined by supply and demand in the loanable–funds market, (2) expectations of future output growth, and (3) past levels of production. Thus, intended investment tends to be unaffected by short-term changes in production (real GNP). I* represents the level of investment that firms plan to make during the current period.

Government spending is shown by the horizontal line in figure 5. It is important to reemphasize that while planned investment and government spending are exogenous (not dependent on the current level of GNP) in figure 5 this does not mean that they never change.

For example, governments can and do change the level of their expenditures on public works, such as highway construction and new buildings.

Net Experts

To complete our model of aggregate expenditure on goods and services, we will analyze the role of imports and exports in the circular flow. The determinants of net exports (exports, or sales of goods and services to foreign countries, less imports or purchases of goods and services from foreign countries) will be analyzed in depth in later chapters. However, anyone who follows current news must be aware that our economic relationships with other countries are of constant concern to business and government policy makers. This concern is well founded, because net exports of goods and services has important influences in both the aggregate market for goods and services and the financial sector of the macroeconomy.

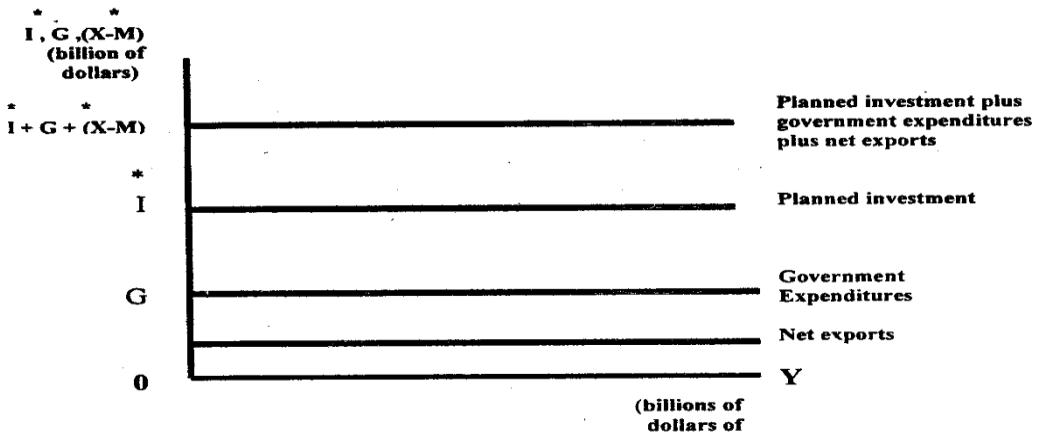


Figure. 5 planned aggregate investment and government expenditures planned aggregate investment, government expenditures and net exports are each largely independent of current real GNP. Thus, they can be represented by the horizontal lines I* , G , and (X-M)* , respectively. We can designate their sum by the horizontal line that hits the vertical axis at the height I* + G + (X-M)*.

To understand how imports and exports influence the circular flow of production and income, consider the following example, suppose the total amount of planned consumption, investment, and government spending by domestic citizens is $100 billion. If $10 billion of this planned expenditure is satisfied by goods and services purchased from abroad, then GNP–goods and services produced in this country–need only $90 billion to satisfy the current demand for goods and services. However, if foreigners seek to satisfy their demand for consumption, investment, or government goods by purchasing, say $5 billion of our goods and services, then our GNP must be $5 billion more than needed to satisfy the domestic demand for goods and services. The net outcome in this numerical example is that net exports (X – M) equals – $5 billion (we import $5 billion more than we export). and GNP equal to

$95 billion will satisfy both domestic and foreign purchasers of our goods and services. To summarize, total planned expenditure on domestic goods and services equals the sum of planned consumption, planned investment, government expenditure, and net exports.

In later chapters we see in more detail why citizens of one country might wish to purchase the goods and services produced abroad. For now, we must recognize that foreigners who sell goods and services to us want to be paid by our importers, just as our exporters demand payments by their foreign customers. When net exports are not zero, then either exporters are selling more to foreigners than foreign exporters are selling to us, or our importers are purchasing more from abroad than our exporters are selling.

In the numerical example of the last paragraph, net exports are negative. This means that foreigners' purchases from us are less than we buy from them. Very simply, we end up owing money to foreign countries for the amount that our imports exceed our exports. One way this problem is solved in everyday foreign commerce is that we pay our foreign debt in dollars. The foreigners who receive these dollars may simply accumulate them in the form of cash or checking accounts.

Another possibility is that they might decide to use their dollars to purchase assets in the United States such as real estate or common stock of United States corporation.

Another possible outcome is that foreigners are willing to lend us the funds to pay for our net imports from them. In other words, just as domestic citizens may borrow funds to finance their planned expenditures on new cars, equipment, or buildings, the citizens of one country can finance imports of goods and services by going into debt to the citizens of other countries rather than paying “in cash”. The funds to carry out such transactions with foreign countries are obtained in the credit market. Foreigners will be willing to accept our bonds, or IOUs in return for selling goods and services to us if the interest rate is high enough to make it attractive to postpone purchasing imports from us or to give up the convenience of holding on to our currency.

As we will discuss later, the concern over the United States net imports in recent years is directly related to the view that foreigners are accumulating claims of one kind or another against United States citizens. If they hold on to dollars. This money can be used later to purchase current production. If they buy assets such as real estate or

stock in United States company, foreigners gain some control over an important aspect of our economy. If they lend us the funds to purchase imports from them, we will eventually have to pay them back, which means reducing the amount of our GNP that we can use to satisfy our own needs.

To summarize, net exports, like planned investment and government expenditure, depend on a variety of factors that have little to do with the current circular flow of production and income. One important determinant of net exports is the interest rate, determined in the loanable funds, or credit market. We will therefore treat net exports as exogenous, similar to planned investment and government expenditure. We can therefore show net exports in figure 5 as a horizontal line, and add it to planned investment and government expenditures to indicate total planned investment government expenditures and net exports as a constant amount, which does not vary with GNP.

Aggregate Expenditure, Aggregate production, and Equilibrium GNP

We are now prepared to take a deeper look at the conditions that determine equilibrium in the aggregate market for goods and services. We have already seen that equilibrium in the goods market means that desired purchases of total output (GNP) equals the quantity of GNP produced. We define desired purchases of GNP to be planned aggregate expenditure, which is simply the sum of planned expenditures by firms, households, the government, and net exports. In other words, planned aggregate expenditure is the sum of planned consumption, planned investment, government spending, and net exports, or

$$E^* \equiv C^* + I^* + G + (X - M)^*.$$

At this point you may be asking yourself why there is no asterisk (*) over G remember that firms' or consumers' planned behavior may not be realized. So that firms, for example, may end up investing more or less than intended. However, we are assuming that government always spends what it planned to spend, so that actual and desired spending typically coincides. Thus, there is no need to put an asterisk over G.

Planned aggregate expenditure, E*. can be depicted in a graph that starts out with the basic consumption function illustrated in figure 2 and then adding to its planned investment, government expenditure, and net exports, as illustrated in figure 6. Since figure 5 shows that the sum of planned investment, government expenditure, and net exports does not vary with GNP, the shape of the aggregate expenditure line E*, in figure 6 is exactly the same as the consumption function, only higher. The E* line lies above C* by exactly the amount I* + G + (X –M)*. Remember that the 45^{o} line plots out all the points where whatever is measured along the vertical axis equals what is measured along the horizontal axis. Therefore, at the point where the planned aggregate expenditure line, E*. crosses the 45^{o} line, E* = GNP. This means that at the level of GNP at which planned aggregate expenditure crosses the 45^{o} line, firms sell exactly the quantity of goods and services GNP) that they have produced, and all households firms, and government agencies are able to carry out their expenditure plans. In short, Y(0). is called equilibrium real GNP, because it is the level of total output produced when there is equilibrium in the aggregate market for goods and services.

The common sense of this is that if firms decide to produce one dollar more than $Y(0)$. the additional income generated will lead to less than an additional dollar of planned expenditure. This is because planned consumption rises by less than $\$1$ for each $\$1$ increase in disposable income. In our numerical example of the consumption function, the MPC is 0.8. and the slope of the E* line is equal to the MPC. therefore, when production of GNP increases by $\$1$, planned consumption and planned total expenditure both increase by only $\$0.80$. Taxes, which are assumed exogenous, don't change when income rises, but planned saving does (by $\$0.20$) per dollar increase in production in our example). If the increase in planned saving led directly to an equal increase in some other component of planned expenditure, such as planned investment, government spending, or net exports then a dollar increase in production would always lead to a dollar increase in planned expenditure. However, planned investment, government expenditure, and net exports are all exogenous. Planned saving is unlikely to affect government expenditure at all, and planned investment and net exports are linked to planned saving only indirectly through the loanable funds market.

The discussion of the last paragraph shows that if firms choose to produce a level of real GNP such as Y (1) in figure 6, they will find that they cannot sell all they have produced. They will therefore reduce their production levels. As real GNP falls, so will employment, and some workers will lose their jobs.

The story is reversed if firm's decisions lead them to produce a level of real GNP that is less than planned aggregate expenditure, such as Y (2). in this case, society demands more goods and services than firms have produced. Production and/or prices will increase as buyers bid for the items they desire and firms try to meet sales that exceed their projections.

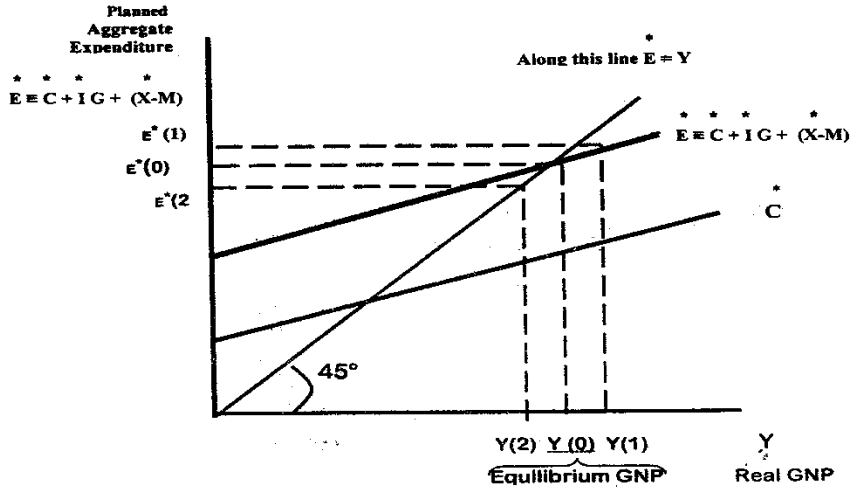


Figure. 6 Equilibrium real gross national product
E* represents planned aggregate expenditure C* + I* + G + (X-M)*. The point at which E* crosses the 45° line shows where planned aggregate expenditure equals GNP produced. Since firms are able to sell all they produce at this level of GNP and consumers, investors, the government , importers, and exporters can all carry out their planned expenditure , Y (0) represents equilibrium GNP, which is equal to E* (0) , planned aggregate expenditure on the GNP.
If GNP produced equals Y (1) , then planned aggregate expenditure E* (1), will be less than Y (1) , and firms will have to reduce their production. If GNP produced equals Y (2), then planned aggregate expenditure, E* (2) , will be greater than Y(2) , and firms will increase their production

Aggregate expenditure on goods and services

Overview

This chapter is a description of the demand side of the macroeconomy and how it relates to the GNP. The total of the components of this demand, such as consumption expenditures, investment, government expenditure, and net exports, is also another way of expressing the real income paid out to suppliers of resources, which can be used only for consumption, saving, or paying taxes. The equality between planned expenditures and income leads to the key relationship between saving and planned investment. In particular, it leads to the requirement that when planned saving equals planned investment plus the government deficit, the system is in equilibrium. The consumption function shows the relationship between planned consumption and total income to be a direct one. resulting a particular level of saving or dissaving. The key to investment is the interest rate, so investment is assumed to be unrelated to the level of current production. Government spending is also treated as exogenous to current real GNP. Then, when planned aggregate expenditures are equal to planned aggregate production, the conditions of equilibrium are

established. All of this is part of the ground work for understanding how government policy affects real GNP in the United States.

The language of Economics: Vocabulary

1. Saving

You can use your total income in three ways. First, taxes must be paid. The income left over after paying taxes is called disposable income. You can do two things with your disposable income-you can consume or you can save (not consume). Thus saving is the residual after taxes and consumption are removed from total income.

2. Consumption function

We want to know why people make greater or lesser consumption expenditures that is, buy food, clothing, Vacations, and other goods and services. The single most important determinant of the level of consumption is size of disposable income. The greater one's disposable income, the greater the level of consumption, ceteris paribus. When we graph total planned consumption against total income (holding everything else constant), the relationship gives us consumption function. The slope of the consumption function is the marginal

propensity to consume. If we change any of factors held constant while drawing the consumption function, the graph will shift in a parallel fashion. This is known as an exogenous change in consumption because it occurs from a change in a factor other than income. For example, a change in consumers' expectations about the inflation rate will shift the consumption function. If disposable income changes, the result is an endogenous change in consumption, which is indicated by moving from one point the consumption function to another point consumption function.

3. Disposable income

Disposable income is total income minus taxes. It is what really is available for expenditure purposes. In symbols, disposable income is described as $YD \equiv Y - T$.

4. 45° Line

The 45° line indicates the points at which what is measured along the vertical axis equals what is measured along the horizontal axis.

5. Dissaving

When people spend a greater amount than their disposable income, they are doing the opposite of saving. Either they draw down their accumulated savings or they borrow. Dissaving is simply negative saving.

6. Marginal propensity to consume (MPC)

If ever time $\$1.00$ is added to disposable income $\$0.90$ is spend, then the marginal propensity to consume (MPC) equals 0.9. Graphically, that would mean the change in the vertical axis (consumption) equals $\$0.90$ and the change in the horizontal axis (income) is $\$1.00$. The slope equals vertical change/horizontal change. Therefore, the MPC Is the slope of the consumption function line and is equal to the change in consumption divided by the change in disposable income. The most that can be spent is the entire dollar, when the MPC is 1. If the entire dollar is saved, MPC is 0. Therefore, the MPC is greater than 0 and less than 1. When we draw the consumption function as a straight line the MPC is a constant (since the slope of a straight line is constant). The recent MPC in the United States, calculated as the relation between aggregate consumption and disposable income, has varied between 0.8 and 0.9.

7. Planned aggregate expenditure E^*

If we add planned consumer expenditure to planned investment and government spending on good and services. we have all the ways in which GNP can be bought. We are assuming net exports equal zero. The intended expenditure represents the aggregate expenditure for goods and services and is called planned aggregate expenditure E^*

8. Equilibrium real GNP

Equilibrium real GNP occurs where planned aggregate expenditure equals planned aggregate production. Firms are able to sell all they had planned, and buyers are able to buy what they planned. thus. the goods market is in equilibrium. As we will see, this does not imply that the labor market is also in equilibrium. Graphically, equilibrium real GNP occurs where the 45^o line intersects the planned aggregate expenditure line. Algebraically, it occurs where $E^* = Y$. This leads to the following equality in equilibrium: $^*I + (G - T) = {}^*S$.

9. Marginal propensity to save (MPS)

If saving increases $\$0.10$ every time $\$1.00$ is added to disposable income, then the marginal propensity to save (MPS) would be 0.10. The marginal propensity to save is equal to the change in saving divided by the change in disposable income. Thus, the MPS is also equal to the slope of the saving function. Because all of the increase in disposable income goes to either increased consumption or increased saving. MPC + MPS$\equiv 1$. Therefore, in the above example, the MPC is 0.9. so the MPS must be 0.1.

10. The multiplier

When planned aggregate expenditure changes exogenously (I.e,. the E* line shifts up or down), equilibrium real GNP changes by a greater amount. This is due to the multiplier effect. For example, suppose that firms plan to increase investment by $\$20$ billion. This will initially increase expenditures by $\$20$ billion. But as income increases by $\$20$ billion, consumption will increase by the MPC times $\$20$ billion. This will cause another increase in income which will further increase consumption. This process will continue. Eventually, income will

increase by billion. Suppose the MPC is equal to 0.8. Then, $\frac{1}{1-08} = 5$ And the change in income is $\$100$ billion $(5 \times \$20$ billion$)$.

11. Saving function

The saving function is the relationship between the level of saving and total real income holding everything else constant. We draw the saving function as a straight line with a slope equal to the marginal propensity to save. At each possible income level, a high consumption level necessarily means a low saving level and vice versa. If we know the consumption function for an economy, we can figure out what the saving function must be. When consumption is written in terms of disposable income. for example, let *C = $100 + 0.9$ (Y − T). then we know

* S= $-100 + 0.1$ (Y − T). where 0.1 is the MPS.

Questions

Multiple choice questions

1- Total income equals consumption plus saving plus

a. Investment

b. Government.

c. Taxes.

d. Transfer payments.

2- Which of the following is an example of unplanned investment?

a. An expansion of output when demand increases.

b. An increase in inventories when sales drop

c. An expansion of plant size.

d. An increase in the amount of capital equipment purchased when the interest rate declines.

3. Government spending is logically treated as exogenous to real GNP because

a. It does not change directly with increases or decreases in current

b. It does not change very much with changes in the interest rate.

c. Much of government spending simply redistributes income.

d. All of the above.

4. A family's disposable income is $18.000. but they spend $19.500. getting the extra $1.500 by borrowing. If their income were raised to $19.200. they would spend $20.100. Out of the extra $1.200 income.

   a. Nothing would have been saved.

   b. $1.200 would have been spend on consumption.

   c. There would have been a saving of $600.

   d. Consumption increased by more than the $1.200.

5. When the consumption function is *C = 50 + 0.8 (Y − T). then

   a. The saving function is *S = − 50 + 0.2 (Y − T).

   b. The saving function is *S = 50 − 0.2 (Y − T).

   c. The exogenous level of consumption is $50.

   d. The multiplier is 2

6. Equilibrium GNP exists in the macroeconomy when

   a. There is full employment.

   b. The level of prices is not changing.

   c. Intended production levels match intended aggregate expenditures.

   d. All of the above occur simultaneously.

7. The multiplier equals 2 for the economy when

a. The MPC and the MPS are equal.

b. The marginal propensity to save is 0.2.

c. An increase in planned investment leads to an equal increase in equilibrium GNP.

d. The marginal propensity to consume is 0.2.

8. When investment and government spending are treated as exogenous. the slope of the planned expenditures line is

a. The MPC.

b. Greater than the MPC

c. Less than the MPC.

d. Greater than or less than the MPC.

9. The relationship between MPC and MPS is that

a. They must add up to 1 because disposable income is the sum of consumption and saving.

b. The greater the MPC, the greater the MPS.

c. They are both equal to the slope of the planned expenditure curve.

d. 1/MPC is the multiplier while 1(1 − MPS) is also the multiplier.

10. Which of following is the most important variable in the determination of the level of investment?

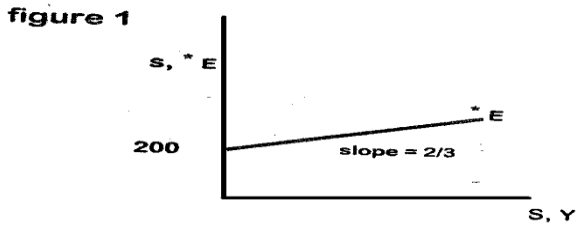
a. The firm's current production.

b. The present profitability of an investment.

c. The interest rate

d. Whether or not the firm has sufficient reserves.

figure 1



11. The multiplier in the economy represented figure 1 is

a.2/3

b. 3/2

c.3

d. None of the above

12. The equilibrium level of income in the economy represented in figure1 is

a. $300

b. $600.

c. $900

d. None of the above.

True- False Questions

1. Planned aggregate expenditure is a way of showing the demand for the goods and services produced by the macroeconomy.

2. Disposable income is what consumers have available to spend after they pay taxes and decide to save a certain amount.

3. If the marginal propensity to save equals 0.40. a person spends 60 percent of income.

4. The level of planned investment is not determined by the interest rate; therefore. it is called exogenous.

5. The amount of government spending and the level of investment are both fixed with respect to real GNP.

6. An increase in taxes shifts the aggregate expenditure schedule upward.

7. By 1941. real investment in the United States had increased sufficiently so that it was twice as high as it had been in 1929.

8. A line through the origin at a 45 angle is a representation of the aggregate expenditure schedule.

9. National income accounts do not make any distinction between planned and actual inventory changes.

10. Exogenous consumption is the level of consumption if GNP equals zero.

11. Current investment depends a great deal on past production.

12. When GNP is plotted on the horizontal axis. the line that represents *C + T crosses the 45o line where saving is zero.

13. Firms that fund their own investment expenditure are not influenced by the interest rate.

14. An increase in endogenous consumption causes an upward shift in the planned expenditure curve.

15. The consumption function crosses the 45o line where planned consumption equals planned saving.

16. The vertical intercept of the consumption function is the level of endogenous consumption.

17. The slope of the consumption function always less than the slope of the 45^{o} line.

18. The later the MPC. the larger the multiplier. ceteris paribus.

Exercise 1 The consumption function

Aggregate expenditure on goods and services includes personal consumption expenditure, investment by firms, net exports abroad, and government purchase of goods and services. The largest of these components is consumption expenditure, investment by firms, net exports abroad and government purchase of goods and services. The largest of these components is consumption expenditure. Consumption expenditure depends on real income (GNP), wealth, expectations about the future, the inflation rate, the age composition of households, and other factors. The most important of these factors is total income. If we hold all other factors constant and let income vary we can construct the consumption function.

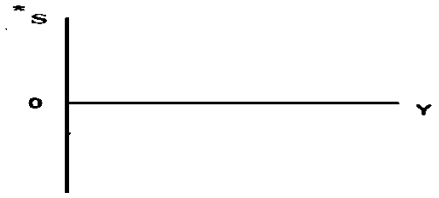
Given the following (in billions of dollars):

Income	Consumption	Saving
1.000	1.200	
2.000	1.900	
3.000	2.600	
4.000	3.300	
5.000	4.000	

1. Calculate saving at each level of income and add it to the third column above.

2. Graph the consumption function, Include the 45^{o} line in your graph. What is the slope of the consumption function?

3. Graph the saving function, what is the slope of the saving function? At approximately what level of income is saving zero?



4- what is the level of consumption when income is zero?

5- Write an equation for the consumption function.

6- Write an equation for the saving function.

7- What is true about the MPC and MPS?

Exercise 2 Determining Equilibrium with the following:

Given an economy with the following:

$C^* = 50 + 0.8\ (Y - T)$

$T = 30$

$I^* = 45$

$G^* = 40$

Where the numbers represent billions of dollars.

1. What is MPC? _____The MPS?

2. What is the equilibrium level of income?

3. Write an equation that represents the saving function?

4. What is the slope of line that represents planned expenditure (E^*)?

5. What is the exogenous level of consumption?

6. What is the expenditure multiplier?

7. Suppose G increases to $\$50$ billion. What will be the new equilibrium level of income?

8. Suppose that I^* falls to $\$40$ billion. $(G = 40)$. What will be the new equilibrium level of income?

Chapter 3

INCOME DETERMINATION:

THE SIMPLE MULTIPLIER THEORY

Chapter 3

INCOME DETERMINATION:

THE SIMPLE MULTIPLIER THEORY

An important of Keynesian theory **(frequently called the multiplier theory)** is the determination of the equilibrium level of income and output. The equilibrium level is defined the sustainable level — the level of income and output that can continue to be produced assuming non unexpected changes in the economy.

Assume a closed, pure market economy **(an economy without a government sector or any international economic relationships)**. In such an economy, aggregate demand (Y_d) is equal to the of **(planned)** consumption and **(planned)** investment, where consumption is induced spending **(dependent on** the **level of income)** and investment is autonomous spending **(not dependent on the level of income)**.

$$Y_d = C + I$$

Using the GNP identity of output and income, aggregate supply **(Y, a measure of output, is equal** to income, which can be broken

down into two components, **(planned)** consumption and **(planned)** savings.

$$Y. = C + S$$

In such an economy, there are three ways to locate the equilibrium level of income:

- Since equilibrium can be defined as the level of income where total spending is just sufficient to purchase all the goods produced. it follows that in equilibrium $Y_d = Y.$.
- The equality of Y_d and Y. means C+ I = C + S. Therefore, in equilibrium I = S. economic rationale for this is as follows. The income generated from production is just sufficient to buy all the goods and services produced **(from the fundamental equality between output and income)**. Equilibrium is obtained hail that income is spent. Money that is saved represents a leakage from this circular flow of income and expenditure. Only if all the money saved is borrowed and invested **(injected back into the circular flow),** can there be equilibrium, which implies that I must equal S.

- If aggregate demand is less than the amount produced. the surplus goods will be placed in inventory. This increase in inventory is unintended and undesired, and will cause firms to reduce production, meaning the economy could not have been in equilibrium. If aggregate demand exceeds the amount produced, the excess demand can only be satisfied by firms making unintended and undesired reductions in their inventories, which will spur them to increase production in the fixture, a situation which likewise could not have been equilibrium. Consequently, a third way to locate equilibrium is the level of income where there is no unintended inventory changes.

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

The three equilibrium conditions are:

1) Y_d = Y. or C+I + G = C +S +T

2) I + G = S + T

3) Unintended inventory investment is O.

The multiplier effect refers to the fact that changes in autonomous factors (**for example** ΔI. ΔG. ΔT) cause changes in the equilibrium level of income (ΔY) that are a multiple of the change in spending. This multiple (ΔY / ΔI. ΔY / ΔG. ΔY / ΔT) is known as the multiplier.

The reason for the multiplier effect can be simply stated. Assume the economy is in equilibrium and a form of autonomous spending increases. This increase in spending will be associated with an increase in demand for output in some sectors of the economy, leading to an increase in the incomes of people who work in those sectors. The higher incomes thus generated will stimulate greater spending on the part of those individuals. This added spending will be associated with higher demand in some other sectors of the economy leading to higher incomes there. These higher incomes will in turn stimulate more spending which will lead to higher incomes elsewhere, and so on. In short, spending increases income, which will lead to more spending, which will increase incomes still more, leading to more spending and more income, and so on.

In the simplest model, with induced and autonomous consumption, a MPC = m and autonomous I. G. and T. the important multipliers are:

Consumption spending multiplier $= \frac{1}{(1-m)}$ so that:

$$(\Delta Y) = 1/AC$$

Investment spending multiplier $= \frac{1}{(1-m)}$ so that

$$\Delta Y = \left(\frac{1}{1-m}\right)\Delta I$$

Government spending multiplier $= \frac{1}{(1-m)}$ so that

$$\Delta Y = \left(\frac{1}{1-m}\right)\Delta G$$

Tax multiplier $= \frac{-m}{(1-m)}$ so that

$$\Delta Y = \left(\frac{-m}{1-m}\right)\Delta T$$

STEP–BY–STEP SOLUTIONS TO PROBLEMS

IN THIS CHAPTER, "INCOME DETERMINATION: THE

SIMPLE MULTIPLIER THEORY'

EQUILIBRIUM INCOME DETERMINATION

[Problem 1]

Give the significance of the equilibrium level of output.

Solutions: The equilibrium level of output is that level of output which the economy is capable and willing to sustain. Stated differently, the equilibrium level of output whose production will actually create total spending just sufficient to purchase that output; in other words, the total quantity of goods supplied (NNP) is precisely equal to the total quantity of goods demanded (C+In). This is the only level of output at which the economy is willing to????????????? off the market. Here, The annual rates of production and spending are in balance. There is no over production. Which results in a piling up of unsold goods and therefore cutbacks in the rte of production, nor is there an excess of total spending, which draws down inventories and prompts increases in the rate of production.

[Problem 2]

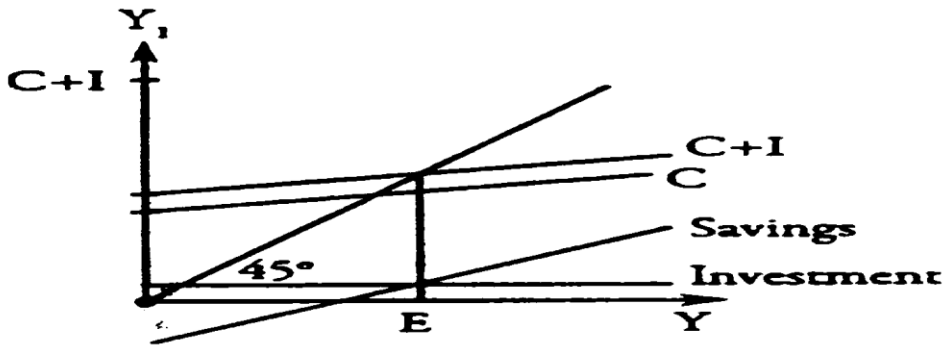
Assuming that equilibrium GNP can be found at the intersection of the savings and investment schedules. show that equilibrium GNP can be found at the intersection of the consumption plus investment schedule and the 45° line

Solutions: Look at the graph below to help visualize the problem Aggregate demand equals consumption plus investment.

$$Y_d = C + I \qquad (1)$$

Aggregate supply = Aggregate income which equals the sum of consumption of savings.

$$Y_s = C + S \qquad (2)$$



In equilibrium aggregate demand equals aggregate supply.

$$Y_d = Y. \qquad (3)$$

i.e,. the intersection of the consumption–investment schedules and the 45° line. Substituting (l) and (2) into (3) results:

$$I = S$$

i.e,. the intersection of the investment and saving schedules.

[Problem 3]

Based on the following hypothetical data, determine the equilibrium level of output.

Savings billions	Investment billions	Aggregate demand (C+In), billions	Unintended investment (+) or disinvestment (-) in inventories
$ -5	$ 20	$ 395	$ -25
0	20	410	-20
5	20	425	-15
10	20	440	-10
15	20	455	-5
20	20	470	0
25	20	485	+5
30	20	500	+10
35	20	515	+15

Solutions: Before deriving the equilibrium level output, lets explain what we meant by unintended investment and disinvestment in inventories so that no unintended (dis—) investment in inventories occurs (equals zero). From the schedule we see immediately that this occurs at an aggregate demand of $470 billion

We know also that in equilibrium.

Saving = Investment

S = I

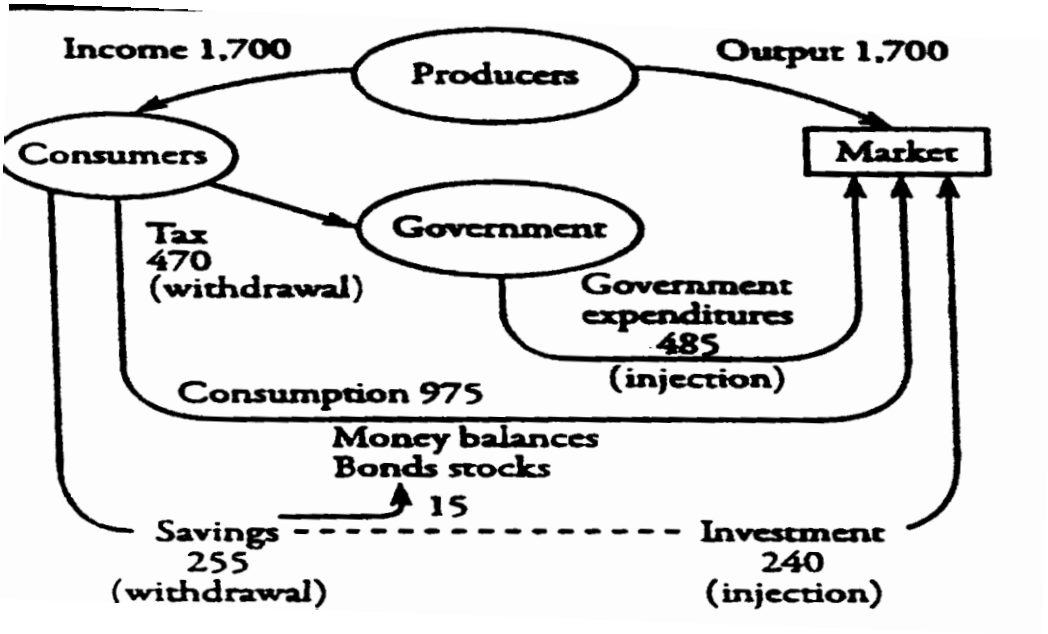
And also this occurs at an aggregate demand of $470 billion. In equilibrium:

Aggregate supply = Aggregate demand

Thus. the equilibrium level of output is $470 billion.

[Problem 4]

The existing level of output of the economy is $1.700 billion. Planned savings are $255 billion, the government plans to levy taxes of $470 billion, and businesses are intending to spend $240 billion. What level of government expenditure will balance the economy at its existing output level, if there are no international transactions?



Solutions: The output of the economy must be matched by the demand for it, if the level of output is to remain at its existing level. The output of this economy is $1.700 billion. The total value of income is, per definition, equal to the total value of output; thus total income is also Y = $1.700 billion. which is a withdrawal. Disposable income, therefore, is

Y_d = Y −T = 1.700 − 470 = $1.230 billion. The disposable income will be used for consumption and saving. Y_d = C + S. Planned savings are $255 billion. thus consumption plans amount to C =Y_d – S = 1.230 – 255 = $975 billion. The total aggregate demand consists of consumption. C. investment. I. and government expenditures. G. when there are non−international transactions that is, when there are no exports or imports, So.

$$Y = C + I + G$$

$$= 975 + 240 + G$$

$$= 1.215 + G$$

For income to remain in output must be demanded in total. Thus,

$$1.700 = 1.215 + G$$

And the government expenditures must be

$$G = 1.700 - 1.215 = \$485 \text{ billion}$$

In order to balance the economy.

This situation is pictured in the flow diagram shown.

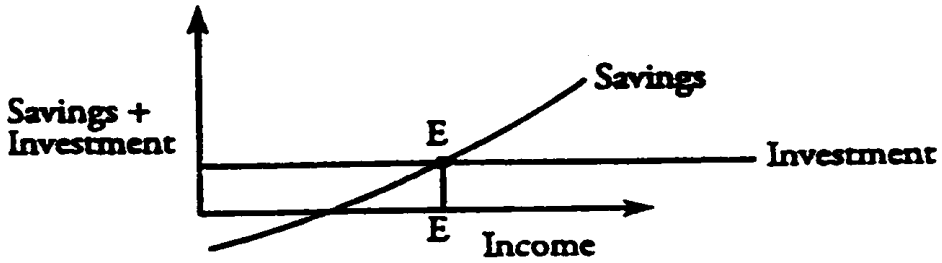
The planned saving and taxes are planned withdrawals from the income−expenditure flows, while the planned investments and government expenditures are planned injections.

Note: Government has a budget deficit. Its expenditures exceed the tax revenues by G − T = 485 − 470 = $15 billion. And savings exceed investments by S − I = 255 − 240 = $15 billion. These $15 billion are diverted into money balances; or into U.S. securities in order to finance the public debt.

[Problem 5]

Economic theory tells us that the intersection of the savings and investment schedules, as shown below, is the equilibrium toward which national income will gravitate. Explain why national income will move toward E if national income is above or below E.

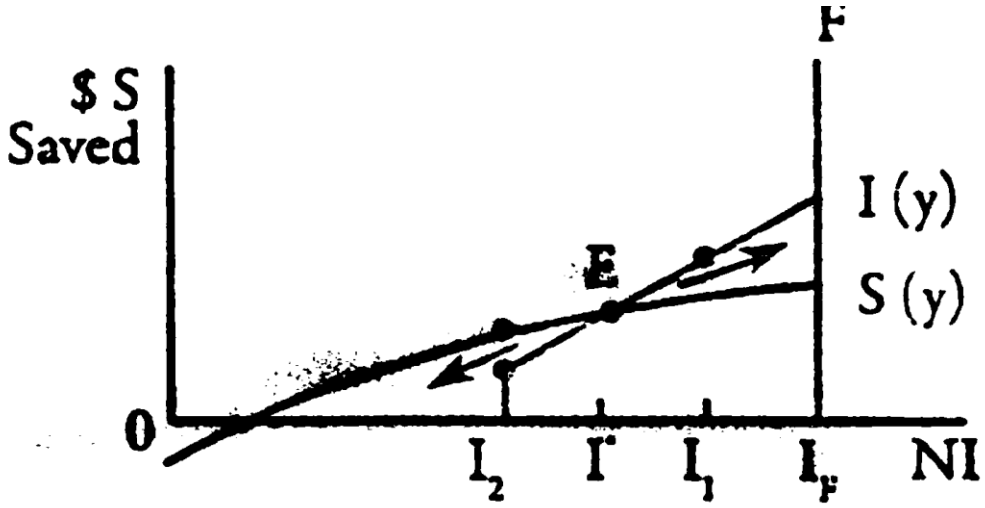
Solutions: Suppose that national income is above point E. At any point above E, savings surpass investment. At such a point, families intend to save more than firms will be willing to go on investing. Firms will then find a lack of customers and inventories pile up. Not wanting co be forced into undesired inventory investment, firms will cut production and lay off workers, moving national income gradually downward toward E.



If national income were below E, families' intended saving falls short of business firm's intended investment, result is consumption being greater than current production. Businesses will find inventories depleting and will then expand production and hire more men, causing national income to increase toward E.

[Problem 6]

A simple economy, in which both the desired saving and the intended investment depend only on the value of the disposable income (the increase rate is assumed to be fixed r = c, MPS >0, MPI > 0), reaches its equilibrium at a point where I = S. Will the assumption MPI > MPS significantly alter the ability of this economy to settle at the equilibrium point? How?



Solutions: The assumptions of the problem tell us in effect that an increase in the aggregate level of national income in our economy will induce higher levels of desired savings and desired investment. The statement MPI > MPS means simply that a given change in NI will cause a larger change in the value of I than it will in the value of S in our economy. Graphically the model can be described in the following way: Consider a point to the right of E where the value of NI is I. (NI is bigger than I^* but smaller than I_F which is a full employment output). As Fig. 1 shows, at this level of aggregate income the desired investment by business firms exceeds the desired savings by households, It means that the aggregate value of injections into the economy represented by the intended investment Consequently the demand for goods produced in the economy will start exceeding the

available supply, the firms' inventories will be depleting and the businessmen will be pushed into further investment and expanded production as a result of excess demand. Therefore, at a point I. our economy will tend to move rightward toward higher investment and employment, and away from E.

Similar analysis will show that at I_2 the economy will tend to contract rather than expand and will again move in the direction away from E. the described above tendencies are represented by black arrows in Fig. 1. Clearly, the assumption MPI > MPS alters the nature of the economy significantly in that it makes it unstable. At any level of NI higher (lower) than I * the natural forces of our economy will make it expand (contract) even further away from the point E where I = S (see Fig. 1). In this situation Point E in Fig. 1 becomes meaningless as an equilibrium point and the economy has no self-stabilizing qualities, find inventories depleting and will then expand production and hire more men, causing national income to increase toward E.

[Problem 7]

How can the IS-schedule be derived from the saving and the investment schedules?

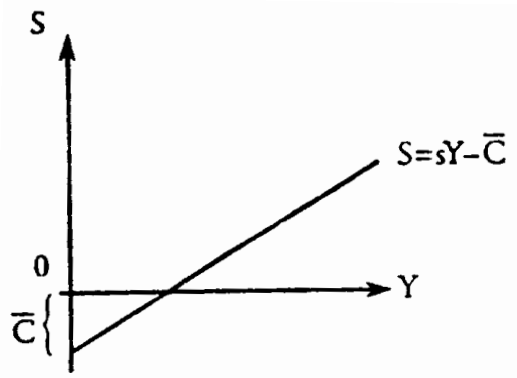


Fig. 1

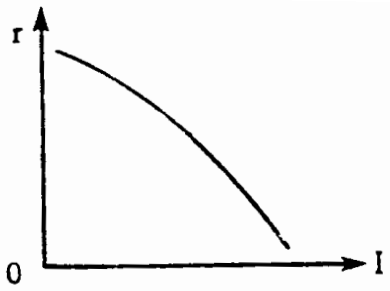


Fig. 2

Solutions: The IS–schedule is the collection of points in the interest rate–income plane that represent equilibria in the commodity market. i.e,. savings = investment: S = I. C + S = C + I. The savings schedule can be described as S = sY – $\overline{C}$ (see Fig. 1).

The investment schedule is I = I (r). (see Fig. 2).

And equilibrium requires that the amount of savings equals the amount of investment. S = I (see Fig. 3).

These three schedules can be combined so that:

sY = $\overline{C}$ = 1(r)

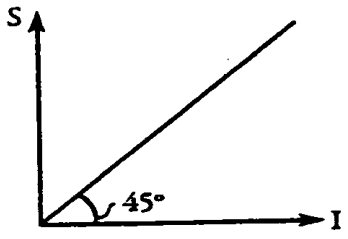


Fig. 3

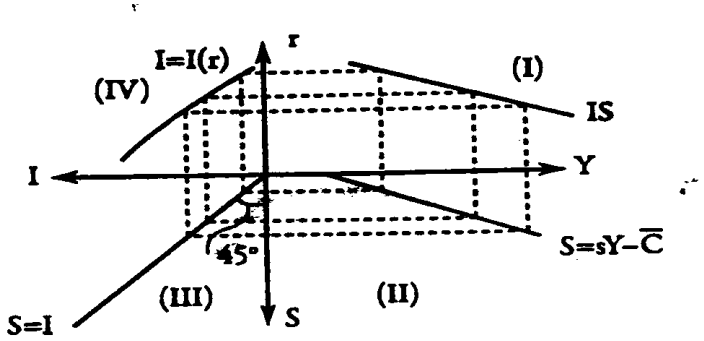


Fig. 4

Or **sY** – $\bar{C}$ $-1(r) = 0$. i.e,. the relationship between Y and r that describes the IS–schedule. (see Fig. 4).

Placing the schedule in quadrant (II), the equilibrium in quadrant (III) and the investment schedule in quadrant (IV) results in the schedule in quadrant (I).

MULTIPLIER ANALYSIS

[Problem 8]

Prove that the multiplier is equal to $1/(1-$MPC$)$.

Solutions: Suppose you purchase an item for $\$100$. This first $\$100$– will result in an increase in income throughout the economy. The $\$100$ will find its way into the hands of other households in the form of wages, rent, interest, and profits. There it will be subject to MPC. Suppose MPC = 0.8. Then $(100)\ (0.8) = \$80$ will be spent. This $\$80$ with contribute to income and will once again pass on to other households. There it will once again be subject to MPC. So $(80)\ (0.8)$ [= $(100)\ (0.8)^2$] = $\$64$ will be spent. The will keep going.

Generalizing, we see that if x is the original expenditure and c MPC. the amount of eventual income. I. can be determined by this formula:

$$I = x + xc + xc^2 + xc^3 + \ldots..$$

$$= x\,(1 + c + c^2 + c^3 + \ldots..)$$

This is an infinite series with c smaller than one; therefore, $(1 + c + c^2 + c^3 + \ldots. = \frac{1}{1-c})$.

Substituting back into the original equation, we get $I = x\left(\frac{1}{1-c}\right)$ or $I = x\left(\frac{1}{1-MPC}\right)$. So we see that the Income generated, I. is equal to the original investment multiplied by $\left(\frac{1}{1-MPC}\right)$. which is therefore the multiplier.

[Problem 9]

In 1978. Government increased investment spending by $5 billion. Given that the MPC (marginal propensity to consume) is 0.75 and assuming further that the economy is initially in equilibrium at $470 billion.

a) Determine its effect on equilibrium NNP;

b) Assuming that instead of an increase by $5 billion, there was a drop in investment by $5 billion, what will happen to equilibrium NNP?

c) Give the significance of your results.

Solutions :This is an application of the Keynesian Multiplier Principle. which is based upon two facts:

1. That the economy is characterized by repetitive continuous flows of expenditures and income wherein the dollars spent by Mr. Clarke are received as come by Mr. Grove. (See Fig. l).

2. That any change in income will cause consumption to vary in the same direction, as, and by a fraction of, the change in income, (See Fig. 2).

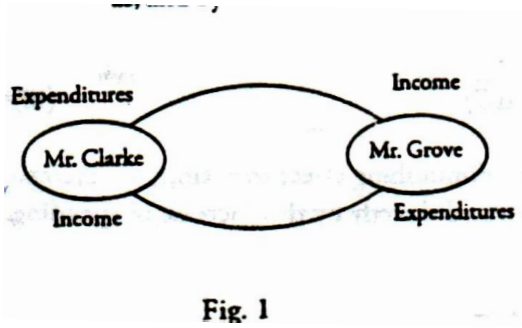


Fig. 1

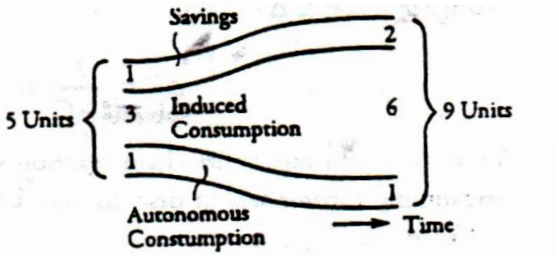


Fig. 2

The Multiplier Principle States that an initial change in the rate of spending will cause a chain reaction which, although of diminishing importance at each successive step, will cumulate to a multiple change in NNP.

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

With a constant MPC. here C = 0.75. an increase in income carries a proportional increase in both, savings and consumption. How this Multiplier Principle is based upon these two facts becomes clear from the following derivation.

Fact 1, the Income Identity, states that total aggregate income = total aggregate spending

= investment + consumption

$$Y = In + C \qquad (i)$$

Fact 2, The consumption Function, states that consumption is proportional to income.

$$C = c.Y + \bar{C} \qquad (ii)$$

Where c = Marginal Propensity to Consume

$\bar{C}$ = autonomous consumption

Substituting (ii) into (i) we derive the following equation

$$Y = In + (c.Y + \bar{C})$$

Bringing all the terms including Y and the left–hand side.

$$Y - c.Y = (1-c)Y = In + \bar{C}$$

Dividing both sides by (I – C) gives

$$Y = \frac{1}{1-C} \left(In + \bar{C}\right)$$

The coefficient $\frac{1}{1-C}$ is called: the multiplier because any change in investment. ΔIn. and in autonomous consumption, $\Delta\bar{C}$. is multiplied by this factor to produce a magnified change in income, ΔY. Thus,

$$\Delta Y = \frac{1}{1-C} \left(\Delta In + \Delta\bar{C}\right) \qquad \text{(iii)}$$

To see that this represents chain reaction with diminishing effect over time, we increase investment. Income win in first instance be affected directly by this increase in spending. (Refer to equation (i)).

$$\Delta Y_0 = \Delta In$$

In the next round, part of the increase in income win be consumed, (no change in autonomous consumption).

$$\Delta C_1 = c.\ \Delta Y_0$$

Thereby increasing income further. This next increase in income is also partly spent on consumption.

$$\Delta C_2 = c\Delta C_1 = c^2\ \Delta Y_0 = c^2\Delta In$$

Etcetera, (the indices indicate time periods).

The ultimate change in income is the accumulated sum of all these changes.

$$\Delta Y_f = \Delta C_1 + \Delta C_2 + \Delta C_3 + \ldots + \Delta In$$

$$= C\Delta I + C^2 \Delta I + C^3 \Delta I + \ldots + \Delta In$$

$$= (I + C + C^2 + C^3 + \ldots)\Delta In$$

$$= \frac{1}{1-C} \cdot \Delta In.$$

It is also seen that the effect over time diminishes because C is a fraction smaller than I. so that the higher powers of C become smaller and smaller, and the effect of the initial increase in investment lessens.

a) Government increased investments by $\$5$ billion. $\Delta In = 5.$

The marginal propensity to consume is 0.75. Using formula (iii) we can calculate the effect of NNP, $(\Delta \bar{C} = 0)$.

$$\Delta Y = \frac{1}{1-C} \Delta In.$$

Substituting the given values in

$$\Delta Y = \frac{1}{1-0.75}. 5 = \frac{1}{0.25} = 20$$

NNP is increased by $\$20$ billion, so the new equilibrium NNP is

$$NNP_{NRU'} = 470 + 20 = 490 \text{ billion dollars.}$$

d) Following the same procedure. $\Delta In = -5$

$$\Delta Y = \frac{1}{0.25}. 5 = -20$$

Thus NNP will decrease by $20 billion and the new equilibrium NNP will be

$$NNP_{NRU'} = 470 + 20 = 450 \text{ billion dollars.}$$

c) From the above results, we can see that a relatively small change in the investment plans of businesses and government or the consumption — saving plans of households can trigger a much larger change in the equilibrium level of NNP. Furthermore, it is also of no coincidence that the multiplier effect ends at the point where exactly enough saving has been generated to offset the initial $5 billion increase in investment spending. It is only then that the disequilibrium created by the investment increase will be corrected. In this case, NNP and total incomes must rise by $20 billion to create $5 billion in additional saving to match the $%5 billion increase in investment spending. Income must increase by 4 times the initial excess of investment over saving because households save one fourth of any increase in their incomes.

[Problem 10]

Why is it that when aggregate demand (C + 1) exceeds aggregate supply, the effect is to increase employment?

Solutions :When the aggregate demand (C + In) exceeds aggregate supply, this produces a signal to increase production and, assuming a direct relationship between production and employment, the increased production results in more employment .This is due to the fact that businessmen are producing at a lower rate than buyers are taking goods off the shelves ;the consequence is an unintended decline in business inventories, signaling that production has to be stepped up . More employment means more income available to spend.

The reverse holds true when aggregate demand is less than aggregate supply. That is, businesses will find that the production of these total outputs fail to generate the levels of spending needed to take them off the market, and an unintended accumulation of inventories will occur, absorbing capital. Being unable to recover the costs involved in producing these outputs, businesses will cut back on their production. This would mean fewer jobs and a decline in total income.

[Problem 11]

Suppose the production process is lengthy and 75% of the capital input at present is dependent on the output in the next period, and 25% is dependent on the output in the period thereafter. The technical capital / output ratio is 3, furthermore, reacts cautiously

to capital shortage; it will only provide capital for 80% of the present gap and 10% of the preceding gap. Can you describe this distributed lag accelerator process?

Solutions: The technical capital/ output ratio is a a = $\frac{K_t}{Y_t}$ 3. However only 75% of the present capital input is reflected in the output in the next period, the rest being reflected in the following period. Thus the K capital required at present is:

$$K_t = 0.75\ aY_{t+1} + 0.5\ aY_{t+2}$$

$$= 0.75 \times 3 \times Y_{t+1} + 0.25 \times 3 \times Y_{t+2}$$

$$= 2.25\ Y_{t+1} + 0.75\ Y_{t+2}$$

The capital required at present is $K_t = 2.25Y_{t+1} + 0.75Y_{t+2}$ and the capital available at present is the capital of the preceding period.

$$K_{t-1} = 2.25Y_t + 0.75Y_{t+1}$$

The time-indices are simply shifted one period backward. The present capital gap is the difference between the capital required and the capital available. Thus

$$K_t - K_{t-1} = (2.25Y_{t+1} + 0.75Y_{t+2}) - (2.25Y_t + 0.75Y_{t+1})$$

$$= 0.75Y_{t+2} + 1.50Y_{t+1} - 2.25Y_t$$

Taking 0.75 before brackets shows the weights given to the outputs between the brackets:

$$K_t - K_{t-1} = 0.75(Y_{t+2}+2Y_{t+1} - 3Y_t)$$

This is the present gap.

To find the preceding gap, shift the time indices again one period backward. The preceding capital gap is then $K_{t-1} - K_{t-2} = 0.75(Y_{t+1}+2Y_t - 3Y_{t+1})$. Investments provide additional apical for 80% of the present gap and 10% of the preceding capital gap, as given. Thus the present investments are present investments are $I_t = 0.80\ (K_t - K_{t-1}) + 0.10\ (K_{t-1} - K_{t-2})$. Substituting the expressions above for both gaps results in the desired distributed-lag-accelerator, expression:

$$I_t = 0.80\ [0.75\ (Y_{t+2}+ 2Y_{t+1} - 3Y_t)] + 0.10\ [0.75\ (Y_{t+1}+2Y_t - 3Y_{t+1})]$$

After substituting for the terms Y_{t+2}. Y_{t+1}. Y_t. Y_{t-1} . the distributed-lag-accelerator is obtained:

$$I_t = 0.6Y_{t+2} + 1.275Y_{t+2} - 1.65Y_t - 1.80Y_{t-1}$$

From this expression note that investments are based partly on expectation of GNP in the future, whereby the nearest future — Y_{t+1} — is more influential than Y_{t+2} two periods ahead; partly on present GNP. Y.;

and partly on past GNP. Y_{t+1}. In this economy GNP must progressively grow, otherwise the investments required become negative. For example, assume that GNP remains constant. i.e..

$$Y_{t-1} = Y_t = Y_{t+1} = Y_{t+2} = Y$$

thus $$I_t = 0.6Y + 1.275Y - 1.65Y - 1.80Y = -1.575Y$$

In other words, in this unrealistically pessimistic economy there is a strong tendency for investments to fill, and head for a deep depression. Only if the behavior of the business changes, towards becoming less conservatives, can this economy be "saved" (The 'conservative' investment behavior can also be explained by capacity imitations of the of the capital goods producing industries; even if business wants to add quickly now capital, it is constrained to do so. There may be a serious backlog in the investment projects).

QUESTIONS FOR REVIEW

Choose the correct answer:

1. The Values of MPC and MPS always add up to I because (a) any two marginal quantities add up to I (b) both MPC and MPS schedules are straight lines (c) every $1 of the national income is either saved or used for consumption (d) the level of investment in the economy is assumed to be constant.
2. The equilibrium point at which I = S makes an economy stable due to the fact that (a) anywhere away from this point the economy is naturally driven towards the equilibrium (b) people want to use their resources productively and therefore reinvest all that they save (c) government stops intervening at this point (d) all of the above.
3. The multiplier can not (a) be equal to 2 (b) be equal to 1000 (c) act to decrease the equilibrium NI (d) be equal to O.
4. If a multiplier is I then (a) consumers save all of their income (b) there is no multiplier effect (c) the aggregate demand is practically (d) nonexistent (d) all of the above.
5. The fact that intended investment exceeds the desired saving suggests that (a) for the simple closed economy aggregate supply is not matched by aggregate demand. i.e.. more is supplied than demanded (b) there will be a tendency to increase employment unless the economy is already at a Rill employment level (c) there is an inflationary gap (d) the economy is in an undesirable condition.
6. When the government expenditure is accounted for in the calculation of national income (a) the new schedule of spending in the economy

will be parallel to the one including only consumption and investment (b) the new spending schedule will lie everywhere above the one including only consumption and investment (c) the equilibrium value of national product will rise (d) all of the above.

7. Suppose total withdrawals from the economy exceed total injections. dis equilibrium can be corrected by (a) inducing additional investment (b) lowering taxes (c) (a) and (b) d) inducing saving in (c) order to produce a paradox of thrift.

8. Actual investment is always equal to actual saving MPI is (a) always equal to MPS (b) probably less than MPC (c) usually positive but less (c) than I (d) negative.

9. The intended investment and desired savings schedules intersect at a point where the equilibrium NP is even than the full employment output. As a result (a) there is an inflationary gap (b) the prices are likely to rise (c) nothing definite can be said (d) (a) and (b).

10. The recessionary gap is likely to have a stronger impact on the economy when (a) MPS is small (b) MPC is small (c) MPS is large (d) (b) and (c).

11. Given a certain interest rate (r_0) the point of equilibrium in both the product market and the money market is: (a) where the IS curve crosses the LM curve at r_0 (b) where the IS curve just crosses the LM curve (c) where the LM curve is decreasing (d) where the LM curve and IS curve come close to r_0.

12. If aggregate supply exceeds aggregate demand in a private (non-government) economy. then: (a) consumption plus investment equals

(b) savings investment (c) is greater than intended investment(d) national output will remain at break-even level (e) none of these.

13. An alternative to the aggregate demand- aggregate supply approach in determining NNP is the: (a) income and wealth approach (b) leakages-injections approach (c) employment-wage approach (d) import-export approach.

14. An inflationary gap exists if: (a) the aggregate demand schedule crosses the 45-degree line above the employment NNP (b) the aggregate demand schedule crosses the 45-degree line below equilibrium at the full employment NNP (c) intended investment is greater than savings at the employment NNP (d) none of the above.

Fill in the blanks:

1-The (de)inflationary gap is measured at the _____ .

2-Investment and government expenditure are examples of _____

3-The intersection of a consumption schedule with the _____ occurs at a point where aggregate saving is equal to 0.

4-When the planned investment is consistently below actual investment _____ are building up.

5-The _____ of goods and money is a pod practical explanation of the multiplier effect.

6- _____ takes place when an increased desire to save causes the reduction of the actual saving reduction of the actual saving.

7- Thriftiness is more appropriate and should be encouraged in the _____ economy. not in the _____ economy.

8- Only _____ increases in the NI can occur when the economy is producing at Rill employment.

9- _____ is a major factor determining the value of the multiplier in a dosed economy characterized by a constant investment function.

10- When the economy is at a break-even point (nothing is saved) the value of the multiplier approaches _____.

Determine whether the following statements are true or false:

1. When the economy is at equilibrium MPC = MPS necessarily holds
2. The simple closed economy contains self-equilibrating forces which push the national income towards a level where aggregate desired savings and aggregate intended investment are equivalent.
3. The terms gross national product and disposable income are interchangeable by definition.
4. Since actual always equal actual investments the real economy is always at equilibrium. at theoretically.
5. A rising investment function ensures that the equilibrium level of national income will be reached at appoint where the schedule intersects the investment schedule from below.
6. For a simple closed economy with a constant level of income MPS = MPC is another way of saying that $1 invested into the economy will become a $2 addition to its disposable income.
7. If a rising investment function is included in the calculation of the multiplier effect, its value, as a result, has to increase.

8. The equilibrium level of gross national product ensures that the economy is stable; therefore, it is optimal and desirable for any economy to produce at equilibrium.
9. Everything else unchanged, a bigger value of MPI makes me paradox of thrift more visible.
10. Unless the national income is at equilibrium, some inflationary or deflationary gap will exist.
11. With a constant level of investment, the economy is always in equilibrium.

Chapter 4

FISCAL POLICY AND THRIFTINESS

Chapter 4

FISCAL POLICY AND THRIFTINESS

Fiscal policy is the use of government spending and tax policy (the budget or the fiscal) to achieve social goals. This social goal falls into three categories:

Allocational, distributional, and stabilization. Allocational goals refer to the impact of government budget policy on society's allocation of resources. Government provides public goods, regulates externalities, and can influence private spending through incentives built into the tax code. Distributional goals refer to the impact of budget policies on the distribution of income in society. All government policies have different impacts on different groups of people. Stabilization goals refer to government's impact on inflation. Unemployment, and economic growth.

A major debate in the discipline is between the classical economists (and their contemporary descendants such as the monetarists and rational expectations school) and the Keynesians. The classicals believe that market economies tend to be efficient, equitable, stable, and capable of achieving a rapid rate of growth. Consequently, there is little need for government in involve itself too deeply in the workings of

the economy. Keynesians believe market economies are prone to inefficiency, inequity, instability, and stagnation. Consequently, active government is called for to deal with these problems.

More specifically with respect to the stabilization goal of government, the classical view is that while the economy may be subject to some economic fluctuations — periods of mild recession and inflation — fiscal policy is unlikely to have much success in smoothing things out, and may, in fact, make the fluctuations more severe. Keynesians believe that more severe fluctuations — periods of boom and bust — are a natural part of the working of the economy. Society should make a commitment to the use of fiscal policy to combat recession and inflation.

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 $Y_d = C + I + G$ makes clear. Tax policy has its impact aggregate demand through its influence on consumer disposable 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 the only tax is or. Consumption and is of the lump sum variety (every household pays the same absolute amount), the equations for the effect of government spending tax policy. And balanced budget policy are (let c be the MPC).

Government Spending

$\Delta Y = \left(\frac{1}{(1-C)}\right) * \Delta C$. where $\frac{1}{(1-C)}$ is the government spending multiplier. Taxation

$\Delta Y = \left(\frac{1}{(1-C)}\right) * \Delta T$. where $\frac{-C}{(1-C)}$ 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 impacts on the budget deficit.

Balanced Budget

$\Delta Y = I * \Delta B$. where I 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.

The type of fiscal policy analyzed above is known as discretionary policy. Discretionary policy occurs when government consciously sets spending and taxes to achieve particular goals. In reality, setting fiscal policy is no simple task for a number of reasons. For one thing, fiscal actions have their affect in the future, so wise policy requires the ability to forecast accurately, something we do not do very well. Second, the actual budget process is slow and cumbersome. Our political process is incapable of making the quick decisions sometimes required. Third, we do not know the actual value of the parameters needed for the various multipliers. We only have imprecise estimates. Fourth, fiscal policy is ultimately an exercise in political decision-making, with all the pitfalls that phrase implies. Frequently allocational, distributional, and sometimes, purely political goals can interfere with wise stabilization policy.

Fortunately, we do not have to rely on discretionary fiscs policy. Some??? of out fiscal system work automatically to stabilize the economy. There are called automatic stabilizers. An example would be our system of unemployment compensation. Assume economy fails into a recession. Automatically the system begins paying out benefits to unemployed workers, allowing them to maintain a level of spending higher they could achieve in the absence of benefits. This prevents the recession from being as severe as it might otherwise be. During expansion, the level of benefits falls and government collects tax revenues to fund the system during the next recession. This decline in benefits and increase in tax collections restrains the growth of spending. Other examples include income taxes and welfare spending. Automatic stabilizers cannot completely offset an economic fluctuation, but they can make it less severe than it might otherwise be, and they have the added advantage of working without requiring immediate human judgment.

An important point is that the level of government spending and taxation cannot be set exactly by the government. The state of the economy, to the extent that it influences required expenditures and the government's ability to collect taxes, also influences the budget. This means that one cannot simply look at the actual level of the government

was trying to accomplish. A deficit may have been the result of deliberate policy, or simply a weak economy which reduced tax collections and raised benefit payouts. A way to avoid this problem is to use the Full Employment Budget concept. The Full Employment Budget estimates what government spending and taxes would be if the economy were at full employment. This allows observers to compare government budgets over any two years and determine the direction of policy. Regardless of the state of the economy, a more expansionary policy will lead to an increase in the full employment deficit between the two years.

A consequence of an activist Keynesian fiscal during a time of recession will be a budget deficit. It is clear that in the Keynesian view, deficits are not to be feared. The bigger problem is unemployment resources. To Keynesians, since budget deficits are mainly internal debts, there is no danger of national bankruptcy. A valid concern with budget deficits is that they may "crowd out" capital formation. If government borrowing drains away savings that could have gone for investment, there will be less capital formation, and the economy will grow productive economy. Keynesians do not fear this scenario because deficit spending should only occur during periods of recession, periods when there is too much saving and to little spending. Deficit spending puts

saving into circulation. reviving the economy. And creating an environment that will be more conducive to investment.

During periods of inflation, the government can run a surplus and play back the debt. In reality, our debt has grown over time, suggesting that restraining deficit spending is not an easy task.

STEP-BY-STEP SOLUTIONS TO PROBLEMS

IN THIS CHAPTER,

"FISCAL POLICY AND THRIFTINESS"

BUDGETARY EXPENDITURE PATTERNS

[Problem 1]

What is fiscal policy?

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

The national income identity states

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

Where C = Consumption, I = Investments, G = Government expenditures, 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.

[Problem 2]

What are the three types of budget used by the U.S. government? Indicate the reason for their existence. Which is the most indicative of macroeconomic policy problem?

Solutions :The three of budget used by the US . government are the Unified Budget, the National Income Accounts Budget and the Full Employment Budget

The Unified Budget shows the cash flows of the U.S. Treasury, The trust accounts, such as those of the Social Security Administration, are included. Also shown in the amount lent by the various federal credit agencies for housing, agriculture, and international assistance. The net lending equal to the excess of loan disbursements over loan repayments, has become more important because of the expansion in the activities of the federal credit agencies.

The National Income Accounts Budget is based on the conception of output used in the national income accounts. All types of in000e-ceneratinc purchases of goods and services, compensations for the government employees, and transfer payments that enhance the purchasing power of the private sector are included. Net lending, however is not included in the expenditures, as it is in the unified budget. In addition, the purchase and sale of existing real and financial assets are excluded because they do not represent current income or production.

The Full-Employment Budget shows the estimated to and expenditures of the national income account budget adjusted to what that would be were the economy operating at a steady and high level of employment.

If the Full-Employment Budget shows a growing deficit, it can be supposed that the federal government has altered its tax and expenditure programs to make fiscal policy stimulating; if it shows a growing surplus, the government has adopted a more restraining fiscal policy. The Unified and National Income Accounts are affected by changes in the level of economic activity (see, for example, the explanation of the 'fiscal drag'). Tre High. Employment Budget provides a measure of fiscal policy that does not reflect these changes; it is a better measure of the direction of fiscal policy. But what is considered to be 'full employment: 4. 5 or 7% unemployment?

[Problem 3]

Discuss the classical economists' contention that the level of output which business producers can sell depends not only upon the level of total spending but also upon the level of product prices. Given the above argument, what would be the repercussion upon the resource market, particularly labor?

Solutions: The classical economists argued that the level of output is dependent also upon the product price level and not only upon the level of total spending. This is tantamount to saying that even if the interest rate should somehow temporarily fail to equate the amounts which households wanted to save with the investment intentions of business, any resulting decrement in total spending would be offset by proportionate declines in the price level. This can be illustrated clearly by the following example. Suppose $20 will buy four shirts at $5. $10 will buy the same quantity of shirts only if their price should fall to $2.50. Therefore, if it happens that households somehow managed to succeed in saving more than businesses were willing to invest, the consequent diminution in total spending would not result in a decline in real output, real income, and the level of employment if product prices would decline in proportion to the decline in expenditures. The classical economists furthermore used competition among the sellers as the factor which would guarantee its occurrence. As declines in product became general, competing producers would lower their prices to dispose of accumulating surpluses. Stated differently, the result of saving would be to lower prices; and lower prices, by increasing the value of the dollar, would allow nonsavers to

obtain more goods and services with their current money incomes. Saving would therefore lower prices, but not output and employment.

This would boil down to the question whether the above argument doesn't ignore the resource market. Wouldn't businesses find it unprofitable to accept lower product prices in the face of declining demand? As product prices decline, won't resource prices–particularly wage rates–have to decline significantly to permit businesses to produce profitability at the now lower prices?

All of these questions were answered by the classical economists by saying that wage rates must and would decline. General declines in product demand would e reflected in the decrease of the demand for labor and other resources. The immediate consequence for this would be a surplus of labor, that is, unemployment, at the wage rate prevailing prior to these decline in the demand for labor. Producers, though not willing to employ all workers at the original wage rates, would find it profitable to employ additional workers at lower wage rates. Those workers unable to locate employment at the old higher wage rates could find jobs at the new lower wage rates.

A question might be raised here of whether workers are willing to accept lower wage rates. This was answered by saying that competition among unemployed workers would guarantee it. In competing for scarce jobs, idle workers would bid down wage rates until these rates (wage costs to employers) were so low that employers would once again find it profitable to hire all available workers. And this would happen at the new lower equilibrium wage rate. The classical economists therefore concluded that involuntary unemployment was impossible. Anyone who was willing to work at the market-determined rate could readily find employment.

[Problem 4]

What is the position of the New left on Keynesian fiscal policy?

Solutions: Although the radicals acknowledge that increased government spending does reduce unemployment, they contend that in the United States such spending has been channeled into unproductive activities.

The New Left asserts that Keynesian fiscal policies have contributed to the consolidation of a quasi-military state, imperialist expansion.

wasteful private consumption. and continuing inequality of income distribution.

Government is severely restricted in its expenditure alternative. Disbursement of funds to poor people would Sustain an increase in consumption spending, and thus in aggregate demand, but capitalist ideology sees this weakening work incentives and social discipline. Entrenched interests oppose many possible public work Projects, such as the upgrading of housing conditions in urban slums, or improving the urban transit system. Also, government investment in and ownership of factories and other productive facilities is strongly opposed by capitalist interests. The only way out seems to be an increase in spending on the ultimate waste Products: military equipment and operations. In every year since World War II, the United States has spent more on national defense than any other nation.

It is also charged that these extensive defense expenditures have resulted in a powerful alliance between the Defense Department, the armed services, ad the major corporations that supply them with as. There appears to be a close connection between this military-industrial complex and American foreign policy. Particularly in developing nations. Big business, the international corporations, seeks to maintain the conditions of low-cost

labor and raw materials in these countries by thwarting indigenous movements toward industrialization. Frequently the local governments, comprised of the land-owing elite, are supported by the American corporations and their ally, the US. government, in order to maintain the status quo.

The critics also argue that the increase in consumption induced by an expansive fiscal policy has not always led to an increase in the of life. The possibilities created by an increase in productivity, such as a shorter work week, more leisure, and an improved environment, are forgotten in the rush for an ever-increasing quantity of goods and services.

Finally, the emphasis on aggregate economic performance obscures many of the important structural features of the American society. An overall 4 percent unemployment rate, considered to be the 'acceptable' natural rate, hides an unemployment rate of 8 percent for the blacks, 15 percent for all teenagers, and 40 percent for black teenagers. Aggregate policies appear to fail to solve the problems of discrimination and poverty.

The Radicals also point to the inequities of the tax system: the sales and property taxes of the state and local governments are highly regressive. Many of the aggregate fiscal spending and taxing programs

do not assist in the redistribution of income but aggravate the existing inequality in income distribution.

Competition in the labor market ruled out involuntary idleness. However, the classical economist's forgot, so to speak, that wages are not only costs of production for the employer who decides how much he will produce, but income for the workers, to be used for their expenditures. i.e.. for the aggregate demand.

[Problem 5]

What is the effect of an increase in government spending, where no change in taxes takes place and the deficit is financed by borrowing?

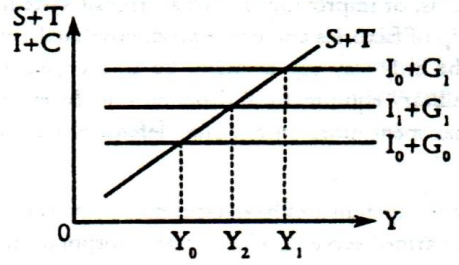


Fig. 1

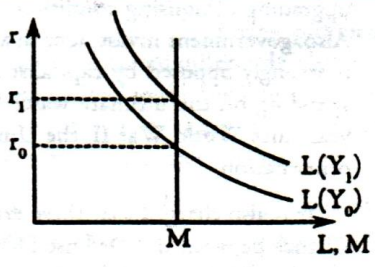


Fig. 2

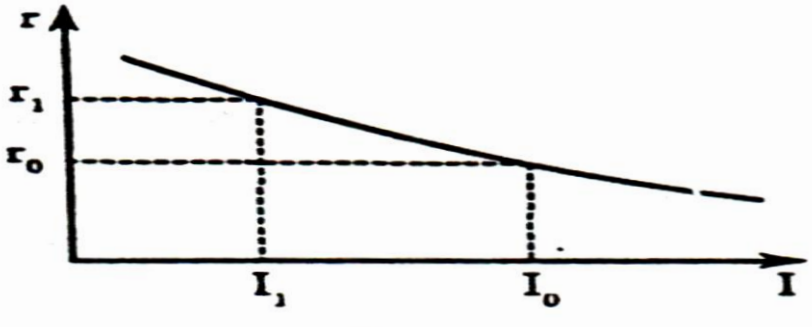


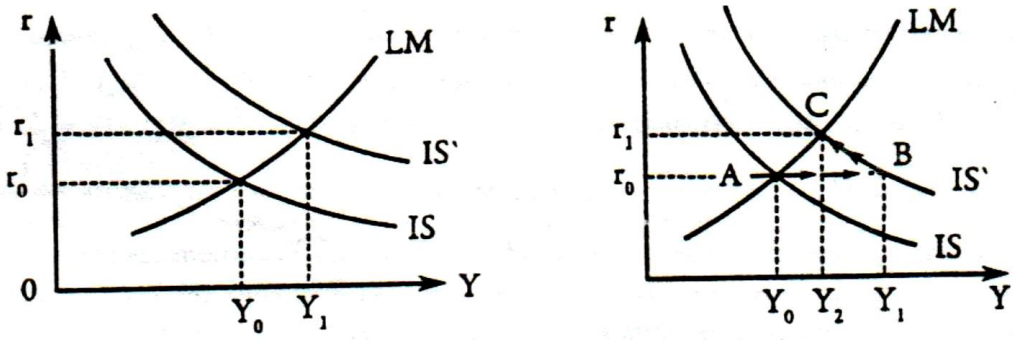
Fig. 3

Solutions: The initial effect of an autonomous increase in government spending is an increase in aggregate demand, triggering a multiplier process, (See fig, l).

In this graph Y denotes GNP; (I + G) is the total of investment I and government spending G; and S + T is the total of savings S and taxes T. where the two graphs (I + G) and (S + T) intersect exists an equilibrium; C + I + G = C + T + S between total expenditures and total 'revenues'. When government spending is increased from G_0 to G_1 equilibrium income rises from initial Y_0 and Y_1. The deficit is financed by borrowing in the financial markets, and therefore the money supply is unchanged, (See Fig, 2). L is the liquidity preference, which is dependent on income. L = L(Y); M is the autonomous money supply as determined by the monetary authorities; and r is the rate of interest.

The increase in income, induced by the increased government expenditures, results in an upward shift of the liquidity preference schedule, because people want to hold larger cash balances due to the increased number of their transactions. The rise in the rate of interest, from r_0 to r_1. resulting from this increased demand for money, causes a reduction in planned investments, (See Fig 3). This graph depicts the marginal efficiency of investment.

The reduction in investment means a reduction in aggregate demand and. in terms of Fig, I. a downward shift in the I + G schedule. The final outcome is the equilibrium income level $Y_{2.}$ which is higher than the original level of Y_0. but lower than the expanded income level without the interest effect. This problem may also be analyzed in the IS – LM framework (See Fig, 4).



The IS–schedule represents the points of equilibrium in the commodities markets (So I + G = S + T). while the LM–schedule represents the points of equilibrium in the financial markets (so L(Y) = M). The increase in government spending and its consequences shift the IS–schedule to the North–East, thereby simultaneously increasing the national income and the rate of interest. For clarity, the steps involved are analyzed. The increase in government spending shifts the IS–schedule to the right when the interest rate is fixed, (See Fig, 5).

The equilibrium shifts from A to B. and income from Y_0 and Y_1. Then the interest rate is allowed to rise from r_0 and r_1; equilibrium shifts back from B to C. and equilibrium income from Y_1 to Y_2.

The precise effect of the fiscal policy depends on the shapes of the IS and LM schedules.

[Problem 6]

Suppose the government seeks to achieve a balanced budget by levying taxes of $100 billion and making expenditures of $100 billion. How will affect NNP if MPC = 0.8?

Solutions: The levying of a tax will reduce NNP, while expenditures by the government increase NNP. Here it is necessary to find the joint effect of the two.

First, find the multiplier by the formula

$$\text{Multiplier} = \frac{1}{1-MPC}$$

$$= \frac{1}{1-0.8} = \frac{1}{1-0.2} = 5$$

Then, to evaluate the effect of the increase in expenditures, use the definition of the multiplier:

$$\text{Multiplier} = \frac{1}{1-MPC}$$

$$\Delta NNP = \Delta G \times \text{multiplier}$$

$$\Delta NNP = \$100 \text{ billion} \times 5$$

$$\Delta NNP = \$500 \text{ billion}$$

To evaluate the effect of the increase in taxes. It is essential to realize that consumption will not fall by the full amount of the tax. Instead, savings will drop somewhat. To find out the effect of the tax on consumption, multiply the droop in disposable income by the MPC.

Drop in private consumption = (Drop in Disposable Income) (MPC)

$$= (\$100 \text{ billion})\ (0.8)$$

$$= \$80 \text{ billion}$$

Then, applying the multiplier to the drop in consumption yields:

$$\Delta NNP \text{ (decrease)} = \Delta \text{ Consumption} \times \text{Multiplier}$$

$$\Delta NNP = \$80 \text{ billion} \times 5$$

$$\Delta NNP = \$400 \text{ billion}$$

Therefore the increase in government expenditures of $100 billion raises NNP by $500 billion, and the levying of a tax decreases NNP by $400 billion. The net effect will be an increase of$100 billion in NNP.

THE PUBLIC DEBT

[Problem 7]

Is the fact that there is a public debt of $350 billion a reason for concern? Discuss.

Solutions :The absolute size of the public debt does not tell us anything about its burden .The size of any debt must be considered in relation to the size of the income from which the interest on the debt and the repayment of the principal has to be finished

In 1935 the gross federal debt was only about $35 billion, one tenth of the current debt. Gross national product was $72 billion. Thus in 1935 the income/debt ratio, or debt turnover ratio, was 72/35=2.06. Nowadays national income is about $980 billion. Thus the income/ debt ratio has to 2.8. The present economy can better afford to carry this debt than in the 1930s. The interest paid by the Federal government is about $18 billion. The whole of the American debt is held internally: The American people owe the money to themselves. Paying off the internally held dept does not therefore mean a change in the total wealth of the nation, but it will probably result in are distribution of this wealth.

Wars have been chiefly responsible for the large size of the debt, and they imposed most of their burdens on those who were living at the

time: productive factors were used for the production of military goods instead of civilian goods and services. No additional capital goods were supplied to increase the production for the succeeding generation. Not the public debt, but the real economic sacrifice, forms the real burden.

[Problem 8]

Suppose the government runs a budget deficit of $30 billion, and the FED does not want to increase the money supply by more than $40 billion. By how much must the national debt increase?

Assume that the legal reserve requirement of the banking system is 20%.

Solutions: Budget deficits of the government, i.e,. the surplus of expenditures over taxes. can be financed in two ways: by newly created money, and by borrowing, Symbolically,

Budget deficit = G – T = B + M.

Where G = government expenditures.

T = Taxes.

B = borrowing, and

M = newly created money.

The borrowing (B) by the government adds to the national debt. The Treasury sells government securities to the public to raise the needed

finds. An increase in national debt adds to the burden of the interest to be paid by the government; and the Treasury will try to keep this burden small.

The second way to finance the government deficit is by creating money, either in the form of demand deposits or in the form of paper notes ('banknotes'). In this care the Treasury sells the securities, but these are immediately purchased by the Federal Reserve bank in the open market. Thus no additional borrowing from the public takes place, but the money supply increases. The Treasury and the FED work in tandem to fiancé to the budget deficit by money creation.

The consolidated balance sheet of the twelve Federal Reserve banks shows the following changes when, for instance, $1 billion in government securities is sold by the Treasury and bought by the Federal Reserve banks.

Consolidated Balance

Assets	**Liabilities**
U.S government securities + $1billion	**Federal Reserve notes $0.5 billion** **U.S. Treasury d sits $0.5 billion**

It has been assumed that half of the $1 billion is used to add to the Federal Reserve notes and half to add to the U.S. Treasury

deposits; ocher allocations are possible. But the effect is that it contributes to high-powered money, i.e.. to the reserves that the commercial may hold with the FED.

The legal reserve requirement is 20%: each $\$5$ deposit must be supported by at least $\$1$ reserves. When the total of the deposits, which form part of the money supply are allowed to increase by $\$40$ billion, then the reserves (i.e,. the high-powered money) must rise at least by $M = 0.20 \times 40 = \$8$ billion.

The budget deficit $= 30$ $= B + M$

$= B + 8$

Thus the national debt must increase by

$$B = 30 - 8 = \$22 \text{ billion}$$

This is an example of a rather forceful expansionary. Not only does the government deficit boost the economy through the multiplier process; in addition there is an increase of $\$40$ billion in the money supply. One of the reasons why the Treasury-FED would opt for this policy is that the increased money supply would keep the interest rates low. Otherwise the increased economic activity resulting from the stimulus of the budget deficit would increase the demand for money and drive the interest rates

upward; in which case the stimulus of the budget deficit would be partly offset by a reduction in planned investments.

[Problem 9]

How can the debt management of the U.S. Treasury contribute to economic stabilization?

Solutions: Debt management consists of the decisions as to what kind of securities to issue — short-term, intermediate-term, or long-term, i.e,. the composition of the U.S. debt.

To have a stabilization effect, the Treasury must issue short-term debt when there is a recession and long-term debt when there is too much inflation.

The sale of short-term securities is order to finance a deficit increase the supply of liquid assets, which tends to lower long-term interest rates. This is because the financial institutions will buy more long-term bonds when they have more liquid assets. This drives the prices of these bonds upward and their interest yields will fill. If the economic effect of this decline is long-term interest rates offsets the effect in short-term rates, the net effect is expansionary.

The sale of the long-term bonds tends to lower the prices of these bonds and increase interest rates. not only for the long-term bonds but also for the other long-term investments that compete with bonds. The higher interest rates discourage private borrowing and investment. This has a restraining effect on the economy. Historically, however, the U.S. Treasury has not managed its debt in this way. It is hesitant to create long-term debt in times of prosperity when interest rates are high, because this would contribute to its interest service costs.

[Problem 10]

How can the public debt exert an inflationary pressure on the economy?

Solutions :The Treasury finances the public debt by selling US . Securities .These government securities are very liquid assets ;they can easily be converted into money .Consequently, the buyers of these securities tend to allot more of their current income to consumption spending than they would if their savings were tied up in relatively non-liquid real estate or private business investment s in stocks, obligations, consumer durables, etc. And such an increase in consumption spending adding to the aggregate demand, can have an inflationary pull

A second reason for the inflationary influence of the public debt is also connected with the liquidity of the securities. The huge amount of securities tin the hands of households, securities that can easily be converted into cash, represents a backlog in buying power that may be converted at inconvenient times. Inflation will normally induce this conversion if it appears more rational to households to buy at the present explain why they expect inflation to continue.

These two tendencies explain why every addition to the public debt may create extra fuel for inflation.

FISCAL POLICY AND TAXATION

[Problem 11]

A country which previously had no tax system must decide if it will introduce a proportional, progressive; or regressive tax system. It is considered important that the stability of the economy is maintained. Discuss and illustrate which system should be introduced, ignoring only political implications. Assume that the proposed regressive system is a lump-sum tax system, collecting $20% billion in taxes at all levels of NNP: the proportional system has a rate of 20%; and the progressive system has a tax rate of NNP; the proportional system has a rate of 20%; and the progressive system has a tax rate of zero at the level of NNP =

$100 billion, which a 10 percent increase for every additional $100 billion.

The consumption schedule is as follows:

NNP (billions)	Consumption (billions)
$100	120
200	200
300	280
400	360
500	440
600	520
700	600

Solutions: The stability of the economic system is dependent on the size of the (Keynesian) multiplier, and the rate at which the tax revenues vary directly with NNP (= Net National Product). Government budget deficits will stimulate the economy but an increasing NNP will gradually eliminate that budget deficit. Similarly, a budget surplus will exert a deflationary influence, but the decreasing NNP will, by diminishing tax revenues gradually eliminate the budget surplus.

When the economy has no tax system, the marginal propensity to consume can be determined from the given consumption schedule.

???? is to be noted from this schedule that every $\$100$ billion increase in NNP (ΔY) is accompanied by an $\$80$ billion increase in consumption (ΔC); thus the marginal propensity to consume.

$$C = \frac{\Delta C}{\Delta Y} = \frac{80}{100} = 0.8$$

We may plot the schedule in a graph (See Fig. 1).

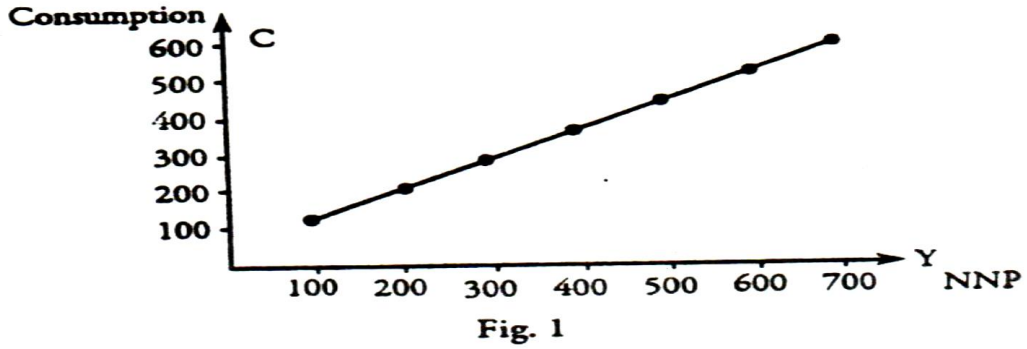


Fig. 1

The Keynesian multiplier is $\frac{1}{1-C} = \frac{1}{1-0.8} = 5$

For this country without a tax system. It will first be determined why a lump-sum tax system is called regressive. Suppose a $\$20$ billion tax is imposed at all levels of NNP and calculate the tax rate at all levels of NNP.

NNP (billion). Y	Lump Sum Tax. T	Tax Rate t	Disposable Income (Y − T)	Consumption C = c (Y— T) + $\bar{C}$
$100	20	0.20	80	104
200	20	0.10	180	184
300	20	0.06	280	264
400	20	0.05	380	344
500	20	0.04	480	424
600	20	0.03	580	504
700	20	0.03	680	584

Notice that the tax rates for the higher levels of NNP are lower than for the lower levels. and therefore a lump-sum tax qualifies as a regressive tax.

Disposable income (Y - T) is also calculated. Assuming that the marginal propensity to consume remains unaffected by the imposition of the lump-sum tax system, consumption may be calculated. First, autonomous consumption, which is unrelated to income, is determined from the original consumption schedule. A reduction in income by the imposition of the tax system does not affect this. The MPC = 0.8; thus out of an income of $100 billion. 0.8 × $100 billion = $80 billion is induced consumption. The actual level of consumption is $120 billion. however; thus the difference, $120 billion - $80 billion = $40 billion is the

autonomous consumption $\bar{C}$. (This result can be calculated from the other levels of NNP, and $\bar{C}$ remains the same). Thus, total consumption, the sum of autonomous and induced consumption, can be calculated using the formula C = c(Y − T) + $\bar{C}$

This equals C = c(Y − tY) + $\bar{C}$

= c(1 − t)Y + $\bar{C}$

Where t is the tax rate.

The Keynesian multiplier in this case $K = \frac{1}{1-c(1-t)}$ .using c = 0.8 and the tax rates already calculated, it can be seen that with a lump-sum tax the multiplier is no longer constant for all levels of NNP, but increases with NNP. The calculation of the multiplier is as follows:

NNP	1 − t	c(1 − t) =0.8(1 − t)	1 − c(t –t)	$K = \frac{1}{1-c(1-t)}$
100	0.80	0.64	0.36	2.8
200	0.90	0.72	0.28	3.6
300	0.94	0.75	0.25	4.0
400	0.95	0.76	0.24	4.2
500	0.96	0.77	0.23	4.3
600	0.97	0.78	0.22	4.5
700	0.97	0.78	0.22	4.5

Notice that the multiplier is more powerful at the higher levels of NNP than at the lower levels of NNP. The budget deficit (surplus) remains constant at all levels of NNP under this lump-sum tax system: $\bar{G} - \bar{T} = \bar{G} - 20$. where $\bar{G}$ government expenditures. So there is no built-in stabilizer in this system. And as NNP increases it can be seen chat small distortion. Such as a fall in investments because of pessimistic expectations, have wider repercussions because of the larger multiplier.

In summary, the lump sum tax system is destabilizing over time when NNP gradually increases. Under the proportional tax system with a tax rate of 20% at all levels of NNP, the consumption schedule is calculated as follows:

NNP (billion). Y	Tax Rate T = 0.20	Proportinal Tax T	Disposable Income (Y − T)	Consumption C = c (Y— T) + $\bar{C}$
$100	0.20	20	20	104
200	0.20	40	160	168
300	0.20	60	240	232
400	0.20	80	320	296
500	0.20	100	400	360
600	0.20	120	480	424
700	0.20	140	560	488

In this case. the tax rate remains constant but the taxes collected increase with an increase with an increase in NNP.

The Keynesian multiplier remains constant in this case because both the marginal propensity to consume and the tax rate are constant: thus

$$K = \frac{1}{1-C\,(1-t)} = \frac{1}{1-0.8\,(1-0.20)} = \frac{1}{1-0.8\times 0.8} = \frac{1}{1-0.64} = \frac{1}{0.36} = 2.8$$

A proportional tax system tends to be stabilizing because a budget deficit, (surplus) decreases in size when income increases, (decreased), (See figure 2).

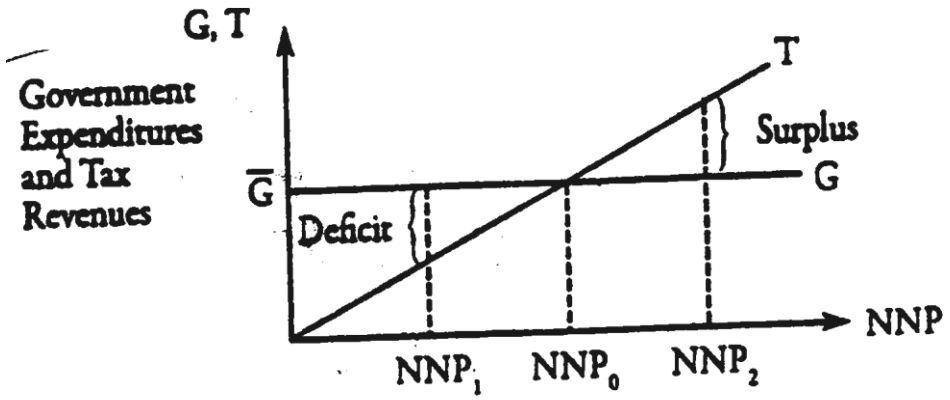


Fig.2

At income level NNP_1 the economy experiences a deficit which will be eliminated when NNP increases, and at income level NNP_2 there is a surplus which will be eliminated when NNP decreases.

The Keynesian multiplier remains constant; thus distortions have the same effects on high as well as low levels of NNP. Ir. summary, a proportional tax system is stabilizing.

Finally, a "progressive" tax system will be discussed. Again calculate the consumption schedule:

NNP (billion). Y	Tax Rate T = 0.20	Proportinal Tax T	Disposable Income (Y − T)	Consumption C = c (Y— T) + $\bar{C}$
$100	0.00	0	100	120
200	0.10	20	180	184
300	0.20	60	240	232
400	0.30	120	280	264
500	0.40	200	300	280
600	0.50	300	300	280
700	0.60	420	280	264

Under the progressive tax system, when income increases, the tax rate as well as the taxes collected increase. The Keynesian multiplier is no longer constant but decreases with increasing NNP as can be seen from the following calculations.

NNP	1 − t	c(1 − t)	1 − c(1 −t)	$K = \frac{1}{1 - c(1 - t)}$
100	1	0.8	0.20	5
200	0.90	0.72	0.28	3.6
300	0.80	0.64	0.36	2.8
400	0.70	0.56	0.44	2.3
500	0.60	0.48	0.52	1.9
600	0.50	0.40	0.60	1.7
700	0.40	0.32	0.68	1.5

Taxes increase when the level of income increases: thus a budget deficit, (surplus) will be eliminated when income increases (decreases). The influence of the Keynesian multiplier becomes weaker when NNP grows, so that possible distortions have less powerful repercussions throughout the economy.

Conclusion: a progressive tax system is a powerful instrument for stabilization, because budget discrepancies will be eliminated rather quickly while the stability of the economic system improves owing to a decrease in the size of the multiplier.

FISCAL POLICY AND TAXATION

[Problem 12]

Government can apply various measures to fight inflation; 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

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

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

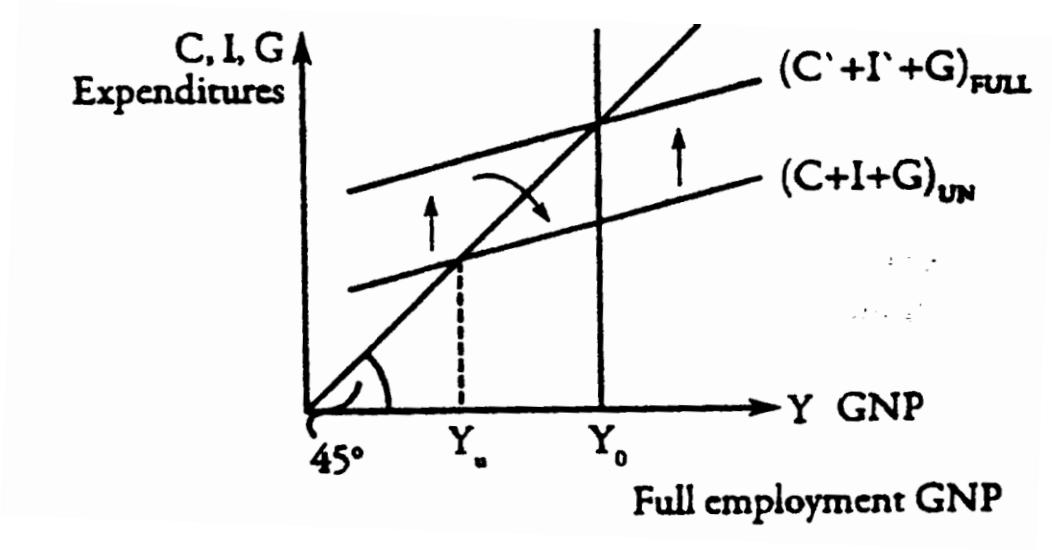
The effect of a proportional tax structure on inflation is much less than that of a progressive tax structure, because the percentage taken from rising income remains the same. Still, because the total tax revenue increases, the budget deficit slowly closes when income rise, assuming that the government expenditures 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 consumers 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 tax 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.

[Problem 13]

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

Solutions: When the government levies personal income taxes T_P the disposable personal income Y — T_P is decreased and thereby personal on 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 investments, are affected. Property taxes affect the wealth owned by individuals and businesses and will thereby again affect consumption and investment. By changing the tax rates and/or the structure of the tax system (e.g,. proportional versus lump-sum taxes) the government, i.e,. federal. state and local authorities can influence the aggregate demand, particularly the consumption expenditures C and the planned investments I.



In figure I it can be seen that if the 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_0 —Y_U is the deflationary unemployment gap in GNP.

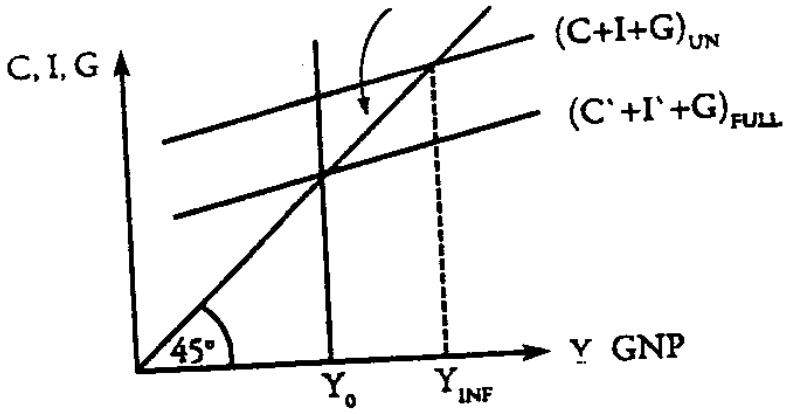


Fig. 2

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_0 . and only nominal income Y = P.$\bar{Y}$ can be increased by raising general price level P. (see figure 2). $Y_{linf} - Y_0$ 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: $C = G(Y .T .A)$

For simplicity, assume the following linear functional form

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

where

C = consumption expenditures

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

c_2 = marginal propensity to consume out of wealth owned, say

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 earnings before income taxes R.

$$I = I(r .T .R)$$

For simplicity, assume the following linear functional form

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

where

I = Planned investments

r = interest rate (= Opportunity cost of capital)

t_3 = corporation income tax rate

α = reaction coefficient of investments to the earning after rate.

β = reaction coefficient of investments to the earnings after taxes.

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

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

Substituting equations (I) and (2) into equation (3) yields:

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

Brining all the terms with Y to the left hand side gives

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

Dividing both sides by the coefficient between square brackets [1–c_1(1–t_1)] give

$$Y = \frac{1}{1 - c_1(1 - t_1)}\{c_2(1 - t_2)A + \boldsymbol{a}\mathrm{r} + \boldsymbol{\beta}(1 - t_3)\mathrm{R} + \bar{G}\}$$

At this point something remarkable may be observed. The personal income tax rate t_1 affects the Keynesian multiplier $\frac{1}{1-c_1(1-t_1)}$ 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 $\frac{1}{1-c_1(1-t_1)}$ 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 $\frac{1}{1-0.8(1-0.25)} = 2.5$ to $\frac{1}{1-0.8(1-0.26)} = 2.45$. so if the autonomous expenditures were \$400 billion. GNP would be reduced from $2.5 \times 400 = \$1.000$ 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 in wealth is multiplied to a 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 amounts to $\$10.000$ billion, a property tax rise of 1 percentage point form $t_2 = 0.40$ to $t_2 = 0.41$ changes the income wealth multiplier from 0.15 to $\frac{0.1(1-0.4)}{0.4} = 0.1475$. and GNP drops by

$(0.15 \times 10.000) - (0.1475 \times 10.000) = \$25$ 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 14]

A government is encountering a deflationary gap of $\$250$ billion in the economy. It would like to reach a full employment level of income and can do this by either increasing expenditures only, or by increasing expenditures and taxes.

a) Supposing that MPC = 0.8 discuss the alternative policies.

b) How do these policies change if government is required to balance its budget?

c) Is there another alternative policy besides the two mentioned?

Solutions: By increasing expenditures alone the government avoids raising taxes. but will not be able to keep a balanced budget. To see by how much government expenditures must increase to eliminate the deflationary gap and reach full employment use the multiplier formula.

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

Where ΔY = deflationary gap = $\$250$

ΔG = change in govemment expenditures

and the factor $\frac{1}{1-C}$ = the Keynesian multiplier; c = 0.8

The amount of the deflationary gap to be counteracted is

$$\Delta Y = 250$$

Thus $\Delta Y = 250 = \frac{1}{1-0.8}.\ \Delta G = \frac{1}{0.2}\ \Delta G$

$$250 = 5.\Delta G$$

Government expenditures must increase by $\Delta G = \frac{250}{5} = 50$ billion dollars, to reach full employment of income. There are two types of income tax systems: the proportional tax, and the lump-sum tax. The proportional tax takes a certain percentage t from income Y. so that the disposable income left is

$$Y_{disp} = Y - {}_tY - (1 - t)Y \qquad (1)$$

Households consume out of disposable income

$$C - c_{.}Y_{disp} + \bar{C} \qquad (2)$$

Substituting (1) into (2) yields

$$C = c\,(1 - t)Y + \bar{C} \qquad (3)$$

Total aggregate demand is equal to the sum of consumption, investment and government expenditures.

$$Y = C + In + G \qquad (4)$$

Substituting (1) into equation (4) results in.

$$Y = c(1 - t)Y + \bar{C} + In + G \qquad (5)$$

Brining all terms, including Y. to the left side:

$$[1 - c\,(1 - t)]Y = \bar{C} + In + G \qquad (6)$$

Divide both sides by the term [1–c (1 – t)]:

$$Y = \frac{1}{1 - c(1 - t)}\,(\ \bar{C} + In + G\ ) \qquad (7)$$

Notice that the multiplier has become more complicated; it is in effect reduced in value. This can be explained by recalling that taxes form a leakage in the income–expenditure flow.

Changes in autonomous consumption or investment arc not the focus of interest here. so $\Delta\bar{C}$ = ΔIn = 0 and there remains:

$$\Delta Y = \frac{1}{1-c(1-t)}\Delta G \qquad (8)$$

What tax rate should be set, and how much should the government spend to beat the deflationary gap? There are two variables, ΔG and t. and only one equation, so the only thing that can be determined is a relationship between ΔG and t that has to be fulfilled if the deflationary gap is to be completely defeated.

From equation (8) there was obtained:

$$[1-c(1-t)]\,\Delta Y = \Delta G \qquad (9)$$

$$[1-0.8(1-t)]\,250 = \Delta G$$

$$[0.2 + 0.8t]250 = \Delta G$$

$$250+200t = \Delta G$$

This is the relationship sough after. For example, if t = 0.30. then

$$\Delta G = 50 + 200(0.30)=100.$$

and if the tax rate is 20% then

$$\Delta G = 50 + 200(0.20) = 90$$

The lower the tax rate. the less leakage in the income–expenditure flow that occurs, the more effective government expenditures are, and the less government has to spend to beat the deflationary gap. An interesting question arises when the government is required to balance its budget.

Assuming that the budget is balanced in the beginning, this means that the total increase in government expenditures must equal the total increase in taxes.

$$\Delta G = t\Delta Y$$

Substituting this in equation (9) gives

$$[1-c+ct]\ \Delta Y = t\Delta Y$$

Or $$(1-c)\ \Delta Y + ct\Delta Y = t\Delta Y$$

Bring the second term to the hand side:

$$(1-c)\ \Delta Y = (t-ct)\Delta Y$$

$$= t(1-c)\Delta Y$$

This can only be true if $t = 1.00$. In other words, in the case of a balanced budget, total government expenditure equals the deflationary gap.

$$\Delta G = \Delta Y = 250.$$

and the increase in the households' disposable income equals zero. From equation (1) taking changes at both sides.

$$\Delta Y_{disp} = (1-t)\Delta Y$$

$$(1-1)\Delta Y = 0$$

The lump-sum tax is a deduction over the board T from income Y. so that the disposable income left is

$$Y_{disp} = Y - T \qquad (10)$$

Households consume out of disposable income.

Substituting $(l0)$ into equation (2) yields

$$C = c(Y - T) + \bar{C}$$

Substituting this into equation (4) results in

$$Y = c(Y - T) + \bar{C} + In + G$$

Bring all terms including Y to the left side:

$$Y - cY = (1 - c)Y = \bar{C} + In + G - cT$$

Divide both sides by the term I - c :

$$Y = \frac{1}{1-c}\ (\bar{C} + In + G - cT)$$

Notice that in this case the simple multiplier has not changed. But total expenditure are deceased by cT. i.e.. that part of income that would have gone into consumption had it not been taxed away. Again–there is a leakage, but it is final. Again $\Delta C = \Delta In = 0$.

So $$\Delta Y = \frac{1}{1-c} \quad (\Delta G - c\Delta T) \qquad (11)$$

The increase in the lump–sum tax only reduces the total expenditures. reducing the effect of the increase in government expenditures ΔG.

Substituting the values for ΔY and c into equation (11) yields

$$250 = \frac{1}{1-0.8}(\Delta G - 0.8T)$$

Or $$50 = \Delta G - 0.8T$$

i.e.. the required relationship between the increase in government expenditures ΔG and the increase in the lump–sum tax.

For example, if T 50. then

$$\Delta G = 50 + 0.8(50) = 90$$

and if T = 100. then

$$\Delta G = 50 + 0.8(100) = 130$$

In order to beat the deflationary gap.

What happens if the government is again required to balance its budget? In the case of a lump–sum tax this means

$$\Delta G = \Delta T$$

Substituting this in equation (11) results in

$$\Delta Y = \frac{1}{1-c} \quad (\Delta G - c\Delta G \ )$$

$$= \frac{1-c}{1-c} \cdot \Delta G$$

so $\Delta Y = \Delta G$

Again it is concluded that the balanced budget requirement implies that the increase in the government expenditures equals the deflationary gap $\Delta G - \Delta Y - 250$ billion dollars. The increase in the lump–sum tax would equal this, and disposable income would be reduced once and for all by the same S250 billion.

The other alternative would be not to change government expenditures. $\Delta G = 0$. but to decrease taxes.

In the case of the proportional tax rate use equation (9), substituting $\Delta G = 0$.

Then $[1- c(1–t)] \Delta Y = 0$

or $[1-0.8(1-t)]250 = 0$

or $[0.2 + 0.8t]250 = 0$

or $50 + 200t = 0$

$200t = -50$

$$t = \frac{50}{200} = -0.25$$

Thus the tax rate should be reduced by 25% to beat the deflationary gap.

In case of the lump-sum tax use equation (11), substituting $\Delta G = 0$.

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

$$250 = \frac{-0.8}{0.2}\Delta T$$

$$= -4\Delta T$$

$$\Delta T = -62.5$$

Thus there should be a final reduction of $\$625$ billion in the lump-sum tax in order to beat the deflationary gap.

STABILIZING AND DESTABILIZING FACTORS

[Problem 15]

List some automatic stabilizers in the economy and explain their working.

Solutions: There are some structural, behavioral, and institutional relationships in the economy that have a stabilizing effect on it, besides the concrete stabilizing policy measures.

For example, if planned investments fall (because of worsening prospects) and planned savings remain on the previous level, that is I < S. the economy glides into a recession. However, much of the saving is business saving from the depreciation reserves and retained earnings (= undistributed profits) of corporations. To some extent investment and business saving are linked. Business saving will also fall if investment falls, though not to the same extent. Thus the investment-saving gap is smaller. Secondly, the permanent income effect works as a stabilizer. As incomes start to fall, households tend to adhere to the previous, higher consumption levels, because they expect the fall in income to be only transitory. Declining income and high consumption means rapidly falling savings. This also helps to keep the investment-saving gap small.

For a while, too, the downward pressure of accelerator effects is comparatively small. Investment plans are made in advance, and will probably be carried out if businesses believe that the recession is only carried out if businesses believe that the recession is only temporary. This keeps the investment level high.

But the concrete policy measures act as stronger stabilizers. The rate of tax of the progressive income tax is lower on low incomes than on high incomes. Therefore, a fall of 7% in pre-tax incomes, for example, will result in a decline in disposable income that is smaller than 7%.

Since consumption plans are based on disposable income, the downward influence from falling consumption will be lessened by the progressiveness of the income tax. For example, suppose person one is in a low income-tax bracket with a tax rate of $t_l = 10\%$, and person two is in a high-income tax bracket with a tax rate of $t_2 = 40\%$. Assume further that both persons have the same marginal propensity to consume of 0.8. and there is no autonomous consumption. Then the respective consumption can be described by:

$$C_1 = C(1-t_l)Y_1 = 0.8 \times 0.9 \times Y = 0.22Y_1$$

$$C_2 = (1-t_2)Y_2 = 0.8 \times 0.6 \times Y = 0.48Y_2$$

If the economy consisted of Person One. the multiplier would be

$$K_1 = \frac{1}{1-0.72} = 3.75;$$

If the economy consisted of Person Two the multiplier would be

$$K_2 = \frac{1}{1-0.48} = 1.92$$

It is clear that the higher the tax rate, the lower the multiplier, and the less destabilizing the multiplier will be. When a fall in total consumption is distributed fifty–fifty over the income brackets, the multiplier is the weighted average of the two above.

$$K_3 = 0.5 \times 3.57 + 0.5 \times 1.92 = 1.785 + 0.96 = 2.745$$

A second policy stabilizer built into the system is the automatic growth of government transfer payments as the economy declines. As incomes move downward and unemployment increases, both unemployment benefits and welfare payments will increase. This slows the in personal incomes and thus the decline in planned consumption expenditure.

The basic weakness of all these stabilizers is their lack of predictive ability. These stabilizers rely on restorative influence which

appear only when an actual deviation occurs. and they often react too late.

[Problem 16]

List 4 destabilizing processes in the economy and explain why they are destabilizing

Solutions: It appears that the multiplier process, the accelerator process, the effects of expectations, and the inflationary process exert destabilizing influences on the on the economy.

The multiplier exerts such influences because an initial, relatively small decline or increase in expenditure somewhere in the economy will decrease or increase other incomes and thus other expenditures. The consequence is a multiplied effect of a relatively small initial impulse or disturbance; i.e.. the 'noise', or disturbance, in the economy is amplified.

The accelerator effect works along the same lines: a fall in output will cause a decline investment, lowering expenditure. Thus, via the multiplier, output falls further. There is an equivalent upward push on output if output increases.

The expectation of recessions or booms in the near future will tend to lower or raise investment plans. and thus help to cause the expectations to come true. This is an example of 'self-fulfilling prophecies'.

The 'built-in' inflationary process will sustain inflation even though its initiating causes have been removed. The inflation is built into the expectations, the inflation-causes causes of contracts, the financial transactions. etc.

QUBTIONS FOR REVIEW

Choose the correct answer:

1. Built-in stabilizers: (a) are sufficient to maintain full stability (b) reduce the size of the multiplier resulting from, say, an increase in investment spending (c) are found primarily in the fiscal policy of grass-roots government (d) tend to lessen fluctuations in GNP through their effect om disposable income, but do not in themselves change the size of the multiplier (e) were endorsed by Adam Smith.'

2. Our large public debt is undesirable because: (a) there is a definite danger that the Federal government may go bankrupt (b) when the entire debt falls due, it must be paid out of higher taxes (c) it has increased at a faster rate than has the GNP (d) the Treasury as a creditor, may strongly endorse policies which conflict with a tight money policy (e) non of the above

3. A countercyclical fiscal policy would include (a) raising government expenditures and cutting taxes in times of depression (b) raising government expenditures and cutting taxes in times of boom (c) (d) cutting government expenditures and cutting taxes in times of depression (e) none of the above.

4. In determining the government's fiscal posture, one should look at: (a) the actual surplus or deficit (b) the full-employment budget surplus or deficit (c) the personal income tax (d) the inflationary impact which the automatic stabilizers have in full employment economy.

5."Automatic stabilizers" tend to: (a) adjust tax rates to keep the full employment budget in balance (b) adjust pay to cost-of-living changes (c) adjust tax rates to keep the actual budget in balance (d) reduce national income fluctuations (e) keep the money supply at a steady 4 to 6 percent increase per annum.

6. Economists are in general agreement that discretionary fiscal policy will stabilize the economy most when: (a) the budget is balanced each year (b) budget deficits are continuously increased (e) deficits are increased during recessions and surpluses during inflations (d) deficits are incurred during inflations and surpluses during recessions (e) budget surpluses are continuously increased.

7. The government can worsen an inflationary situation when it: (a) increases taxes (b) increases debt-financed spending (c) exercises money and credit policies to reduce private spending (d) makes its public activities more efficient (e) does nay of the above.

8. An expansionary fiscal policy requires: (a) increased government spending, higher taxes or both (b) lowered government spending, lower taxes (c) increased money supply and increased interest rates (d) increased government spending, lower taxes, or both.

9. In an inflationary period, an appropriate policy for the Federal Reserve would be to: (a) encourage member banks to increase their loans (b) sell government securities on the open market (c) lower legal Reserve requirements (d) decrease the discount rate (e) reduce margin requirements.

10. A large public debt may: (a) impair incentives to innovate the invest (b) decrease inflationary pressures in a full-employment economy (c) shih the consumption schedule down (d) create a larger stock of private capital for future generations.

11. The ultimate rule of fiscal discipline in modern mixed economies is to: (a) permit the automatic to balance the budget (b) balance the budget every four years (c) balance the budget over the cycle (d) balance the budget every year (e) do none of the above. since there are no rules.

12. The effect of a government surplus upon the equilibrium level of NNP of substantially the same as: (a) decrease in saving (b) an increase in investment (c) an increase in consumption (d) an increase in saving.

13. "Old-fashioned public finance" refers best to which of the following views? (a) the "fill-employment budget" should, in peacetime, be balanced (b) An example of a good tax for revenue purposes is a head tax. since its tax revenue is stable over the business cycle. (c) The public debt is less of a burden in peace than in war because only under wartime conditions is it necessary to write a blank check to finance national survival (d) The government budget should be balanced over the cycle rather than every year.

14. Imagine an economy at full employment. If receipts fall short of expenditures, it can be concluded that: (a) investments exceed savings (b) savings exceed investments (c) the tax structure has been adjusted upwards (d) an equality of tax receipts and expenditures.

15. Which of the following is not a public good? (a) city hall (b) fire station (c) TV set (d) national defense program.

16. A major purpose of the Federal Trade Commission is to: (a) increase trade between businesses (b) curb inflation (c) take action against fraudulent and misleading advertising (d) increase employemement.

17. The very nature of social goods and services makes it: (a) easier to measure precisely the manner in which benefits are apportioned among individuals or institutions (b) easier to understand how the tax burden in allocated among taxpayers (c) difficult to measure apportioned among individuals or institutions (d) useful in redistributing income.

18. Sales and excise taxes are considered "Hidden taxes" in that they are shifted by sellers to consumer via (a) increased sales (b) higher substitute-product prices (c) lower product prices (d) higher product prices.

19. The rationale behind the ability-to-pay taxation is that (a) households and businesses should purchase goods and services of government in the same manner in which ocher commodities are bought (b) larger income receivers should pay more than proportionate amount (c) consumers act rationally. therefore, need tax breaks (d) smaller income receivers should pay less than proportionate amount (e) the first dollars of income received in any period of time will be spend upon basic high-urgency goods.

20. A disadvantage of public works as a medium of positive fiscal policy is that: (a) the taxes needed to pay for the projects might result in lower spending (b) most public works programs yield little or no benefit to the (c) the increase in spending is particularly likely to lead to inflationary price rises (d) it necessarily means diverting resources into public works when they are more needed elsewhere (e) once under way, it is difficult or expensive to stop many public works programs.

Fill in the blanks:

1. _____ means the budget surplus that would develop. given the existing tax rates and spending structure. if the economy were to be at its full-employment level.

2. _____ refers to the fact that with given tax rates and expenditure policies. a rise in national income will tend to produce a surplus while a decline will tend to result in a deficit.

3. The Federal debt may best be viewed by an economist as a burden primarily to the degree that it reduces the growth and level of the _____.

4. A _____ tax is generally desirable from the standpoint of fiscal policy because the changes in total collections will vary proportionately more than the changes in GNP.

5. The effectiveness of the built-in or automatic stabilizers is limited by the fact that the offset which the stabilizers provide to a change in private spending is less than the change in _____.

6. Fiscal policy is a course of government action to stabilize the level of national output chiefly through the use of the government's taxing and spending powers toward controlling the total volume of _____ in the economy.

7. The basic consideration which underlies the balanced budget multiplier is that individuals and businesses reduce their expenditures by some amount less than any increase in their _____.

8. A _____ stabilizer reduces the size of the multiplier resulting from, say, an increase in investment spending.

9. The notion that the basic purpose of the Federal budget is to stabilize the economy regardless of resulting increases in the size of the public debt describes _____ finance.

10. By the idea of _____. we mean the idea that the government should always collect current taxes sufficient to cover its current peacetime expenditures.

11. The partial freezing on federal construction expenditures during the 1969 Vietnam inflation is an example of _____ fiscal policy

12. Generally speaking, public works expenditures tend to be more _____ than transfer payments.

13. An argument against a large public debt is that the transfer payments which are involved in meeting intersect charges may impair _____.

14. _____ principle suggests that increases in government spending will increase that interest rate and thereby reduce investment

15. If government adhered strictly to a (n) _____ budget, then the government's budget would tend to destabilize the economy

Determine whether the following statements arc true or false;

1. Automatic stabilizers can never filly offset the instabilities of an economy.
2. a system of unemployment insurance is automatically stabilizing in its effects upon GNP.
3. An "inflationary pp" can be eliminated by increasing government purchases and reducing taxes.
4. Consumers fulfill a built-in stabilizing function if they quickly adjust their standards to changes in their incomes.
5. There is strong evidence to support the theory that increased government spending reduces private investment on balance.
6. The lower the levels of government spending and taxation at which a deficit of a given size occurs, the greater will be its concretionary impact upon the economy.
7. The equilibrium level of NNP will not change in response to changes in the investment schedule.
8. It is possible for the fill-employment budget to be in surplus while the actual budget is in deficit.
9. During a period of prolonged inflation. compensatory fiscal policy might contribute to the overproduction of private goods relative to social goods.
10. Positive fiscal policy means nothing mow than increasing government expenditures in depressions and reducing it in prosperity.

11. To achieve an annually balanced budget during a recession, the government must decrease the tax rates.
12. Corporations fulfill a built-in stabilizing function if they pay the same annual dividend no matter what their earnings.
13. A disadvantage of using public works as a weapon of fiscal policy is that tax collections would have to be raised in depressions in order to finance the expenditure.
14. The MPS indicates what fraction of a drop in DI will result at the expense of consumption.
15. Automatic stabilizers can never fully offset the instabilities of an economy.

Chapter Five

INFLATION AND UNEMPLOYMENT

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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:

(l) The GNP Deflator discussed in Chapter 4).

(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:

$$1947: \frac{\$3.03100}{22.3}\,100 = \$13.591.00$$

$$1987: \frac{\$3.853.00}{113.6}\,100 = \$27.1591.00$$

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.

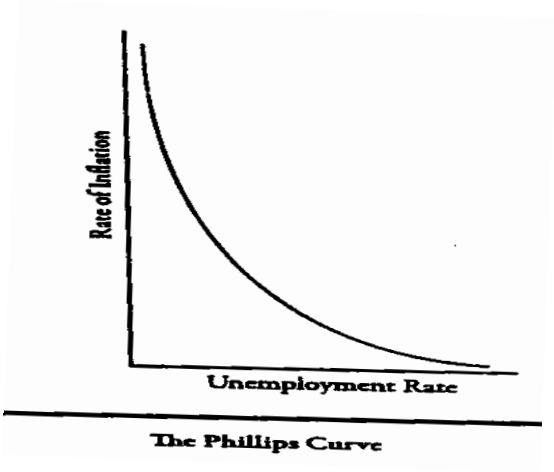
Cyclical unemployment is unemployment resulting from too few jobs. Its seriousness is not doubted by anyone.

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

$$\text{real GNP} = \frac{\text{nominal GNP}}{\text{P}}$$

[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

$$Y_{\text{potential}} = \frac{Y_{demand}\uparrow}{P\uparrow} = \text{constant}$$

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)**.

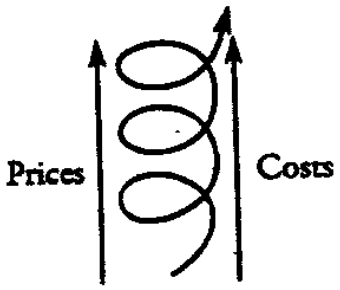


Fig. 1

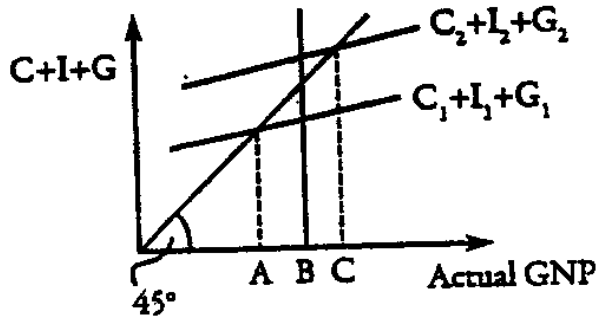


Fig. 2

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 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 ÷ 30) years .An 8 percent annual rate of inflation will double the price level in about 9 (= 70 ÷ 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:

$$(1 - 0.12)(1 - 0.12)(\text{l} - 0.12)(\text{l} - 0.12) \times 1.000$$

$$= (1 — 0.12)^{\text{"}} \times 1.000 = 0.59969 \times 1.000 = \$599.69$$

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:

$$\text{Nominal GNP} = P_1Q_1 + P_1Q_2 + P_3Q_3 + \ldots\ldots + P_nQ_n$$

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

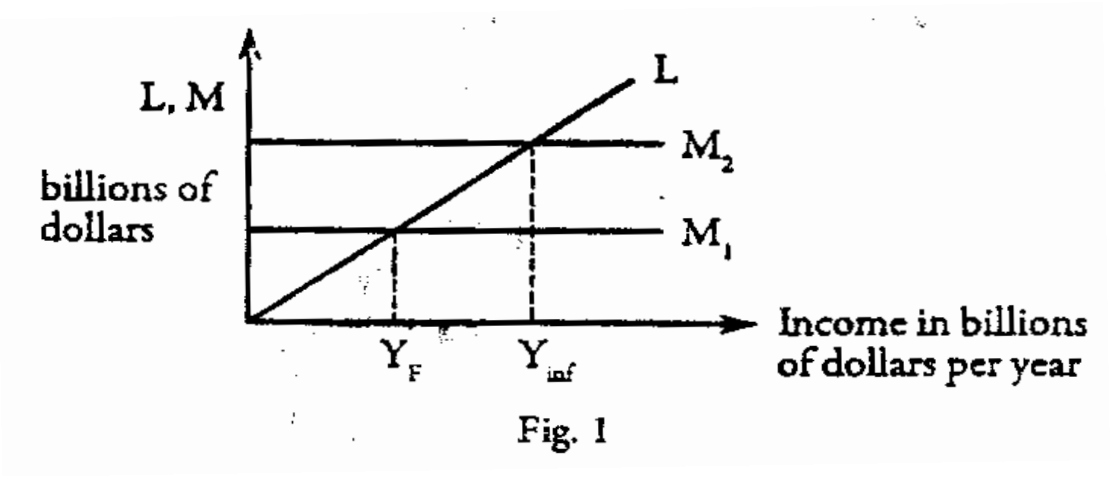


Fig. 1

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)**.

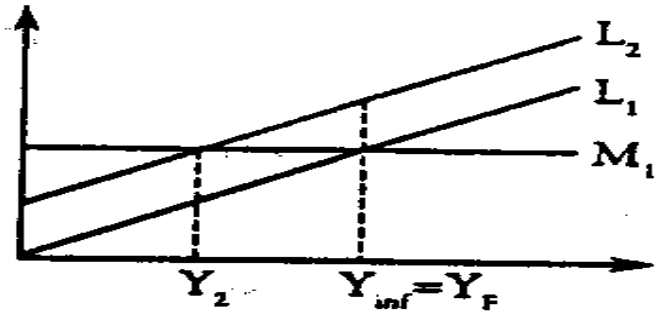


Fig. 2

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:

(I) 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]

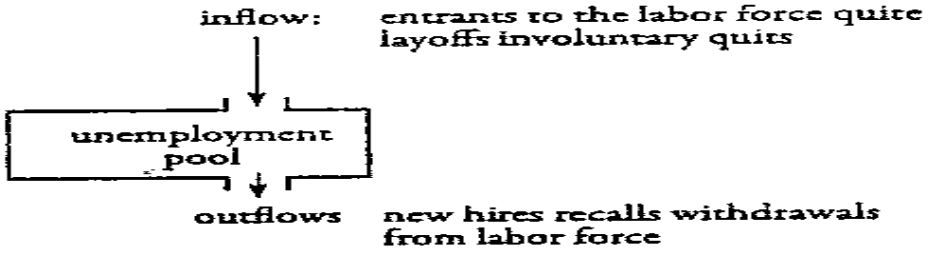
What are the differences frictional, seasonal, and technological unemployment?

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?

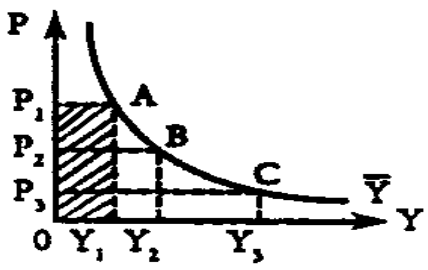


Fig. 1

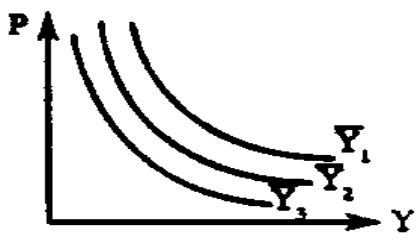


Fig. 2

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 $Y = P \times y$. 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

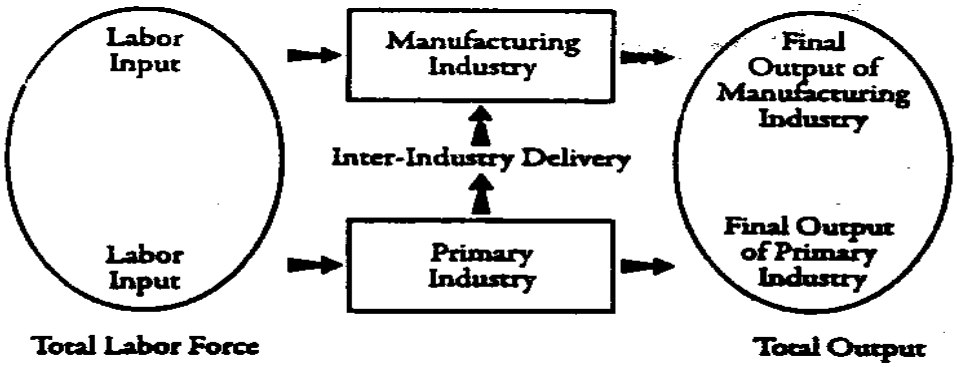
$$\Delta Y_m \times \frac{L_m}{Y_m} = 50\text{billion} \times \frac{300.000}{5\ billlion} = 3\ billion\ workers$$

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]

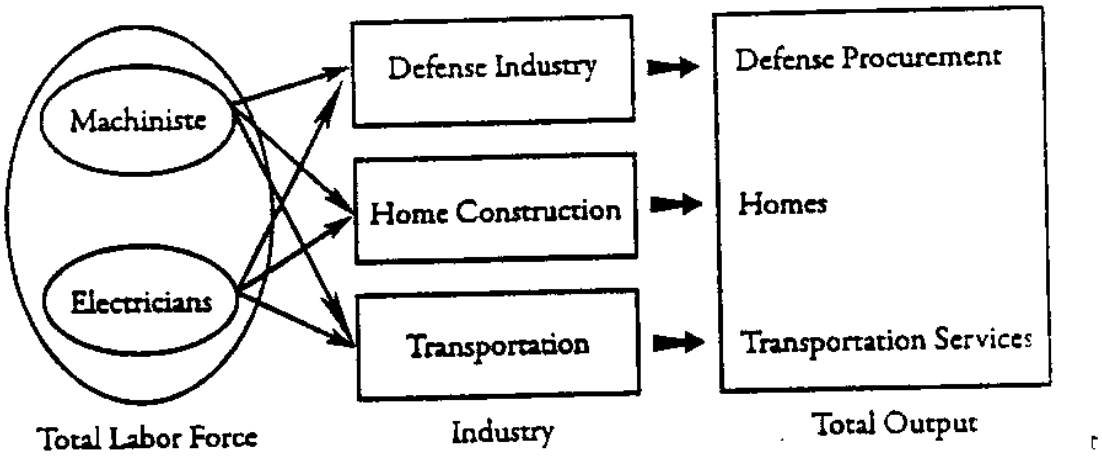
Suppose there are three industrial sectors in the economy, defense production, home construction and transportation, and only two categories of worker, machinists and electricians. Assume that it takes a long time and much investment in retraining programs before one category of workers can do the work 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.

$$\Delta Y^{T} = 12.22 \text{ billion dollars.}$$

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?

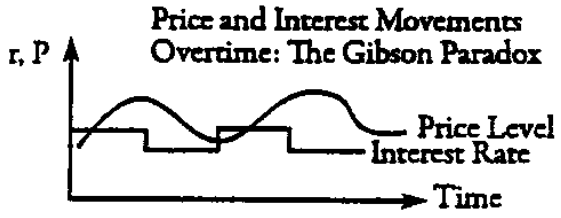


Fig. 1

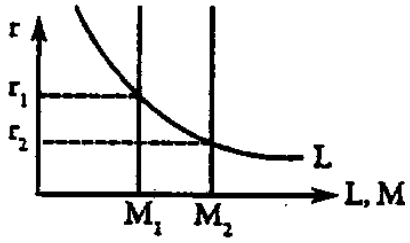


Fig. 2

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

$$\$1.000 \times 5\% = \$50$$

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?

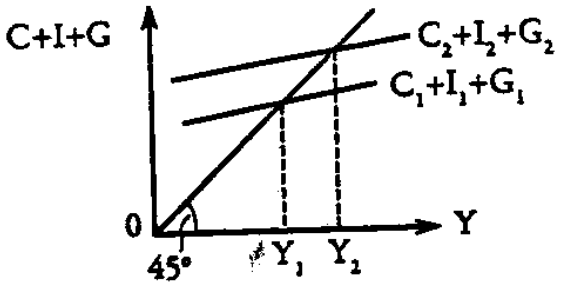


Fig. 1

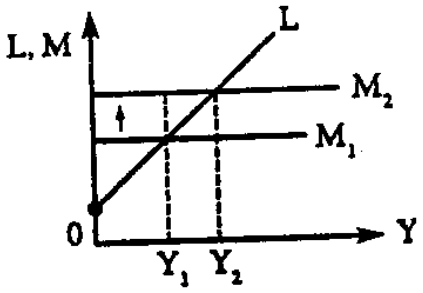


Fig. 2

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.

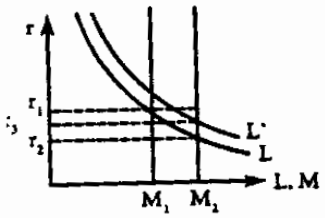


Fig. 3

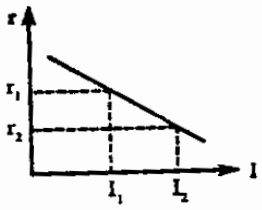


Fig. 4

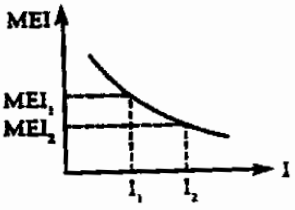


Fig. 5

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

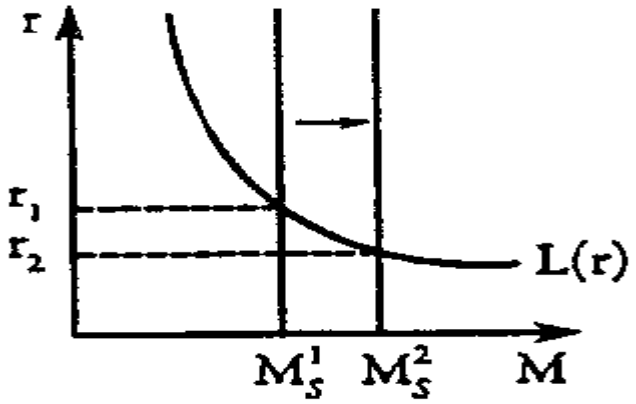
$$\text{MEI} \frac{\boldsymbol{expected\ annual\ net\ return}}{\boldsymbol{cost\ of\ investment\ (machine.building.ect}}$$

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

$(1.8M)(V) = (P')\ (2Q)$

$1.8MV = 2P \cdot Q$

$P' = 0.9\ \frac{MV}{Q}$. but $\frac{MV}{Q} = P$

thus $P' = 0.9P$

$$\Delta P = P' - P = 0.9\,P - P = -0.10P$$

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 = $\bar{\imath}$ and Y =$\bar{Y}$: but then there is also the real money demand constant.

$$L(\bar{\imath}.\bar{Y}) = \bar{L}$$

Also, in order to maintain the equality between the supply and demand for money, changes in the nominal money supply, ΔM /M, must equal

changes in the price level $\Delta P/P$; so m $=\pi$, 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 Δ 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 $\dot{\pi}$ because it influences labor and material costs.

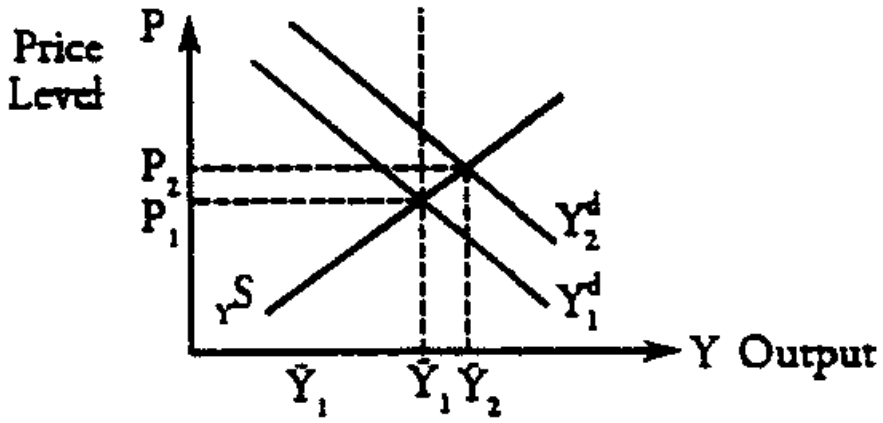


Fig. 1

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?

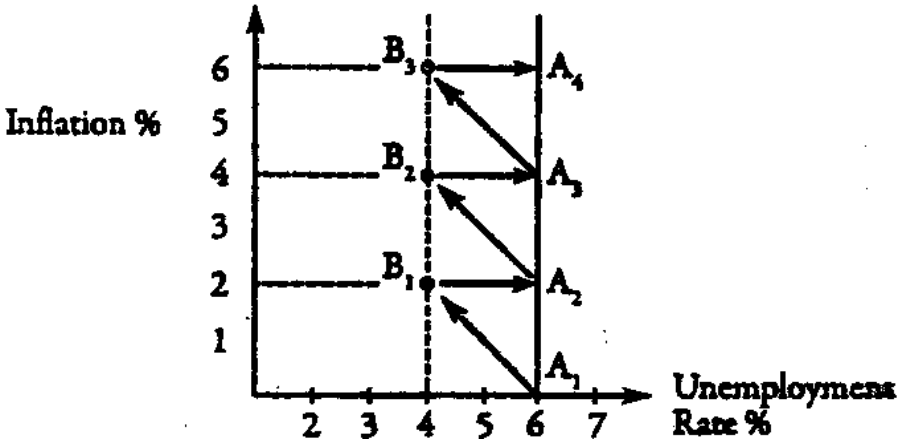
Solutions :Monetarists believe that changes in the growth rate of the quantity of money are responsible for changes in the level of economic activity. The supply of money effects interest rates, which in turn affects investment .So, the key to stabilizing economic fluctuations is stabilizing the growth 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'.

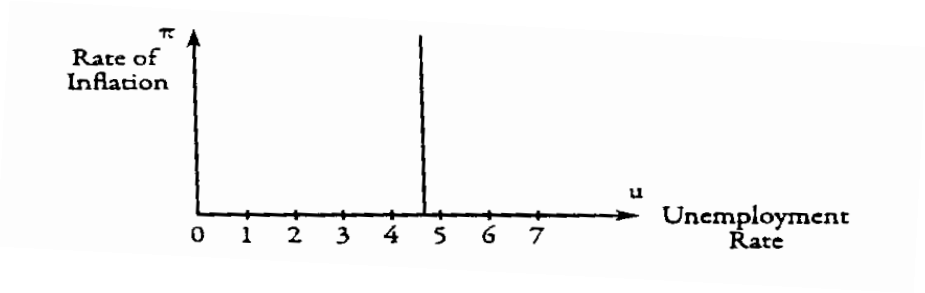
The process may now be repeated. A frustrated government will try again to expand the economy. Aggregate demand increases, prices rise, money wages remain temporarily constant, profits increase, output

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.