Chapter - 2

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THEORETICAL ASPECTS OF PUBLIC DEBT ANALYSIS

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2.1 Introduction

The present chapter makes a brief review of the theories of Public Debt as well as role of fiscal policy and sources of revenue of the government.

2.2 Role of Fiscal Policy

Fiscal policy as budgetary policy plays very significant role in deciding various macro economic consequences. It is the policy of government in respect of its yearly programme, public expenditure and public debt programme.

Definitions of Fiscal Policy

"Fiscal Policy refers to all collective working of all budgetary instruments of government receipts and disbursements."

According to Arthur Smithies -

"Fiscal Policy is a policy under which the government uses its expenditure and revenue programme to produce desirable effects and to avoid undesirable effect on the National Income, Production and Employment."

Mrs. Ursula Hicks

"Fiscal Policy is concerned with the manner in which all the different element of public finance. While still primarily concerned with carrying out were own duties (as the first duty of a tax is to raise revenue) may collectively be geared to forward the aims of economic policy."

Various Views

Fiscal policy plays a vital role in the economic development of every nation. But the role that the fiscal policy has to play in economy is changed with course of time.

Classical View
Keynesian View
Modern View

Classical View

Classical philosophy is based upon following two principles.

1. Laisser Faire Policy
2. J. B. Say's Law of Market

According to Say – well known classical economics

"Every supply creates his own demand." Thus, there is no overproduction and unemployment. Classical believes that governments have to perform neutral role in economy. Governments have to perform some basic functions i. e. justice, maintenance of law and order, security etc. According to them governments intervention beyond the limit may disturb the smooth working of an economy. Thus, they give importance to sound finance which consists –

1. Government should spend the least and tax the little.
2. Taxation should have minimum adverse effect on production.
3. Public Expenditure should be on productive fields.
4. There must be a balanced budget.

Keynes's View on Fiscal Policy

Upto 1930s classical ideas are become very famous. But after 1930's tremendous change occurs in them i. e. Classical ideas are replaced by Keynesian ideas.

With the advent of world wide depression during 1930s total world caught up in two big problems – 1) Unemployment and 2) Over Production.

Over production as per to bring out the economy from such critical juncture Keynes gives importance to fiscal policy instead of monetary policy. According to him only government is able to bring out the economy from such juncture by using its budgetary instruments. Thus he gives importance to functional finance.

Modern View on Fiscal Policy

As modern government is welfare oriented, the first and foremost aim of modern government is to increase welfare of society, of people. Thus, government interventions become necessary Government through various taxes, public expenditure programmes, public debt, budget, tries to achieve balanced growth in an economy.

Thus, fiscal policy face to face, with monetary policy plays an important role in overall economic development.

Role that fiscal policy played in modern state/in developing/UPC's can betterly understand from following points.

Role of Fiscal Policy

1. Full Employment

The foremost aim of fiscal policy in developing economies is achieve the level of full employment. According to Prof. Lerner, The economic gains from full employment are enormous. Full employment yield individual security and security promotes growth.

Government through/by undertaking public works programme tries to increase employment levels, even by spending sufficiently on social and economic overhead, where the private investment shy, government tries to increase employment.

2. To Mobilise Resources or Optimum Allocation of Resources

In the underdeveloped or developing countries government have to perform so many functions, because of lack of sufficient private investment due to instability. Thus government plays duel role in such economies by undertaking functions and also financing them. And this is done through budgetary instrument.

Government by introducing various fiscal instrument, tax holidays, tax concessions, tax exemption tries to mobilise resources.

Sometimes by introducing heavy taxation government tries to divert resources from unproductive to productive good industries.

3. Equitable Distribution of Income and Wealth

Generally most of the UDC's or developing countries caught in the problem of poverty. Where the large section of society is poor and very few are very rich. This extreme inequality creates political and social discontentment which further generates economic instability and harm for the economic development.

In this situation fiscal policy plays an important role (to reduce inequality). Fiscal instrument like progressive taxation on rich, imposition of tax on luxury consumption goods, and on the other hand tax exemption for lower income group and public expenditure on social overheads, education, medical facilities, public health measure, subsidy of various types through this government tries to reduce the gap between rich and poor.

4. Price Stability

Inflation is the permanent phenomena in developing or UDC's. There is general tendency of 'price rise' in these countries due to continuous government expenditure.

Again price instability and economic instability are correlated to each other. A small increase in price adversely affects the economic development. Thus, in such a situation fiscal policy through its instruments plays a major role by granting concession, subsidies and protection in an economy.

5. To Encourage Saving and Investment

In the developing countries the propensity to consume is very high. Thus there is low saving and as saving is low, investment is also low. Again to depend upon foreign capital is also dangerous. Thus, the best way is accumulate the saving from domestic economy,.

Fiscal instruments like heavy taxation on (unnecessary) unproductive goods help government to raise the level of saving.

Again by introduction of tax holidays, lower rate of taxation, tax concession, tax rebate, tax exemption, may promote productive investment in all economy.

Thus, the fiscal instrument plays an insignificant role in encouraging saving and investment.

6. Economic Stability

Instability hinders growth in economy. Higher inflation and depression both causes instability. Fiscal instrument plays an important role to remove such instability.

During the depression period, when income, employment, production and prices declines, producers employ less factor of production and investors are apprehensive of future prospects of profit. All this happen only due to deficiency of effective demand. Under such situation, an anti-depression fiscal policy is pursued to revive economic activity. By introducing lower rate of taxation, concession, fiscal policy plays an important role in increasing effective demand.

Total inverse situation found during inflation period. Thus by introducing heavy taxation, new taxes, reducing transfer payments like pensions, unemployment allowance, and other social security benefits and on the other hand by reducing public expenditure, postponing repayment of public debt, fiscal policy tires to reduce instability.

7. Balanced Regional Development

This is an important phenomena in developing countries. Thus fiscal policy plays an important role in reducing this disparity. Through public expenditure programme government may develop backward areas industrially as well as agriculturally.

Again by introducing tax holidays. concessions, exemptions for the investment in backward areas fiscal policy tries to develop such area and reach balanced regional development.

2.3 Budget : Classification of Revenue and Expenditure

There was a time when governments activities were very few, thus the word 'Budget' cannot get much more popularity. But, today, modern Government is welfare government. The role and functions of government have expanded rapidly. Thus, the budget becomes the chief instrument of economic activity. So that –

"A budget is not only a financial statement of actual and anticipated revenues and outlays of the government but is also a document of detailed programmes and policies of action which they desire to pursue in the coming year for raising the level of economic activity."

Though the budget estimates for the coming fiscal years contain proposal of taxation, borrowing and public expenditure, the government in course of implementation of the budget programmes. Might face shortages of fund due to some important additions of activities and hence, might be in the necessity of fresh proposal of revenue receipts and expenditure which are made in what it called as "Supplementary Budget."

In some countries the budget has distinguish on the basis of financing. Budget programme which is financed by taxation is called as current budget and budget programmes financed by borrowing is called as capital budget.

Under the Article 112, it is compulsory for Government of India to present budget every year. In India, Budget is totally divided into two parts.

A) Revenue Account

B) Capital Account

Again both are subdivided into

A) Revenue Account : i) Revenue Receipts

ii) Revenue Expenditure

B) Capital Account i) Capital Receipts

ii) Capital Expenditure

i) Revenue Receipts

Revenue Receipts consisting of tax and non tax revenue.

1. **Tax Revenue**

Income Tax : Personal income tax is levied on individuals by Central Government and the proceeds are shared between Centre and State. This is totally based upon ability to pay principle.

Corporation Tax : This is the tax on the income of companies. Central Government levied corporation tax on the profit of big companies.

Interest Tax : Tax on the gross amount of interest accruing to the commercial banks on loans and advances made by them in India.

Expenditure Tax : Government of India introduce this but latter on withdrawn due to its failure. Again it was introduced during November 1987 under the Expenditure Tax Act 1987. This act provides for a levy of a tax on expenditure incurred in hotels.

2. **Taxes on Property and Capital Transaction**

Estate Duty : Estate duty was imposed on the estate of a person which was inherited by his heirs. But the tax yield was very low from such duty and on the other hand the administration cost is very high. Thus, V. P. Singh, the then Finance Minister abolished this from middle of March, 1985.

Gift Tax : Introduced on April 1958, and complement to the estate duty, wealth tax and expenditure tax. This tax is necessary to prevent evasion of other three taxes. Gift tax is charged every financial year on gift made during the previous year.

But unfortunately it was abolished during 1998-99 by Yashwant Sinha, the then Finance Minister due to its lower revenue collection.

Wealth Tax : A tax is imposed upon accumulated wealth or property of every individual.

3. **Taxes on Commodities and Services**

Central Excise Duties : Duty which is levied on the commodities which are domestically produced.

Custom Duties : Duties or tax imposed on the commodities imported to India or on those exported from India.

4. **Non Tax Revenue**

Interest Receipts

Dividend and Profit

Fiscal and Other Services

Fiscal services consists revenue received by the Central Government from -

Currency, coinage and mint

Other fiscal services relating to Indian security.

ii) Revenue Expenditure

Non developmental expenditure consist large part of total expenditure. This consists –

Interest Payment

Defence

Subsidies

General Services

Plan Expenditure

Social Services

Community Services

Maintenance of road and railways.

B) Capital Accounts

i) Capital Receipts

Capital Receipts consists of Internal Debt and External Debt.

1. Internal Debt

1.1 Market Borrowing

In this government borrows through sale of securities. Government securities are sold in the capital market. The Reserve Bank of India, Finance Ministry, Planning Commission together takes decision regarding how much the borrowing should be? Commercial bank, financial institutions are major investors in these securities.

1. Pattern of Securities

Short/Treasury Bills	:	360, 180, 90, 14, 7 days
Mid Term Securities	:	Time period 5 to 7 years
Long Term Securities	:	10 to 20 years

1.2 Small Savings : This is consisting of

Small Savings

Provident Fund

1.3 Term Loans from Financial Institutions

1.4 Borrowing from Reserve Bank of India

1.5 Reserve Fund and Deposits.

2. External Debt

Along with internally government also borrows externally. Composition of external borrowing is –

2.1 External Commercial Borrowing

Also known as private bank borrowing. This is short term borrowing consists 3 months period.

2.2 Donor Nation Debt

Generally given by developed countries to underdeveloped countries. This is all long term in nature. Totally depends upon the relation between these nations.

2.3 Borrowing from International Financial Institutions

Normally these are soft loans which are given at concessional rates by IMF, World Bank etc.

2.4 NRI Deposits

NRIs keep deposits in Indian bank. These deposit also a source of external borrowing.

ii) Capital Expenditure

This is expenditure on new project. This consist expenditure on public work, construction of power generation plant, construction of road and railways, flood control works, irrigation canals.

Defence Services : consists expenditure on army, navy and air force. This also includes expenditure on the construction of non-residential buildings, ordinance factories, machine tools and other equipments.

Social Services : Education, health, art, culture, family planning, sanitation, water supply, housing, urban development, social security, welfare activities and scientific development, all are part of social service.

Economic Services consists services like irrigation, animal husbandry, dairy, fishery development, industrial and mineral development, atomic energy, mining, metallurgical industries, water and power development, transport and communication and foreign trade.

General Services: expenditure on currency, coinage and mint, expenditure on fiscal services like contribution to international financial institution.

Loans and Advances to States and Union Territories: when there is shortage of fund at State and Union Territories level.

2.4 Theories of Public Debt

a) The Classical Theory

The economic doctrine that prevailed during the first two centuries of the development of modern nation, state i. e. 17th and 18th centuries was mercantilism who favoured 'Public Debt' as they gives importance to positive state intervention for the well being of home nation.

But the role that the state have to play in the economic development of nation, undergone an substantial change with the advent of classical philosophy under the Adam Smith. The whole classical philosophy is based upon the following 2 assumptions.

1. Laisser Faire Policy
2. Law of Market

In such an economy where 'every supply creates his own demand' (J. B. Say), where there is no overproduction and unemployment. Thus, economy is always at equilibrium, State have to play some limited functions i. e. Defence of economy, maintenance of law and order, provision of certain public works and public institutions. According to them, government/states intervention beyond this limit adversely affects the smooth working of an economy. They had more belief in individualism and felt that self interest always leads to national interest, hence the private sector activity advocated than public.[1]

Classical economists also against of taxes and public debt. They believe that, "taxes regarded as a sort of hail that destroys part of crop and every tax is evil in nature." Regarding the public debt they says that, as far as possible public borrowing should be avoided and if the government is compelled to borrow, government should finance its expenses entirely out of the taxes through public expenditure which is productive in nature, so that, debt would be liquidated ultimately and its whole process will be self liquidating.[2]

According to Adam Smith, father and founder of classical school, "Debt creation by state forced to increase rate of taxation for repayment. This higher tax rates affects to migration of capital." He felt that once the sovereign stated to borrow, his political power was increased because he was no longer dependent on tax exactions from his fellow beings. He aptly remarked, "The ability to engage in loan finance makes for irresponsibility in sovereign."[3]

Likewise Adam Smith, J. B. Say also criticise the public debt as it is wastefulness of money. By drawing an analogy between public and private borrowing he explains that, "Public borrowing is not only unproductive because the capital is consumed and lost, but in addition, the nation is burdened by the annual interest payment. But he favoured the loan finance as Adam Smith, which is necessary for the development of socio-economic overheads."[4]

David Hume opposed public debt saying "Nations once they began to borrow, would be able to resist until they reached the point of bankruptcy." Similarly, David Ricardo explains public debt as "One of the most terrible scourges which was ever invented to affect a nation..."[5] He was of the opinion that, interest which is paid on capital was not burden but it is simply a transfer from one person to another, but the principle of the debt exists no more.

In this context, Prof. Dalton said, "The burden of public debt is not something which an be thrown backward and forward through time and made to fall at will, wholly on one generation or wholly on another generation."[6]

J. S. Mill maintains that. "Government borrowing is harmful, because it destroys the capital which could otherwise be used for productive employment."[7]

However, subsequent thinkers like Malthus, Sedgwick, Colmes and others had some liberal views about the impact of public debt. J. R. Malthus, was of the view that, Public debt is not bad as supposed by others. In his words, "The material debt is not evil which it is generally supposed to be. Those who live on the interest from the national debt, like statesman, soldiers, and sailors contribute powerfully to distribution and demand.... the debt, once created is not a great evil."[8]

Prof. C. E. Bastable, another representative authority of classical public debt, refused the idea that burden of public debt cannot be shifted on the future generation. Distinguishing between loan and tax, he mentioned "A loan is voluntary and supplied by willingness, taxation is levied on the willingness and unwilling alike...."[9]

What was the relationship between 'Debt burden and future generation' classicals argues that through debt financing it is the present generation which suffers a loss of resources. The future generation will suffer if the present generation reduces its savings in order to meet the debt finance and leaves a smaller amount of capital resources for the future. This will reduce the productive capacity of the coming generation and they will accordingly lose."

The classical theory of public debt which is totally based upon unrealistic assumptions which was criticised on many grounds.

1. According to critics the Government expenditure is not always harmful and wasteful. Thus, public borrowing may not always creates any burden on economy.

2. Classical economists considers all public debt as a burdensome because it is contracted by withdrawing from the productively employed capital.

3. According to Adam Smith, servicing of public debt by tax revenue will drive capital out of country and induce individuals to migrate where they will exempted from such burden.

   But actually investment in foreign country depends more on its profitability and risks and hazards associated with it.

4. Servicing of internal public debt may not pose any problem and involve any burden, assumed by classicals. Because the rapidly growing national income bring about rise in current public revenue.

b) Modern Theory of Public Debt

Whole modern analysis of public debt is based upon the idea that, "Public debt does not shifts the burden on future generation because the same prosperity which pays the additional taxes will be benefited from the repayment of the debt."

The Economic Crisis of 'World wide Great Depression' of 1930's gave setback to classical theory of public debt and opened an new arena for the new one (modern) under the chairmanship of J. M. Keynes.

On the first page of the text of 'General theory of employment, interest and money' Keynes says, ".....the classical theory is misleading and disastrous, if we attempt to apply it to the facts of experience."[10]

As it is totally based upon unrealistic assumptions of Laisser Faire, full employment, unproductiveness of public expenditure, balance budget, self regulating economy.

Keynes vigorously criticise the self regulating theory and emphasised that economy could reach its equilibrium always at less than full employment.[11] And he gives importance to positive state intervention, as per to bring out the economy from the juncture of depression. He also favoured public debt; Keynes held the view that increase in public debt through multiplier effect would raise the national income. Keynes authorised government to borrow for all purposes so that effective demand in the economy may increase and thus employment and output may also increase. Thus he drew no demarcation between productive and unproductive expenditures as done by classicals. For Keynes borrowing for consumption will be as desirable as borrowing for investment in productive goods because consumption expenditure will induce investment to rise.

Likewise Keynes, his followers Lerner, Hansen, Harris, Moulton, challenged the version of classical economists and hold the view that public expenditure is never wasteful but it can be productive and essential means of increasing employment.

A. P. Lerner in his functional finance and federal development explains that, the absolute size of national debt does not matter at all, and it does not constitute any burden upon the society as whole.[12]

A. H. Hansen maintains that, "Now-a-days public debt is one of the very important means of increasing employment and has become an instrument of economic policy today."[13]

Prof. S. E. Harris rightly stated, "once the economists in a mere realistic mood, allowed unemployment, assumed elasticity in monetary supplies and agreed that government expenditure could be productive and need not necessarily be wasteful, the cost for public borrowing was strengthened."[14]

Harold G. Molten in his, "The New Philosophy of Public Debt" explains that, A huge public debt is a national asset rather than a liability and that continuous deficit spending is essential to the economic prosperity of the nation."[15]

Further A. P. Lerner says, 'An interpersonal or an international loan yields the borrower a real benefit. It enables him to consume and invest more than he is earning or producing. And when pays interest or repays loans he must tighten his belt, reducing his consumption or his investment. In the case of national debt we have neither the benefit nor the burden. The belt cannot be let out when borrowing and the belt, need not be tighten when repaying.[16]

According to Prof. Bhargava, "In case of borrowing there is lesser possibility of burden and taxation, because on account of borrowing (borrowed money invested to enhance the productive capacity) the capacity of society to bear the jerks of the taxation will be increased.

Thus, the advocates of no burden thesis, explains that internally held public debt involve no burden since we owe it to ourselves. On the other hand it gives certain advantages to us.[17] That large public debt encourages the growth of financial institutions like bank, stock markets, insurance companies. It also offers capitalists maximum safety for a part of their funds and encourages them to take risk with the remainder's and thus promotes the growth of new industries. It curtails consumption and promotes saving and thus helps to maintain the rate of formation and affects finally the standard of living.

The above no burden thesis is based upon following propositions.

1. The creation of public debt does not involve any transfer of the primary real burden to future generation.
2. The analogy between individual or private debt and public debt is fallacious in all essential respects.
3. There is a sharp and important distinction between the internal and external public debt.

c) Capital Stock Transfer Theory

The 'Capital Stock Transfer Theory' is advocated by David Ricardo and A. C. Pigou.[18] According to them, whether tax finance or loan finance will shift the burden on future generation will depend upon the extent of real capital inherited by it, consequent on the construction of public investment project.[19] This is because welfare of future generation depends on the sacrifice of present consumption without which capital cannot be formed to build up larger productive base. The curtailment of current consumption, however, depends on the relation of present generation to the withdrawal of real resources from the private economy for the purpose of public investment project.

Now, if the project is financed by taxation the tax payers are more likely to curtail consumption because their disposable income is reduced. In such a case, it is important to note, investment is less likely to be curtailed. On the other hand, if the project is financed by borrowed funds i. e. through sale of government bonds, the bond holders are more likely to curtail investment than consumption. This is firstly, because bonds can be easily monetised by selling them at any time in the money market and hence they are as good as money. Due to this liquidity aspect, bond holders do not felt that lending has much reduced their disposable income. Secondly, they will not only get back the principal, but also receive the agreed amount of interest income. This is the another reason why bond holders may feel richer. Thirdly, even though loan finance carries with it the obligation of future generation to pay interest and repay the debt, no one pay in future. Since distant things appear smaller, the bond holder is unable to assess his future obligation relating through the public debt though he is conscious about the estimated earnings from the debt. As a result of all this, the bond holders thinks that they are now richer and hence, are not likely to curtail consumption while purchasing government bonds which are more generally paid for with funds which would have otherwise been spent on investment.

As compared to tax finance, therefore it is the loan finance that would curtail consumption less. Since curtailment of current consumption will be less, the transfer of real capital stock of future generation will also be less. This will mean reduced future welfare finance, loan finance shifts burden to the future generation, while tax finance does not do so.

d) Buchanan's Thesis

No burden thesis, which became renowned and unchallenged during 30s and 40s century, by the great efforts of Keynes and his followers, Lerner, Hansen, Pigou, that – "Primary real burden of public debt cannot be shifted to future generation challenged by many economists after 1958, with the publication of Buchanan's treatise.

Buchanan in his, "Public Principal of Public Debt" criticise the "No Burden Thesis" and tries to disapprove the unrealistic proposition made by modern theory. He establish that –

1. The primary real burden of public debt shifted to future generation.
2. The analogy between pubic debt and private debt is fundamentally correct.
3. The external debt and internal debt are fundamentally equivalent.[20]

Buchanan develops his own burden thesis wholly based upon his own definition of 'Future generation'. He defines future generation as any set of individuals living in any time period following that in which the debt is created. The actual length of time period may be arbitrarily designated and the analysis may be concluded in terms of weeks, months, years, decades or centuries. The length of the period per say is not relevant. If we choose an ordinary accounting period of one year and if we further call the year in which the borrowing operation take place to, then individuals living in any one of the years will be in the year t_1, t_2, t_3 .... are defined as living in future. An individual living in the year t_o will normally be living in the year t_1 but he is different individual in the two time period.... I shall not be concerned as to whether a public debt burden is transferred to our children's or grandchildren's as such. I shall be concerned with whether or not the debt can be postponed."

Buchanan take into account the concept of Burden with economic welfare instead the stock of inheritance as argued by Pigou. Thus by doing this he explains that in t_o period in which the project is undertaken and financed through borrowing, no burden takes place into period when the resources are withdrawn from the private of full employed economy and put into.

According to Buchanan whether tax or loan finance will shift the burden on future generation depends upon the attitude of the present generation towards their economic well being consequent on the method of resource mobilisation. If the project is financed by tax resources, the tax payers feel worse off because tax is compulsory contribution. Such compulsion will make tax payers feel deprived of their enjoyment of incomes and hence, result in reduction of aggregate welfare.

But such a situation, not found in case of loan finance. If the project is financed through borrowing i. e. through sale of government bonds, no compulsion on the part of citizen to invest in it. The citizens purchase bonds voluntarily. Bonds are also assets and the holding of bonds does not make people feel poorer. They are as liquid as money. Thus as it is a voluntarily contribution, no reason to feel worse off.

When repayment of public debt takes place in future period, funds are diverted from tax payers to bond holders. The tax payers by virtue of their compulsory contribution do feel worse off. However, there is no reason for the bond holders to feel better off because they are just exchanging now the less liquid asset i. e. bonds foe more liquid case in the same way they were not worse off by purchasing bonds at the time of lending funds to government. Since in the future generation the bond holders are not better off but tax payers are not worse off, the aggregate welfare of society is reduced in the case of loan finance of the public investment project. Thus, public debt shifts the burden to future generation.

However, Buchanan's thesis of shifting the burden to the future generation was not welcomed by many economists.[22]

E. J. Mishan has vehemently criticised Buchanan and is of the view that even if the governments expenditure is wasteful, the burden of the debt is not shifted to the future generation and "his logic is diametrically opposed to the one he in fact drawn."[23]

Earl Ralph by criticising Buchanan reiterates that resources must be surrendered immediately and the opportunity cost of these resources cannot be postponed and if not burden cannot be shifted.

e) The Bowen Davis Kopf Thesis

A modified version of Buchanan's thesis of transferability of the Burden of Public Debt is presented by three American economists William G. Bowen, Richard G. Davis and Davis H. Kopf and also known as BDK formula. Likewise Buchanan Kopf also challenge Pigou's thesis.

B. D. Kopf adopts two different views on Burden of Public Debt and explains that, in one case the burden of public debt is not transferable while in another it is transferable.

According to BDK formula, if the real burden of the debt is defined as the total amount of private consumption goods given up by the community at the moment of time the borrowed fund are spent, the cost of public project simply must be borne, by the generation alive at the time when the borrowing occurs.[24] On the other hand, "If the real burden of debt to a generation is defined as the total consumption or private good foregone during the lifetime of that generation as a consequence of government borrowing the attendant public spending, it may be argued that burden will be shifted to future generation.

Bowen Davis Kopf thesis/formula depends or entirely based upon following assumptions.

1. A full employment economy with price stability.
2. First generation all of whom are of 21 years old at the time of the government's loan expenditure say in the year Y.
3. After 44 years when all the member of the generation 1st are 65 years old and the rest of the community is made up of 62 whose members are all 21 years old.
4. A G_3 following the same age sequence and subsequent generation as required.
5. At the time of financing G_1 purchases the bond out of consumption.
6. At the time of retirement G_1 sells the bonds to G_2 who subscribes out of consumption expenditure and G_1 utilized the sale proceeds for meeting the consumption expenditure.

Explanation of BDK thesis

In year Y_0 G_1 purchasing x amount of government bonds and this is done entirely out of reduction in consumption expenditure. Thus due to this, consumption of G_1 is get reduced by x in year Y_0. Later on after 44 years Y_{44}, G_1 sells the entire bonds to G_2 and uses the entire proceeds on consumption. Thus the consumption of G_1 is not reduced. But now the consumption of G_2 will be reduced. This will be continue upto another 44 years when G_2 will receive the x from G_3 and spend it on their consumption, but with this consumption of G_3 get reduced. This process comes to an end when the bond will be paid back. For this purpose additional taxes will be levied. The generation living at that time will bear the burden of tax; no doubt it will be a recipient t_0. But the amount x that it has paid to the preceding generation through its reduction in the consumption will be a net loss and a burden shifted on account of borrowing.

The above analysis can be expressed in following form also.

Year	Generation	Consumption
Y_0	G_1	-x
Y_{44}	G_1	+x
	G_2	-x
Y_{88}	G_2	+x
	G_3	-x

Thus, the bond financing leads to temporary reduction in consumption in the year Y_0, actual and permanent reduction made by the generation surviving at the time of final payment. But if the government decides to extinguish the burden instead of transferring it from one generation to another, the generation which pays extra taxes to meet the debt obligations bears the burden.

Regarding the interest payment on the bonds BDK argues that, "interest payment on the debt represents some burden on each and every generation that must pay taxes to such payment."[25]

Thus, from the above analysis we conclude that as the government expenditure financed entirely out of reduction in consumption the capital equipment remained what it would been if the government expenditure had not been incurred, yet G_1 has shifted part of the burden to G_2, G_3... G_n partly because the deferment of consumption by the Y_0 to Y_{44} is a sacrifice that G_1 never recoups.[26]

The entire analysis is totally based upon the fact that G_1 does not impair the capital stock of the economy, G_2 inherits the same stock of capital from G_1 had there been no government expenditure and on public borrowing. But this analysis criticise on various grounds.

1. If we examine the whole analysis we shall found that they have maintained G_1 has contributed for the purchase of bonds through their reduction of consumption by x in year Y_0 and they recover this reduction in consumption in year Y_{44}, through spending the sale proceeds. Thus according to them G_1 has not damaged the capital stock of the economy. But according to critics this is not so. It is evident from the fact that G_2 compulsorily contributes for the bonds through reduction in his own consumption in the year.[27]

2. According to BDK formula, there is no overlapping in two generation. Means G_1 sells its bonds to G_2 and so on. But they totally neglect towards the view that the bonds may be inherited instead of selling or buying. Thus in such case there is no any reduction in consumption of G_2 as of G_1.

3. The burden can easily be avoided if maturing bonds always replaced by new borrowings.[28]

4. BDK's burden argument will hold good only when taxation is adopted as the measure of redemption.

5. BDK analysis does not take into account the productive and unproductive character of the project.

f) Modigliani's Burden Thesis

Another important theory on the Burden to Public Debt put forward by Franco Modigliani.[29] In his article, "Long run Implication of Alternative Fiscal Policies and the Burden of the National Debt", he explains that, public debt is a burden on future generation because incurrence of public debt results in loss of potential capital formation and the consequent reduction of potential future income. Because whenever the government borrows, funds are transferred from private hands to the government causing a fall in private capital formation.

Prof. Modigliani summarises his burden thesis as follows –

1. Given the government purchase of goods and services, an increase of (real) national debt, whether internal or external, is generally advantageous to those present at the time of the increase.

2. Such an increase will generally place a 'gross burden' on those living beyond that time through reduction in the aggregate stock of private capital, which as long as the (net) mpc is positive, will turn cause a reduction in the flow of goods and services. Furthermore, this loss will tend to occur even when the lack of effective private demand would prevent the maintenance of full employment in the absence of deficit, though the relative size of gain and losses may be quite different in these circumstances.

3. These conclusions hold in reverse in the case of reduction in the real national debt. That is, such a decline is burdensome to those present at the time of the reduction and tends to generate a gross gain for those living beyond.

4. If the rate of interest at the government borrows can taken as good approximation to the marginal productivity of private capital, then the gross burden (or gain) to future generation referred to under (2) and (3) can be measured by the interest charges on the national debt.

5. the gross burden may be offset in part or in too, or may be even more than offset, in so far as the increase in the debt is accompanied by the government expenditure which contribute to the real income of future generation e. g. through productive public capital formation.[30]

Modigliani admits that through productive public capital formation, the burden that falls on the future generation might be offset fully or part or the problem of burden need not arise if the government spends its loan proceeds on productive assets.

g) The Musgrave's Inter Generation Thesis

One of the most convincing theory relating to the choice between loan finance and tax finance, is for public investment project is given by Prof. R. A. Musgrave.[31]

He does not find much justification in searching for reaction of the present generation to tax finance or loan finance. Musgrave goes by justification that cost of public investment project should be borne by users in proportion to the benefit enjoyed. He makes out a case whereby he shows that it is the loan finance and not a tax finance which distributes the cost of the project among beneficiary generation exactly in proportion to benefit enjoys by them. Such inter generation equity is never possible through tax finance.

Prof. Musgrave in his thesis concerned with a long lived government facility, the cost of which is to be distributed equitably amongst those who use it. Musgrave's whole story depends upon following assumption.

"He assumes that the project has a life of three periods and each generation has a life span of three periods. As the first period starts, G_1 in the last period of the span is on the scene, G_2 with one more period to go and G_3 in its beginning. We can explain it with the chart below.

Inter Generation Break Up

I	G^3_1	G^2_2	G^1_3
II	G^3_2	G^2_3	G^1_4
III	G^3_3	G^2_4	G^1_5

Above chart is showing that if only due share of the cost of the project are to be taken from each generation, the share will be in proportion to the period so the breakup of due share of each generation will be as given below –

G_1	1/9th of the cost
G_2	2/9th of the cost
G_3	3/9th of the cost
G_4	2/9th of the cost
G_5	1/9th of the cost

But the central problem is how to get the above shown shares from each generation. Prof. Musgrave is of the view that G_1 should pay $1/9^{th}$ of the cost in taxation and so on. Accordance to him, in the year of construction of the facility $6/9^{th}$ of the cost should be covered by public borrowing but no part of this loan can be taken from G_1 because it is in its late period and the loan taken from G_1 cannot be repaid. Thus Musgrave's reasoning is based upon the fact that loans advanced by any one generation must be repaid within its life span.[32] This $6/9^{th}$ of the cost covered by loan will be taken from G_2 and G_3 and this loan will be paid back to them before they retire by dying. Thus, in Musgrave analysis everybody will get his contribution back except the amount of tax equivalent to his share as calculated earlier.

Thus from above analysis of Prof. Musgrave it is clear that taxation and total cost of the project had been taken from G_1, G_2, and G_3 in 1^{st} period no cost would have been transferred to subsequent generation. It is only on account of loan financing that burden has been transferred to other generation.

But Prof. Musgrave likewise others, also failed to invalidate the argument sponsored by Pigou i. e. "The assumption of no inheritance is the key to this analysis."[33] The problem of taxation would have not been arise if money borrowed has been utilised for productive purpose (purpose of rising productive capacity).

Is the public debt create any burden on present or future generation? Is a matter of great concern among the economists? According to Pigou and some economists, public borrowing does not create any burden except in the case when bonds have been purchased out of saving.

But some economists are of the view that public debt create economic as well as social burden on the present and future generation.

Prof. S. E. Harris explains that, "How great a burden the debt will be depends upon the rate of interest, the tax system, the weight of the other expenditure of government and above all open the level of national income."[34]

According to Prof. Domar, "the burden of the debt or the average tax rate covering the interest charges equals to the ratio of the interest charges to income or the ratio of debt to income multiplied by the interest rate paid on bonds (where the interest rate is given constant)."[35]

Ratchford maintain, "An internally held public debt is an economic burden even when taxes are paid to service the debt in the same ratio as the bonds are held. This is true because of the frictions of levying and collecting taxes and because of the differences in the subjective effects of paying taxes and secondary interest."

Paul Studensky says that, "the burden of public debt can be measured in terms of tax relation which the debt or any attributes of its, bears to the wealth and income of the population, the size of governmental budget and other such factors. The size of the national debt by itself does not indicates its burden.

According to Prof. Lerner, the problem of the burden of the debt should be judged in terms of burden of unemployment the ultimate aim of public debt is to attain level of full employment.

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