Debt has come to occupy centre-stage of macroeconomic writing in recent years because of the secular increase in the debt/GDP ratios in many countries.\(^1\) The striking feature of the rise in debt in this period is that it has happened over periods of peace. In the previous instances, such increases were primarily related to war financing. The macroeconomist's concern has been linked to possible impacts of high debt on output, growth, prices, interest rates and exchange rates in the economy. Even though there exists a large literature on debt, the odd thing is that there is a silence in mainstream writing on issues of distribution (of income) and the impacts on long term growth especially in economies where there is a slack (less than full employment) or there are structural rigidities.

In this chapter we begin by looking at three broad positions on debt financing in economics: the critique of debt financing in classical literature and its neo-classical re-incarnation, the issues raised by the Ricardian Equivalence theory, and the Keynesian (and post-Keynesian) critique of these positions. This will clear the ground to examine literature which attempts to break new ground in this area in the tradition of the Keynes-Classics synthesis. It will also give us an opportunity to

\(^1\) For example the debt/GDP ratio in the USA (of the federal government) rose from 26% in 1980 to 50% in 1997.
engage with the debate in India, which we will take as a representative of the set of developing countries, vis-à-vis the role of budget deficits and public debt. We will also argue that much of the neo-classical and Ricardian Equivalence results are not valid for developing countries and thereby justify an approach in line with the Keynes-Kalecki-Kaldor tradition.

In terms of debt impact -- there are two broad streams in the debt literature. One concludes that debt has no impact on the real variables in the economy. Rational agents realise that the government has a long run inter-temporal budget constraint and therefore if it overspends today by running up its debt then it will raise taxes equivalently in the future. Agents follow a permanent income model and optimise consumption over infinite time. Even if the agents have finite lives they are altruistic and leave bequests so they behave as infinitely-lived individuals. The other stream believes that debt policy impacts on real variables in the economy. However, there is a division in this literature on the direction of movement of real variables and also the causal mechanism. We will broadly classify this stream into two sub-groups. The conventional (neo)-classical view is that an increase in debt leads to reduced growth and capital formation in the long run. It could also have an adverse impact on distribution of incomes where wages could be pushed down.

The second sub-group consists of the Keynesian and post-Keynesian models which argue that debt financing has its role to play in stabilising the economy especially in times of recessions. A suitable mix of increasing debt during recession and increasing taxes during economic upswings would fulfil the long term target of
inter-temporal balanced budget or atleast a stable debt/GDP ratio and at the same
time positively impact on the real variables.

The Keynesian and post-Keynesian models suggest that debt can improve the level
of incomes in developing countries where credit markets are not efficient and the
level of infrastructure is poor. The fundamental difference that creates the variation
in conclusions is the assumption of inter-temporal budget constraints which is an
explicit assumption both in the Ricardian and Neo-classical models but is absent
from the post-Keynesian models. As we will see later, in the Ricardian
Equivalence theory the postponement of the tax burden is not a cause for
theoretical refutation of the theory.

**National Income Identities:**

A useful way of presenting the impacts of debt on income is to use macroeconomic
identities as they provide a framework to analyse fiscal and monetary policy. We
will also use these identities in a later chapter where we look at the issue of
sustainability and discuss the work of some Indian contributors.

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2. Keynes though did have an implicit notion of inter-temporal budget constraints over business
cycles when he argued that under recession deficit financing should be resorted to in order to cover
the gap caused by a fall in private expenditures. However, the interpreters of Keynes in
development economics work within the Keynesian framework but do not use either an explicit or
implicit inter-temporal budget constraint. Part of the reason probably lies in the assumption of very
long planning horizons with high discount rates.
The national income of an economy necessarily equals the aggregate demand and output of the economy summed over its various components -- domestic consumption (C), domestic investment (I), government expenditure (G), exports (X) net of imports (M).

\[ Y = C + I + G + X - M \]

This must equal the income of the economy summed over all its components: Consumption (C), Saving (S) and Taxes (T).

\[ Y = C + S + T \]

Therefore, simplifying the above equations:

\[ S + (T - G) = I + X - M \]

The equations by themselves, however, do not tell a story. The government can introduce (or increase) debt by running a budget deficit either by reducing taxes (T), by increasing government expenditures (G) or some combination of the two. In the short run the government may expect the increase in deficit to lead to an increase in economic activity.

Alternative ways of stating the same equation are as below and we will have occasion to refer to these in the course of our discussion:

\begin{align*}
(3A) & \quad S + (T - G) = I + NX \\
(3B) & \quad S + (T - G) = I + NFI \\
(3C) & \quad S + (T - G) = I + CAS \\
(3D) & \quad CAD + S + (T - G) = 1
\end{align*}

where $NX$ = Net Exports = $X - M$

where $NFI$ = Net Foreign Investment = $X - M$

where $CAS$ = Current Account Surplus = $X - M$

where $S_g = T - G$
This is where most of the consensus ends. The manner in which the story hereafter unfolds represents the different perspectives on the macroeconomic impact of debt.

**Ricardian Position**

We begin by examining the Ricardian Equivalence theorem as resurrected by Barro (1974). As differentiated from the neo-classical school, the Ricardians argue that future generations are linked altruistically to the current generation. Intergenerational transfer of tax burdens (as happens in the over-lapping generations models of Diamond (1965) and Blanchard (1985) is unlikely to occur in the Ricardian case even with inter-temporal budget constraints. This is because agents are forward looking and are altruistic towards their future generations so any prospect of trade off between current prosperity with future tax is immediately discounted in the current period. As long as an individual does not anticipate an increase in family's permanent income s/he does not increase consumption and thereby leaves public policy ineffective in increasing current consumption by a tax cut.

Elmendorf & Mankiw (1998) suggest therefore that the debate over Ricardian equivalence is essentially how different generations are linked to each other. The other models which suggest such links (in addition to the altruism model of Barro) are the "warm glow" model and the strategic bequest model (Bernheim et al 1985). These models do not however yield Ricardian Equivalence results because the

\[
S_f + S + S_g = 1
\]

where CAD = Foreign Saving = $S_f$
current generation does not link current consumption to future generation's tax liability and therefore the size of the bequest. It is also inconsequential whether one chooses the infinitely-lived individual model or the overlapping generations model to evaluate the impact of government policy. What is of consequence is the link between generations.

The validity of Ricardian Equivalence has been challenged both on theoretical grounds as well as empirical. If heterogeneity is introduced in the degree of altruistic behaviour then there is a possibility of breakdown of Ricardian Equivalence (Smetters 1999). In this situation the individual (or family) who has the highest rate of time preference determines the steady state interest rate. All those individuals who have a lower rate of time preference, given this interest rate, will leave no bequests. They will behave as if they were in a life-cycle model -- increase consumption in response to the tax cut and thereby reduce capital formation and raise interest rates. Transfer of tax burdens in these cases will have real inter-generational impacts. However, at the level of the macro-economy there are no impacts of tax cuts since the individuals who have the highest rate of time preference will respond with increasing their saving to the extent that capital stock and rate of interest re-adjust to the steady state level. This suggests that Ricardian Equivalence is a long run rather than as a short run theory.4

4. There are alternate opinions on the validity of Ricardian Equivalence in the short run too (Porteba & Summers 1987).
Some of the more serious objections (or failures) of Ricardian Equivalence could arise due to extraneous factors like capital market imperfections. If some households were constrained to borrow to increase consumption in the current period, a tax-cut allows them to do precisely that and thereby transfer the tax burden into the future thereby violating Ricardian Equivalence. However, if one introduces asymmetric information into this set up then Ricardian Equivalence could be re-established. The asymmetry in information arises from the presence of certain information regarding a future increase in taxes but uncertain future income of individuals. This forces individuals to respond frugally to the current tax cut and thereby save for the future (Hayashi 1987).

The Equivalence achieved above is crucially dependent on the assumptions that future taxes are lump-sum in nature, otherwise they would have additional welfare losses and would be unable to predict the impact of fiscal policy accurately (Bernheim 1987). As it turns out, despite the seemingly deviant recommendations of the Ricardian Equivalence theorem and the immense theoretical and empirical literature that it has generated, the evidence in favour of the theory is "inconclusive" (Elmendorf & Mankiw 1998). The stringent assumptions needed to sustain the Ricardian results would very difficult to sustain in developing countries and therefore not very relevant for our analysis. We turn next to the neo-classical point of view on debt and deficits.
The (Neo)-Classical Position:

The neo-classical Non-Ricardian story goes thus. A budget deficit (financed by borrowing leads to a positive change in the level of public debt) and will lead to an increase in private saving. This increase in private saving may match the fall in government saving (budget deficit) or may not match the budget deficit. If the first option occurs then we are in a Ricardian Equivalence world. However, if the second option occurs, and the rise in private saving is less than the fall in public saving then further possibilities open up. The fall in government saving and the (inadequate rise in private saving) would lead to a fall in aggregate domestic saving implying that the left hand-side of the equation 3 (above) falls and so must the right-hand-side, i.e., investment. Both domestic and foreign investment may fall.

If foreign investment (i.e. investment by domestic investors in foreign assets equivalent to X-M) falls, it would reduce the capital income from foreign sources in future and show up as a fall in exports. Consequently a rise in budget deficit leads to a rise in the current account deficit leading to what many practitioners call the twin deficit theory whereby the causation runs from the left hand side (savings) of the equation to the right hand side (investment) (Obstfeld & Rogoff 1996).

If domestic investment falls it leads to a lower trajectory of capital accumulation and lower national incomes in future. Further, a fall in capital accumulation leads to a rise in the marginal productivity of capital the real rate of interest (assuming we are in a technologically neutral world) and the return on capital.
Simultaneously, the marginal productivity of labour would go down and also its remuneration -- wages. Therefore, the long term consequences of a rise in deficit and debt are: a rise in real interest rates and a fall in wages and a lower national income.

- Monetary Impacts: In the neo-classical framework the monetary policy evolves from the "loanable funds" theory. An increase in debt represents an increase in demand for loans which pushes up the interest rates in the economy. If the monetary authority responds to this by expansion of money supply (to keep interest rates stable) then it translates into an inflationary pressure (since presumably the economy is already operating at full capacity). In the long run nominal rates of interest and prices go up but the real rate of interest remains unchanged. However, the economy is now placed on a higher inflation trajectory.\(^5\)

Interestingly, Sargent & Wallace (1981) argue that though the immediate cause for inflation is monetary expansion, the primary impetus comes from changes in levels of budget deficit (fiscal policy) and therefore in such instances inflation rather than being a "monetary" phenomenon is a "fiscal" phenomenon. The oft cited instances

\(^5\) Interestingly, the USA has shown none of these outcomes in the recent past. The debt/GDP ratio had ballooned in the 80s but contrary to neo-classical expectations inflation rates declined sharply (Elmendorf and Mankiw1998: 13)
include the periods of hyper-inflation in Germany between the two World Wars and in many countries of Latin America e.g., Bolivia in the 1980s.\textsuperscript{6}

Secondary impacts of debt from a public economics perspective in a social welfare framework predicts "deadweight" losses in welfare when government attempts to service debts with (non-lump sum) taxes.\textsuperscript{7} Wicksell (1896) and in more recent times Buchanan & Wagner (1977) have been most forceful in arguing against the use of debt as a means of financing public expenditure. Their critique is partly based on agency-incentive mechanism. If a particular spending proposal will yield benefits over and above its cost of provision then rational agents will agree to find a means of paying for the same in the current period (either by taxation or user fees). If the state is allowed to by-pass the hard budget constraint of a balanced budget then elements in the agency will find it easy to justify certain forms of spending which may not pass the cost-benefit test. This would ultimately lead to a reduced discipline in fiscal management.

\textsuperscript{6} Sargent (1983) however adds that inflation can reduce drastically if government borrowing falls and the central bank provides a commitment not to monetise deficit in future. This is said to have happened in the USA during Clinton's era.

\textsuperscript{7} Any tax causes loss in welfare of the consumer. Public economics theory suggests that the state is able to capture this entire loss of welfare of the consumer if the form of the tax is lump-sum e.g. a head tax, but though these taxes are efficient, violate the tenet of equity. In real life, most taxes are non-lump-sum in nature and therefore, it is widely believed that any addition to tax would cause losses in aggregate social welfare (Cullis & Jones 1998).
All these aspects discussed above have focused on domestic factors. In an open economy (as most economies are and will increasingly be in future due to trade liberalisation), countries with high debt will be more vulnerable to international crisis of confidence. However, the literature is sensitive to the fact that there is a distinction between debt held domestically and foreign debt. Those who are more likely to be prone to international confidence crisis are those who have open economies and also have large proportion of their debt held abroad (Musgrave 1959, Krugman 1991). This would also affect their ability to self-regulate their economies and therefore put to risk their political independence (Elmendorf & Mankiw 1998: 16). In the next section we examine the impact of debt on private saving in both a closed economy and an open economy setting.

**Debt and Private Savings**

Savings is of added importance in this context because saving is directly related to growth in the neo-classical tradition and any variable that affects the levels of saving is also supposed to affect growth. We examine different scenarios here below.

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8. Developing economies seeking international multi-lateral assistance have increasingly experienced the insistence of these agencies on a government commitment to reduce fiscal deficit, implying a cap on debt.

9. Outstanding examples are the Latin American countries (Argentina, Brazil etc.) who in the late seventies had undergone cataclysmic changes in their economy due to high debt which was largely held by foreign agencies. The subsequent Brady plan and the debt-equity swaps is well-documented (Arrow & Boskin 1988). However, there are differing opinions on the genesis of the Latin American crisis and the way-out of it. Some like Friedman (1988) have even gone to extent of suggesting that
(a) **Closed economy scenario:**

There are various channels through which private saving is impacted on when there is a rise in public debt in a closed economy. Let us examine the situation that government spending is being held constant and public dissaving occurs because of a fall in tax collection.\(^{10}\)

Rational consumers would be able to see that this increase in current disposable income is a temporary phenomena and in the long run the government in order to balance its inter-temporal budget will raise taxes to compensate for the current reduction in revenue collection. There would be an increased interest obligation in the government's expenditure portfolio. If we have life-cycle consumers too, then they would quickly put away their additional disposable income into private savings and maintain consumption at its current level.\(^{11}\)

In the current period, however, assuming we are in a world of "loanable funds" theory, an increase in government borrowing would put an upward pressure on the US economy if it extends its high debt phase would lose its economic super-power status if the situation continued for too long.

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\(^{10}\) Public Saving is G-T in our national income accounting equations stated above. A saving could occur either by raising G, reducing T or a combination of both.

\(^{11}\) There is significant silence here on the stability of the marginal propensity to consume (MPC). What is being suggested by the literature is that people stabilise their life-time MPC rather than their current MPC. Alternatively stated, the MPC is stable over the life time income and does not take into account current incomes as the determinant of consumption.
interest rates (loan prices). An increase in interest rates would act as an incentive to increase their saving. Finally, an increased borrowing will lead to higher future taxation in order for the government to finance debt-servicing obligations. If the tax in the corporate sector is non-lump sum then it would lead to distortionary effects in the corporate sector and would impact on the corporate saving behaviour.

**Long Run Impacts on Capital:**

The issue of capital formation is central to determining the future levels of income and the distribution of incomes between different factors of production. These results in neo-classical economics obtain from general equilibrium models which have very similar outcomes in terms of their impact on capital formation.  

(b) **Open Economy Scenario**

Elmendorf & Mankiw (1998) argue that in a small open economy an increase in debt will lead to a one-on-one decline in capital formation. They assume that individuals live for a fixed number of periods and per capita consumption is fixed in each period. Being a small open economy, there are no impacts on the rate of interest as it adjusts to the world interest rate. If there is a one shot increase in debt,  

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12. This point stressed in the neo-classical literature is contradictory. While an increase in interest rates acts as an incentive to save more, an increase in disposable income does not increase consumption. The notion of rationality has to be pushed far enough to arrive at such expectations of consumer behaviour.

13. The earliest of these relate to the Overlapping Generations Model developed by Samuelson (1958) and used by Diamond (1965) to work out the growth impacts of debt financing. However, in
it would lead to an increase in the interest obligations of the government. The only way to finance it would be to increase tax which causes a decline in disposable income. Since interest rates do not change, and savings (private wealth) remains unchanged, it would imply a decline in consumption and income which leads to a fall in capital formation.

This finding is similar to Blanchard's (1985) who uses a Overlapping Generation (OLG) model in continuous time. Individuals are assumed to have a log utility function and a fixed proportion of dying in each period. A one shot increase in debt is permitted and that level of debt is maintained thereafter. The results Blanchard obtains for a small open economy mirror the results of the stylised model of Elmendorf & Mankiw (1998) -- every unit increase in debt leads to a unit decline in capital formation.

The closed economy version of this model, however, arrives at slightly different conclusions. The rate of interest goes up due to an increase in debt (and crowding out of capital). The increase in rate of interest leads to a rise in private saving. Therefore, in a closed economy the decrease in capital formation would be less than in an open economy case. It has however been pointed out that the difference in the open and closed economy case here arises from the assumption of log utility functions which allows for high inter-temporal substitution (of consumption). If we assume lower inter-temporal elasticity rates of consumption, the closed economy comparison to today's sophisticated models, like the Blanchard (1985) and Auerbach & Kotlikoff (1987) models, the Samuelson-Diamond efforts are primitive two-period (generation) exercises.
case would approximate the open economy case in terms of the impacts on capital formation.

This seems to be validated by the Auerbach & Kotlikoff's (1987) findings, which indicate that even in a closed economy there will be a one-to-one crowding out of capital vis-à-vis debt when it is assumed that the rate of substitution (of consumption) is low. As opposed to Blanchard's one shot increase in debt, Auerbach & Kotlikoff (1987) allow for a multi-period increase in debt (by reduced taxation) which is later serviced through increased income taxation. However, like Blanchard (1985), the government maintains the higher level of debt thereafter and only worries about its servicing through increased income taxation. In such a situation the debt policy leads to a decline in saving because it transfers income from future and younger generations (who have low marginal propensity to consume) to older generations (who have a higher marginal propensity to consume) leading to lower aggregate saving and thereby capital formation. The increase in income taxation in latter periods also causes distortions and loss of social welfare.

**The Keynes-Kalecki tradition**

We have till now been looking at the neo-classical debt models which (explicitly or implicitly) assume some form of budget constraint (balanced budget) and incorporate a market clearing mechanism (without major structural rigidities) in all sectors of the economy. The central message that emerges from the bulk of these models is that in the long run debt reduces capital formation. Some authors find
differing outcomes in closed and open economy situations but in-effect they all predict a similar scenario of reduced capital formation due to increase in debt. The assumptions driving this conclusion are the existence of rational agents, complete market-clearing arrangements and inter-temporal budget constraints. This result comes from an implicit assumption that there is full employment in the economy and a fall in saving leads to lower capital formation as opposed to the Keynesian case where investment leads to forced saving.

We now turn our attention to another distinct and distinguished strands of literature which suggest alternate outcomes which has its roots in the Keynes\textsuperscript{14}-Kaldor-Kalecki tradition. Of these, the Keynesian tradition is more popular. Even though the macroeconomic consequences predicted by these theories have similarities they differ in the manner they treat distribution of income as a factor in determining equilibrium outcomes.

The Keynesian influence over macroeconomics and policy-making was most dominant in and around the Second World War in the United States and the United Kingdom. It rose to its peak in the US policy-making circles with the 1963 Council of Economic Advisors' report to the President (which was Keynesian in approach). Thereafter it lost eminence in the dominant academic and policy-making circles

\textsuperscript{14} In this category I would include most authors who work within the post-Keynesian framework and have dealt with problems of unemployment and systemic slacks. This would include the stream of writing that is broadly identified as the structuralist economics with an emphasis on distribution of income.
with the resurgence of the neo-classical stream pioneered by the Chicago school. The Keynesian models assume that an expansionary fiscal policy is called for when there is a slack in the economy — presumably due to economic downturn (recession). In such a situation, Keynes predicted that an expansionary policy would boost the prospects of emerging from a downturn quickly. However, once the economy recovers the government may withdraw so as not to crowd-out private consumption and investment demand (Ackley 1978). In developing countries, at the end of the Second World War, the Keynesian framework presented itself as the dominant economic paradigm. It was also convenient for the newly independent states to adopt such a state-centric framework as it provided a logic for economic intervention in the process of development. Given the existent slacks in these economies, an expansionary fiscal policy hoped to provide accelerated investment without hitting the price trigger. Since most of these states were emerging from the yoke of colonial disinvestment and de-industrialisation, the capital infrastructure base was considered weak. State investment, especially in large-scale infrastructure projects with long gestation periods was deemed necessary (Chakravarty 1988). The newly industrialising states were constrained with not only a small manufacturing base but also low stocks of foreign assets with which to finance imports. The credit and capital markets were poorly organised as were the manufacturing base and infrastructure. The ability of raising capital by private

15. Even if there were inflationary pressures in this grandiose investment programme, it would be due to supply bottlenecks which could only be eased (in a closed economy) by greater investment rather than cutting expenditure (Patnaik 1972, Rakshit 1992).
agents was limited and it led to a situation of market failure further justifying state intervention even in the financial sector.

In India, the level of state participation in development planning and execution has been relatively high. The rate of industrial growth between 1951-1965 was at 7.2% and then dropped to 4% in the period 1966-1975 marginally increasing to 4.9% in the next decade (1976-86) (Chandrasekhar 1988). It has been argued that the simultaneous injection into the economy by public investment ensuring an increase in production capacity and public expenditure ensuring domestic demand to buy up the produced goods of the private sector led to the expansion of the economy in the pre 1965 phase of the Indian economy (Patnaik & Rao 1977). Significantly, in the post 1965 period public investment and expenditure both fell drastically between 1964-65 and 1973-74. The decline in public investment reduced supply of basic inputs while the decline the public expenditure reduced the consumption demand of the manufactured goods produced by the private sector. The decline in aggregate demand led to a fall in private investment adding to the downward spiral. So the question that arises is when the state is aware of its trigger role in the economy why did public investment decline in this phase in India?

A possible answer lies in the reduced resource mobilization by the state which curbed its ability to sustain expenditures. The social surplus, however, was accumulated by the private sector and put into non-core areas including speculation. Couldn’t the government have resorted to deficit financing? Patnaik & Rao (1977) argue that there is an upper limit to which the option of deficit
financing can be exercised and it will run into an inflationary barrier which is politically unsustainable. So the only way the virtuous cycle of growth can be sustained is by way of garnering the social surplus into the state kitty and using it to finance public expenditure.

Crowding In/Out debate

It has also been argued by structuralist economists that contrary to the neo-classical position wherein public investment crowds out private investment, the opposite may be true in the presence of systematic slacks. When initial levels of capital stocks are low, as in developing economies, the likelihood of public investment crowding in private investment is high (see e.g., Chandrashekhar 1988, Patnaik 1986, Rakshit 2000). This implies that an increase in public investment, however financed (including debt) would lead to higher capital formation in the economy. If there is substantial slack in the economy, this would happen in a non-inflationary regime. So the fears of long term decline in capital formation and the economy moving to a higher inflationary path seem to be unfounded in this scenario. If anything, there seems to be reason to argue the case that debt financed investment would probably lead to higher capital formation in a non-inflationary way and not crowd out capital formation.

In an open economy, as we have discussed above, the budget deficit is expected to have an impact on the trade deficit. Neo-classical theory would have us believe that the dynamics run from the internal economy to the external account. We will have reason to examine this proposition in the context of economies where due to
structural rigidities market-clearing Pareto solutions fail to emerge, and therefore could make the neo-classical results invalid. We now turn our attention to the developing country context which are characterised by structural rigidities.

Developing Country scenario:

We begin by presenting a basic stylised developing country scenario. The labour market exhibits unemployment (both disguised and undisguised). The level of infrastructure and industrial development is low. There is a large agrarian sector and the credit and insurance markets are under-developed (Rakshit 1982). There are structural rigidities and market failures in the system. Therefore, the government is typically faced with the task of pump-priming development. Given that the tax-capacity in such an economy is low and if external aid is limited, there are few options for a government to finance economic development but to rely on public debt. The state finances economic development by running budget deficits.

The budget deficits could be financed in two ways -- borrowing from the central bank or borrowing directly by sale of bonds in the open market. If the central bank finances the debt, it leads to an increase in high-powered money and therefore potentially an increase in credit and money supply. Some argue that this could have inflationary tendencies. If it is borrowed directly from the public by open market operations there is no immediate impact on the money market through the money demand or supply route. The inflationary impact in this case runs through the route of real goods market due to increased demand in the economy. We now turn to
such a stylised world where the government finds budget deficit the best option to finance expenditures.

In the neo-classical framework we have been made sensitive to the following:

a) Budget deficits spill-over onto the external account -- to avoid a external account crisis budgetary expenditures need to be restricted.

b) Budget deficits lead to inflation -- The inflation impact works along two axes. First, there is the generation of additional demand due to budget deficit which leads to short run inflationary pressures. Second, if the government finances the deficits with an expansionary monetary policy then it leads to a higher inflationary path by way of higher money supply increasing the nominal prices.

c) Budget deficits lead to an increase in the rate of interest and crowding out of private capital and thereby affect the long-term growth prospects of the economy.

d) If we begin with a BoP crisis, then any expansion of the government expenditures would accentuate the BoP crisis. The only way out is either a reduction in government expenditures or devaluation (or some combination of both).

Let us now examine these propositions carefully in the context of the stylised economy we have presented above.
Twin Deficits in the presence of structural rigidities

The conventional neo-classical argument (as we have seen above) suggests that an increase in budget deficits would simultaneously cause an increase in prices and expansion of the current account deficit. Both prices and output are upwardly affected (and the relative increase in either would depend on the degree of initial slack in the economy). This leads to an expansion of the trade gap on two fronts: (a) The increase in domestic demand (thereby real incomes) leads to an increase in importables on the income account. (b) The increase in domestic prices makes imports cheaper and reduces demand for domestic products by substitution.

However, if there are structural rigidities this mechanism (causality in the twin deficit theory) may not function the way as anticipated above (Chandrasekhar 1997, Dutt 1997, Rakshit 1991 & 2000). In most developing economies, imports are restricted or regulated both quantitatively and qualitatively. The degree of openness (as well as the level of import duties imposed) is actually a function of the amount of foreign assets with the central bank. The level of imports is often found to be a lagged function of the disposable foreign exchange receipts of the government. This is the sum of earnings from exports plus the aid, loans and remittances minus foreign debt service payments.

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16. Of course, with the WTO agreements in place, the system of explicit quantitative restrictions in most commodities have been phased out. However, implicit and non-price barriers continue even in the developed countries.
This implies that an increase in budget deficit may not necessarily increase the imports (and by implication the trade deficit) because the level of imports is being determined not by the level of domestic demand but by the level of foreign exchange receipts of the government. In the medium and short run, except for exports, the other items (i.e., aid, loans and remittances minus foreign debt service) is not affected by changes in aggregate demand. Therefore, there may not be a spill-over of the increase in domestic demand on the balance of trade (at least not by way of increased imports).

The implications of such a scenario are quite fascinating. If the trade deficit is immune to changes in domestic aggregate demand, and assuming that exports are constant, then what could really affect the trade deficit? Since existing debt service payments are pre-determined, the only factors that are variable and lend flexibility to the trade deficit is aid, loans and remittances. If an autonomous increase in aid, loans and remittances from foreign agencies occurs, then the aggregate disposable foreign exchange with the government will increase. Given the above analysis, this would lead to a relaxation of import controls, causing an increase in imports and therefore an increase in the trade deficit. The increase in trade deficit will spill-over onto the domestic economy and impact on the level of the fiscal deficit suggesting a reverse causation from the external sector to the domestic sector (Rakshit 1991).¹⁷

In conjunction with the earlier national income identities, it means the following:

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¹⁷. This is assuming that the government were committed to maintain the level of domestic activity.
I-S + G-T = M-X

I-S + Fiscal Deficit = Current Account Deficit

If the right-hand side of the equation increases, then assuming that I-S is unchanged, fiscal deficit will go up. While this does not negate the twin deficit theory, it fundamentally reverses the causation -- right-hand side now being the independent variable and the left-hand side being the dependent variable and sensitises us that the two gaps in the system may work in a direction opposite to what is conventionally conceived.

**Budget Surplus and Trade deficit**

We have been concerned above at the prospects of a budget deficit causing a trade deficit or vice-versa. However, is it possible that a budget surplus can co-exist with a trade deficit? The answer to that question turns out to be in the affirmative as we will demonstrate below. In the context of the equation above, it would imply that the right hand side is positive but with a budget surplus, tax revenues are greater than public expenditures. Perforce then private investment in the economy must exceed private saving. If domestic investment is not large enough to meet this requirement then it would (in an open economy) increase foreign investment irrespective of the level of domestic interest rates.

The US economy in the last three decades is an interesting case study in this context. Since 1971, the US economy has had a current account deficit and after 1985 the US trade deficit has accelerated with the rest of the world (except 1991)
reaching about $1.6 trillion (US) in 1998. For a while commentators used the twin deficit argument to say that since there was a budget deficit it was spilling onto the current account and if the budget was balanced the trade balance would follow. But towards the end of the 90s, US government managed to turn the budget deficit into a surplus and trade deficit increased even more rapidly thereafter defying conventional neo-classical theorizing (Elmendorf & Mankiw 1998). In several Latin American countries in the eighties, we have witnessed trade surpluses (though not necessarily current account surpluses due to interest repayment obligations) co-terminus with fiscal deficits. Do these observations have an explanation?

Twin deficits and the mode of financing

Until recently the literature did not tackle this phenomenon very explicitly. The early empirical studies of open economies with fiscal deficits do not formulate the issues of budget deficits, trade deficit and exchange rates in a systematic manner. Some have examined the association between exchange rates and current account deficits (Mussa 1984) while others examined the association between fiscal deficits and exchange rates (Evans 1986). The models with small open economies and fiscal deficits fall into two categories. One set assumes finite horizons and deficit financed by issue of bonds. The agents however, know that the bonds will be redeemed by increase in future taxes (Buiter 1987, Frenkel & Razin 1987 and Daniel 1993). The possibility of a switch to printing money finance is not anticipated and therefore examined in these models. The second set of models such as Drazen & Helpman (1987, 1988) examine the consequences of financing fiscal
deficits either with money or taxes but arrive at the Ricardian equivalence result because they assume agents to have an infinite horizon.

However, none of these early contributions address the issue of deficit and surplus on two accounts emerging simultaneously within a theoretical framework. Kawai & Maccini (1995) argue that under some circumstances a budget deficit can emerge even in the presence of a trade surplus. If agents are forward looking but have finite lives and there is a constant population then the mode of financing (without any shocks to the system) would determine whether there would be a trade deficit or surplus when a current tax cut is induced. Evidently, Ricardian Equivalence is ruled out by assumption. Since there is perfect foresight in the model, any changes in the rate of interest and price are anticipated by the agent. If the agents anticipate that raising future taxes will in future cover the fiscal deficit then a current account deficit will emerge on the external account. However, if agents anticipate the financing of the deficit by inflation tax in future then a current account surplus will emerge simultaneously with the fiscal deficit. This is termed as the "Unpleasant Fiscal Arithmetic" (Kawai & Maccini 1995).

Suppose, the government undertakes a tax cut to start with. The agents expect this deficit to be closed by a permanent tax at a known date in future. This would initially lead to a rise in consumption due to an anticipated increase in life-time wealth (Wealth Effect). This happens because households have finite horizons and the positive effect of current tax cut outweigh the negative impacts of future tax
rise on wealth. The increased domestic consumption leads to an increase in current account deficit and a decline in net foreign assets.

As the adjustment period approaches (when taxes will go up), wealth declines and agents reduce their consumption below their original level. Finally, this decline in consumption arrests the rising current account deficit and brings it back to its original level. The new equilibrium consumption level is below the original level. Also, during this entire period there was a deficit on the current account, the net external assets fall to a new low level. Interestingly, the exchange rate depreciates right through the adjustment period since the economy moves to a new level of domestic inflation (Kawai & Maccini 1995). Note that current account deficit is equal to the national income minus the domestic absorption. The above result is premised on the assumption that national income is fixed and any increase in domestic absorption will spill over on the external account. This is a standard given in the neo-classical framework as we had occasion to discuss above.

Consider now the case where there is an issue of bonds to finance the initial cut in lump sum tax but agents expect that in future these bonds will be redeemed not by increases in fiscal tax but the use of seigniorage (money). So, at some period in future, the money supply is expected to go up and an inflation expected to follow.

18. As the model is set up there is no monetary impact since money supply has not been increased and real money balances and exchange rates are unaffected. There is, however, an increase in the rate of inflation and the nominal interest rate sufficiently to offset any increase in consumption so that holding of real money balances remains unchanged. So aggregate wealth rises and causes an increase in consumption.
Since agents are forward looking and anticipate future inflation, they make adjustment in behaviour at the start itself. Nominal interest rates go up and real money balances fall, as does wealth. The fall in money balances here outweighs the rise in wealth due to a fall in current taxes. This leads to a fall in current consumption and consequently domestic absorption. The current account moves into a surplus -- an unpleasant fiscal arithmetic. Due to domestic inflation, exchange rate depreciates but net foreign assets rise to a new level since the current account is in surplus right through the adjustment period. Consumption reaches a higher equilibrium level since total wealth in the system has increased.

In addition to the above explanation of a generalised open economy the movements of aggregates in the US economy have to be understood in a larger global scenario. The USA unlike other economies cannot be treated as a small open economy since the US dollar is the currency for transaction and asset holding by the rest of the world. Let us examine the post-Keynesian explanation of this phenomenon in the USA (Brockway 2001).

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19. The tax cut financed by bond issue does lead to a fiscal deficit but not a current account deficit. An obvious post-Sargent-Wallace (1981) counterpart to the "unpleasant monetarist arithmetic" which implies that a tight money policy today may induce inflation. Due to the operation of an inter-temporal budget constraint, in an overlapping generations model, money supply is expected to rise in future. This creates expectations of inflation which override the current monetary contraction and lead to inflationary pressures in the current period itself.
It is significant that the US current account deficit emerged in the 70s and can be explained by OPEC's demand that all payments for oil be made in US dollars. Over time, most international transactions between nations took place on the basis of dollar exchange. Since only the Federal Reserve Board could print this currency, the rest of the world had to sell their commodities to the USA for dollars (instead of goods) as long as they wanted to import oil from OPEC countries or trade with other countries. This led to increasing demand for dollars thereby negating any possibility of the US's ability to balance its current account by itself.20

Importantly, the USA demonstrates that a trade deficit can co-exist with a budget surplus not only as a theoretical curiosum but in real life. It also points to something more ominous. Since the supply of the international currency of exchange is controlled by the US Federal Reserve, movements in the money supply would affect not only domestic interest rates but world-wide interest rates too. The impact on the money supply and interest rates of all non-US governments would happen irrespective of whether they trade directly with the USA or not as long as the international currency of exchange is the US dollar and the country is involved.

The earlier attempts at examining money financing of deficits assume that it occurs in the current period (Kouri 1976, van der Ploeg 1991). They do not however examine the case where the current gap is financed by borrowing and the bonds are redeemed in future with money creation.

20. It might be worth asking why the dollar was chosen as the medium of international exchange especially by the OPEC. Brockway (2001) suggests the following reasons: a) By using a single currency for exchange the OPEC was shielding itself from currency variations; b) USA was the single largest world trader (exporter and importer so countries would find it easy to use it as a medium of exchange; and c) USA was also the largest customer of OPEC products and also its largest supplier of commodities (including military hardware).
in international trade. This implies that if the Federal Reserve increases interest rates it would result in an increase in international interest rates and vice-versa. It is also evident that the Federal Reserve does not need to increase its rate of interest to attract foreign investment, as it would happen automatically in order for the economy to achieve its macro-economic balance.

Money Market and Causation

In the context of the twin deficit theory let us examine the implications for the money market equilibrium and inflationary pressures in the economy when the reverse causality is allowed to operate. Deficit financing is the level of borrowing undertaken by the government from the central bank and is directly linked to the level of reserve money creation by the central bank.\(^{21}\) The budget deficit (BD) then is a function of the reserve money creation of the central bank. Reserve money creation is assumed to be the independent variable and budget deficit the dependent variable. If the central planner wanted to check the growth of the budget deficit, and therefore high powered money, all s/he would need to do is cap government borrowing. This story suffices as long as the economy is closed.

Once we deal with an open economy, the inflow of foreign assets can disturb the internal equilibrium. High powered money which includes net addition of foreign assets held by the central bank, now becomes vulnerable to movements on the capital account. An inflow of foreign assets would increase the high powered

\(^{21}\) Government borrowing enters as an asset on the bank's accounts on the basis of which it creates fresh reserve money.
money in circulation (and by implication budget deficit and inflation). However, multi-lateral agencies like the IMF feel that in order to stabilise the BoP it is not sufficient to reduce credit but what must be targeted is the fiscal deficit. The argument is as follows. The government finances its deficit by borrowings from the central bank as well as other sources. When there is a cap on central bank lending to the government, additional borrowing by the government to finance increased fiscal deficits is possible only by direct borrowing from the open market. This would have two consequences -- it would increase the rate of interest and also crowd-out credit thereby shrinking the options for other non-government agents to borrow in the market. Therefore, it would not be sufficient to target credit off-take to the government from the central bank but to directly monitor the level of fiscal deficit. A decline in the fiscal deficit would automatically ensure a decline in the trade deficit too.

On the other hand, a decline in fiscal deficit due to a contraction of government expenditures could lead to a fall in aggregate demand and hence cause recession. The recession would be far more severe if private investment falls because of a cut in government expenditures. We have had occasion to point out above that private investment could be directly related to public investment and a decline in public investment could severely lead to a fall in private investment. A decline in fiscal deficit would not cause a recession if, however, there is an autonomous increase in net foreign asset inflow. Under a situation of full employment and stable velocity

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22. This is different from the position articulated by Polak (1957) where the policy recommendations were akin to the neo-classical position of credit contraction. However, significantly Polak was not
of money, an increase in net foreign assets leads to an increase in credit (money supply). Since money markets are assumed to clear, this would imply an excess of credit in the market and a fall in interest rates. A fall in interest rates would lead to an increase in investment and thereby demand (income). Therefore, the only instance when a fall in fiscal deficit can be non-recessionary is when there is an autonomous increase in net foreign assets takes place (Chandrasekhar 1997).

The critique of possible contraction spurred a further revision of the theoretical foundations wherein the monetary approach to the BoP was combined with a neo-classical growth model (Khan & Montiel 1989). This suggested that (assuming money market equilibrium exists) every rate of growth has an associated unique level of inflation. This argument is somewhat in line with the Harrod-Domar growth model (but without a theory of financing) (Easterly 1997). It turns out that in this model the domestic growth rate determines the level of foreign saving (current account deficit) necessary in the economy. In the monetary model, prices and growth rates are inversely related while in the growth model they are positively related. In the growth model an increase in prices causes a decline in exports thereby increasing the trade deficit necessitating foreign borrowing to finance the trade gap (which is equivalent to foreign saving). An increase in saving –the sum of domestic and foreign saving –implies an increase in growth rates.

In developing countries, however, the causation is probably the reverse. It is the exogenously available level of resources that determine the ability of an economy operating in a full-employment framework.
to raise its growth rate beyond domestically available resources. A reality check on
the flow of funds for financing domestic growth (especially in developing
countries) indicates that international flows are structurally determined and have
little to do with marginal productivity of capital. In a significant contribution
Feldstein and Horioka (1980) found that there is a very strong correlation between
domestic investment and domestic saving implying that foreign saving has little
impact on domestic investment. It also means that an increase in budget deficit has
little impact on international flow of capital even with open capital accounts.

The Devaluation Argument

Let us look once again at the mechanism of an expansionary fiscal policy causing a
simultaneous decline in domestic production (employment) and increasing the
trade deficit (because of greater internal absorption). Devaluation of the exchange
rate is one of the solutions offered by this strand of the literature to deal with the
problem of persistent current account deficits. A devaluation in the country's
currency would make exports more competitive (and increase employment) and
also reduce imports (because domestic products become relatively cheaper) thereby
reducing the trade deficit.

However, devaluation would work if and only if

23. Understandably, the solution to the crisis therefore does not lie in fiscal expansion but
contraction. However, this holds if there are structural bottlenecks to increasing production in the
domestic economy at a price lower than the border prices. If capacity of production can be
expanded, the increased domestic absorption can be met without disturbing the external sector.
(a) other countries also did not resort to compensatory devaluation -- a compensatory devaluation by other competitor countries would take away the price advantage in exports.

(b) Marshall-Lerner conditions hold (existence of a high elasticity of exports and imports). If the price elasticities of the exportables and importables is less than one -- i.e., if price elasticity is low then changes in the exchange rate will not have the desired affect on the trade balance (as demand is price inelastic). Additionally, devaluation could lead to shifts in income distribution, a decline in the marginal propensity to consume (MPC) and thereby reduce the size of the multiplier (Chandrashekhar 1997).

Trade Liberalisation and Investor confidence

The other suggested solution to a BoP crisis is to liberalise trade and allow the currency to be under a floating exchange rate regime. The currency should be left to float, so that it can attain its market-determined price. This would lead to a sustainable level of BoP. Devaluation will make exports internationally competitive and at the same time reduce imports. The implicit theory behind this argument is that there are no cost-push effects. For example, if international...

24. Nominal devaluation is accompanied by real effective demand.

25. It is normally assumed by those who prescribe these polices that LDCs under a regime of fixed exchange rates have over-valued currencies. The domestic currency is believed to be propped up by the central bank even though the domestic level of inflation is higher than the international rate. Once they are allowed to float, so the argument goes, devaluation would establish the market-determined price.
commodities have a fixed international price (in terms of dollars) and an economy undergoes devaluation would increase the cost of production of the domestic commodities if the imported commodity is used as an input in the domestic production process. The only way that costs can be curtailed is if the share of workers or capitalists is reduced to keep the price low.

The trade liberalisation exercise is supposed to perform another implicit function. It is supposed to be a confidence building measure. Foreign direct investors feel encouraged to bring in capital and thereby reverse any recessionary trends that might emerge from the trade liberalisation programme. In the very short run, trade liberalisation might lead to high imports (to fulfil pent-up demand for foreign commodities in the economy) and temporarily push up the trade deficit, but in the medium run would stabilise.

Financial Liberalisation

The literature on policy issues argues that flows in foreign investment and finance is dependent on investor confidence in the economy. It is in this context that a case is made for financial liberalisation with reduced government monitoring of interest rates,26 alongwith an increased openness of the financial system. As the economy undertakes financial liberalisation, investor confidence is expected to grow and

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26. When the interest rate is market determined in a liberalised financial system, for the capital account to balance the international interest rates must prevail in the economy. In a LDC there might be a mark up for perceived riskiness of the economy vis-à-vis the rest of the world.
there is an inflow of foreign investments causing an increase in foreign assets, investment and growth. The problem with this line of reasoning is that financial liberalisation often ends up attracting foreign speculative monies especially in weak financial markets which lack an efficient regulator. Such funds are invested in relatively liquid assets and are immensely mobile seeking short run profits which could de-stabilise the financial fabric. A financial downturn could lead to a system-wide crisis involving real variables. Some commentators believe this to be true for the East Asian economic crisis in the mid 1990s (see, e.g., Feldstein 1998, Krugman 1994, Rakshit 1998 and Wade & Venoroso 1998). In India's own recent experience, huge inflows of foreign finance capital have caused no growth acceleration.

While on the issue of financial liberalisation and investor confidence it may be worthwhile discussing some of the commentaries on financial management and increasing risk premium reflected in either higher interest rates or increased conditionalities imposed by international lenders and their impact on deficit and debt management. Using a neo-classical framework some studies in India have argued that increased borrowing by the government (to finance fiscal deficits) has increased the cost of borrowing. Nachane et al (1997) use a hybrid of a Hicksian IS-LM framework as well as a loanable funds theory which is fundamentally contradictory. We present the model however for discussion. In Nachane’s model the increase in government expenditures is expected to shift the IS curve to the right. The increased expenditure is financed by sale of bonds. The excess supply of bonds leads to a fall in price of bonds (and an increase in the rate of interest). It is
assumed that the money market is flexible and the market determines the rate of interest as in the loanable funds theory (discussed earlier). The long run natural rate of interest is established by equating the demand for loans (which depends on the level of real productivity of capital) and the supply of loans (which depends on the thriftiness of savers -- psychological factors). The increase in rate of interest is therefore a consequence of increase in the natural rate of interest and the risk premium as anticipated by lenders due to an increase in debt of the government.

These arguments must of course be qualified by the implicit assumptions that they make. The movement of the rate of interest due to changes in demand and supply are dependent on the establishment of a flow equilibrium of loans rather than stock equilibrium decisions (choice of portfolio or liquidity preference) which ensures a move to a general equilibrium of the system. However, if we do introduce portfolio choice as a factor determining outcomes then we are moving into the arena of stock equilibria which may not be simultaneous with flow equilibrium. In such a situation there is no guarantee that a full employment equilibrium will get established. However, even if we did not bring in the issue of portfolio choice here we would still be making implicit assumptions about the dynamics of equilibrium in such an economy. The two most easily cited impacts of increase in fiscal deficit seem to depend on the mode of financing of the deficit -- borrowing or issue of currency.

27. This of course is a restatement of the classic Keynesian position (Keynes 1936).
If the increase in fiscal deficit occurs through an increase in money supply it should by conventional neo-classical theory increase inflationary pressures in the economy. However, monetisation of deficit may not impact on prices at all if the real demand pressures created by the excess government expenditures do not exceed the production capacity constraint in the economy. Increase in money supply in such situations will only add to the bank reserves which may even prompt banks to reduce interest rates. Alternatively if the size of the Keynesian multiplier (at the given interest rate) were greater than the product of the money multiplier and the income velocity of money, then it would push the rate of interest up due to excess demand for money being generated in the economy. Note that prices would be unaffected in this process. As the argument suggests, if there are slacks in the economy, as there would be in a developing country, then one has to be careful in adapting market-clearing models for macroeconomic judgement (Patnaik 2001). Let us now examine the case when the entire deficit is financed by borrowing (increasing debt). By conventional neo-classical theory, interest rates in the economy would go up. However, this necessarily assumes that there are no excess reserves being held by the banks when the fiscal deficit was being created. If there was excess credit in the system then there is no reason why there would be a credit squeeze or financial crowding out causing an increase in interest rates. However, if the system had a production constraint, excess of public expenditure would increase prices. Therefore, while reading impacts of deficits one must be careful in understanding that predictions of increase in prices assume that the system is supply constrained and predictions of increase in interest rates assume that the system is credit constrained (Patnaik 2001).
There have been very few empirical investigations of the link between interest rates and deficit/debt in the Indian economy because prior to the mid-1990s the interest rate regime was strictly regulated and would not therefore show any relationship with the fiscal deficit. Only recently some studies have started trickling in and two notable ones which we will discuss here study the fiscal deficit and interest rate dynamics – Chakraborty (2002) and Goyal (2004). Both these studies use a Vector Auto-regression (VAR) model and attempt to find a relationship between ex-ante real interest rates and fiscal deficits.  

Chakraborty (2002) looked at time series data for the period January 1993 to December 1999 on a monthly frequency. The causality tests on fiscal deficit and interest rates suggested that higher interest rates seem to lead to higher deficits while the reverse was not true. This confirmed the Indian situation wherein the share of non-interest expenditures in total expenditure was declining, indicative of the rising interest costs of debt servicing. This is in also conformity with what many economists like Patnaik (2001), Rakshit (1991) have been hinting at for quite sometime that the real rates of interest in India have to be brought down in order to contain fiscal deficits.

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28 While fiscal deficit data is available easily, there are no estimates of the ex-ante interest rates. The series for ex ante interest rates were generated as a sum of the real rate of interest and expected inflation (The expected nominal interest rate = Actual real interest rate + expected inflation). The latter variable in turn was generated with the Hodrick-Prescott (HP) filter to model inflation with the consumer price indices. The ex-ante real rate of interest then is derived by subtracting expected inflation from nominal interest rates.

29 A proxy of the monthly fiscal deficit value was generated since official sources do not provide monthly fiscal deficit figures.
Goyal (2004), in contrast, examined Indian data between April 1996 to September 2001 and found that there is a two-way relationship between interest rates and deficit. While this may be interesting statistically, for the macroeconomist/policy-maker this is confounding because it defies uni-directional relationships between variables. The reasons for suspicion grow when he suggests that current fiscal deficit is not influenced by past levels of deficit independent of fiscal deficit trends but interest rates are history dependent. He also points out that the changes in level of reserve money (over and above the statutory requirements) is unrelated to both the fiscal deficit as well as interest rate. These findings are theoretically contradictory.

If there is a two-way causality between deficit and interest rates then there should be some relationship between deficit and reserve money but the econometric results indicate none. There is no explanation offered why deficits should impact on interest rates in the presence of excess reserves lying with the banking system. This obviously implies that the credit off-take in the market is insufficient to clear the excess supply at the prevailing interest rates. This shows up the contradiction in the model that Goyal (2004) has in mind wherein he suggests that a rise in deficit leads to increase in interest rates. This would only happen if there was a short supply of credit in the market, which is not the case here. Goyal’s results swings both ways, providing security to both Neo-classicals and Keynesians, but, there are

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30 In terms of policy this is good news because the finance minister can get up one morning and say that though we had double digit deficit last year, this year we will have a budget surplus.
some missing links in his analysis that need to be fleshed out. In the next section we will examine the Post Keynesian theory of money market equilibrium and interest determination which differs from the ones we have discussed till now.

Post Keynesian

There is of course a completely different understanding that the post-Keynesians have of interest rate determination and money market equilibrium in a closed economy. This school argues that the rate of interest is not market determined (by demand and supply of loans) but by the monetary authority. This theory gains currency from the fact that announcements by the monetary authority in different countries have profound influences on the interest rates. So if the target of monetary policy is to stabilise the rate of interest then the supply of credit is demand determined in the economy. What this implies in the IS-LM framework is that the LM curve is horizontal in the long run (Moore 1988) and the supply of money is infinitely elastic with respect to interest rates. This formulation of the economy is in complete contrast to the manner in which the general equilibrium models and the neo-Keynesian models (e.g. Aghion et al 1999) in macroeconomics have been formulated where the interest rate is endogenously determined.

Does this affect the analysis substantially? It does. If interest rates are determined exogenously then high fiscal deficits cannot be the cause but can well be the consequence of inefficient interest policy on the part of the monetary authority as we have discussed earlier too (Sood 1997). In an open economy, therefore, there is little that the monetary authority can do vis-à-vis money supply and interest rate as
all countries must adjust to international real rate of interest. This by implication
states that the onus of intervention therefore lies with the fiscal authority.

We now turn our attention to another area of contested claims in macroeconomics.
What happens to equity when there is (rapid) growth?

Inequality and Growth

There are two fundamental issues in growth economics that have been the focus of
long standing debate. The first is the issue of convergence. This states that all
economies over time would converge to the same rate of economic growth (Barro
& Sala-I-Martin 1995). This is a logical follow-up to the Stolper-Samuleson
theorem which states that economies which are open to trade in goods and services
and allow free movement of capital would tend to equalise factor rewards.
Fundamentally what was being argued here was that there was no need to free
movement of labour since wages would equate across countries participating in
trade by the movement of capital and goods.

The second is the issue of distribution of incomes within economies in the process
of growth. The empirical work of Kuznets indicated that economies seem to
demonstrate an inverted-U with regard to distribution and growth in per capita
incomes. So those at the lower and higher end of the growth spectrum would face
acute inequality which would approach a more equitable distribution as per capita
incomes grow in economies. These empirical findings were in line with the models
of growth and distribution of Kaldor which predicted that higher growth could be
achieved only with greater inequality in distribution. However, on both these issues there is sufficient empirical literature available to suggest that neither the convergence nor the inequality-growth link is robust. The recent growth experiences in much of Africa and Asia indicates that there is widening gap in the per capita incomes across nations despite mobility of goods and capital across national boundaries.

On the issue of income distribution and growth there is also a rich body of literature within the neo-classical framework that proposes that higher levels of equality lead to higher growth. Kravis (1960) and Lydall (1968) find a strong correlation between income distribution and incomes: richer countries demonstrate lower levels of inequality. Some recent empirical work finds strong correlation between higher levels of income and growth with lower levels of inequality in income (Persson & Tabelini 1994).

Part of the reason why intra-generation distribution issues disappeared from the macro-economic research agenda was because there was an increasing use of representative agent models which by assumption were silent on issues of distribution. The resurgence in studying issues of distribution is due to seminal contributions of Becker (1975). In some ways it is also one of the precursors to the New Growth Theory which attempts to explain economic growth as a consequence of endogenous stimuli (see Romer 1986, Lucas 1988 and Mankiw et al 1990).
This strand of literature highlights the role of investment in human capital in explaining distribution of incomes. Becker (1975) suggests that initial endowment (wealth inheritance) would not come in the way of long run convergence of incomes in an economy and therefore not affect equilibrium but wealth distributions could affect economic activity in the short run if there are credit market imperfections (Atkinson 1974, Becker 1975). Those who are not born with sufficient endowment of wealth find credit more expensive and this impacts on the level of investment on human capital and aggregate output. However, in the long run, even under credit imperfections, effect of wealth distribution disappears as all initial distributions converge to a unique ergodic distribution (Loury 1981, Scheinkman & Weiss 1986 and Banerjee & Newman 1991). The literature in this area seems to suggest that income inequalities among nations exist because of differences in investment in human capital (Mankiw et al 1990).

Subsequent contributions however suggest that long run income inequality can persist if there are credit market imperfections and non-convexities in technology (Galor & Zeira 1993). This set of models use overlapping generations in an open economy scenario to demonstrate results of income distribution models combining the insights of human capital models a la Becker (1975). They supplement findings of Mankiw et al (1990) in the sense that long run income inequalities are linked to differential investment in human capital through credit market imperfections.

Let us describe this model briefly because it has interesting implications. As in a simple overlapping generation model, each agent lives in two periods (Galor &
Zeira 1993). In the first generation each agent has an option of either working as unskilled worker or going to school. If s/he goes to school then in the next period s/he works as a skilled worker. But if s/he does not go to school then in the second period too s/he continues to work as an unskilled worker. Why would someone not want to go to school even when it is known that remuneration as a skilled worker is greater? It costs money and not everyone can afford to go to school!

There are three categories of agents according to their initial endowment. There is one category that inherits wealth, can pay for their education and may even be in a position to lend money in the market. The second set consists of those who do not have an initial endowment to pay for the education but can borrow from the credit market to pay for their education and later pay back their debt in the second period when they are income earners. There is, however, a third category who do not have enough to finance education either by inheritance or by borrowing (because credit markets are imperfect) and education is lump sum or step-wise in character. Not only is there a short run impact of inequality on aggregate production but also a long run impact.

The economy settles down into a two class society where there is a rich and a poor class (as in the Kalecki-Kaldor models where there are two classes capitalists and workers). The size of the two classes is crucially dependent on the cost of education and the degree of credit market imperfection. Interestingly, the model

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31 This refers to investment in human capital and acquiring education.
finds that an economy with more equitably distributed incomes ends up with generating greater income and wealth – a result consistent with empirical findings of Persson & Tabellini (1994). While these results are historically dependent, as anticipated, there is no attempt here to engage with the dynamics of inheritance and initial (primitive) accumulation. How did the wealthy become wealthy and the poor become poor? There is a stated silence on this issue.

In the genre of models which signify a departure from the use of a single representative agent and emphasise credit market imperfections are also contributions like Aghion et al (1999). This model follows Keynes and Kalecki in separating out the savers from the investors by activity. As a direct consequence of credit market imperfections which permits only a certain amount of borrowing from the savers there is an upward bound on the level of investment (by invoking a form of the credit multiplier). They also presume that business cycles are necessarily inefficient and undesirable. During depression the excess of savings is an indicator of inefficient use of the liquidity in the system.

Unlike the conventional neo-classical models, Aghion et al (1999) distinguish between two different agents in the economy -- savers and investors on the basis of market imperfections. It belongs to the genre of new macro-models which attempt to broaden the ambit of results by using multi-representative agents (as in Galor et al 1993). However, it resembles the neo-classical macro-models in an important way -- by assuming that the banking sector cannot independently (of savings by
individual agents) adjust credit flows and therefore increases in credit demand lead to a rise in rates of interest.\textsuperscript{33} There is therefore an implicit assumption of the loanable funds theory in operation which is a derivative of the Keynes-Classical synthesis (see Ackley 1978).\textsuperscript{34} They attempt to provide a theory of business cycles which is driven by capital market imperfections and unequal access to investment opportunities. Two parameters assume importance. One, is the credit capacity (v) of the prospective investor and second is the proportion of labour income (\( \mu \)) going to those who can actively invest (like the top echelons of management). It represents the income differentiation among the category of wage earners.\textsuperscript{35} The degree of separation leads to increased macroeconomic volatility around the steady state growth path and converges to a cyclical path around the steady state.\textsuperscript{36} This indicates both a poor credit market (high v) and high physical separation between savers and investors (\( \mu \)).

\textsuperscript{32} It is interesting that these results are valid only for countries with democratic forms of government.

\textsuperscript{33} The interest rate is endogenously determined by the demand and supply of savings.

\textsuperscript{34} In a modern paper currency-based economy there is no reason why the banking sector needs to raise the rate of interest in order to increase the level of credit in circulation in the economy. The level of credit created is essentially dependent on the decision of the monetary authority in terms of what it considers to be a safe asset reserve. An increased demand for credit could be met by keeping interest rate stable and reducing the reserve requirement.

\textsuperscript{35} The higher is "\( \mu \)" the greater is the degree of inequality in the system.
The cycles emerge in the following manner. Assume that the starting point is a period of boom. The high investment (boom) leads to higher profits which drives higher investment in the next period. However, the higher investment also implies a greater demand for loanable funds thereby raising the rate of interest. This has a negative impact on the investment and therefore growth. In periods of low growth, as investment drops, savings are in excess supply, leading to a fall in the rate of interest. Investors, who have borrowed in the market, now are able to retain a greater part of their profits as interest rates drop. Increase in net profit boosts their assets and therefore the ability to invest in the next round and slowly works its way to a boom. The cycle thereafter repeats itself.

It is important to note here that the period of the boom is also crucially dependent on the credit capacity (size of v), which defines the credit constraint in the economy and μ which is an indicator of the size of active investors (μ). If there are few active investors and there is a credit constraint, then the boom period is likely to be shorter. This is not unexpected because access to credit as well as the number of investors will determine the extent of the investment in the economy. On the other hand, if the degree of separation is low and μ > v then there will be a permanent boom and the stable steady rate growth is achieved. This rate of growth coincides with the Harrod-Domar growth rate and the economy uses its saving in

\[ \text{This cycle happens unless } \mu \text{ is very small or } v \text{ is very large. Separation here is indicated by } \mu < v. \text{ This is somewhat in contrast to Kaldor (1956) where stability is directly related to the level of inequality.} \]
the most efficient manner. If 'µ' is very small or 'v' is very large then the economy will move to a stable growth rate but will be below the optimal level (permanent slump) under-utilising its saving.

When the degree of separation is low then any shock to the system is immediately felt in the output while the impact is much slower when degree of separation is high. In the latter instance, positive productivity shocks take time to impact on the output. Even though Aghion et al (1999) claim to be working in a Keynesian framework, they really are in a neo-classical framework wherein saving seems to be linked neither to income nor interest rates. The only aspect of Keynes in their framework is the separation of savers and investors as economic agents. It is obvious that they do not abide by the Keynesian tenet that investment generates its own savings. The excess of savings (even during periods of slump) violate the basic insights of Keynes. Further they do not allow for the asset market to operate with both flows and stocks. Only flows (money) is permitted as a financial asset which fundamentally limits the manoeuvrability of the model. There are important policy conclusions that emerge.

This model provides for counter-cyclical policy interventions in the economy. During slump when there are excess savings which is in search of investors, these could be picked up by the government at low rates of interest to boost investment, provide tax cuts or subsidies to business. This would boost the profits of investors and increase their investment potential and create conditions for increase in growth. Aghion et al (1999) probably thus come close to Kalecki's interpretation of budget
deficits. Kalecki as we have discussed elsewhere in this essay argued that budget
deficits are a consequence of capital's need to seek external markets to enhance
profitability. For the capitalists the budget deficit is equivalent to an export surplus
on the current account as it allows this class to increase its claims on the rest of the
world (anything beyond the realm of private domestic market including the
domestic government). Further, the notion of what constitutes acceptable or
sustainable levels of deficit and inflation is subjective and no clear criteria exist.
But this is something we turn to in the next Chapter where we examine the criteria
that have been discussed in the literature.