Public Investment Reversals, Inequality, and Borrowing: Fiscal Policy in India

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1

Abstract : With economic growth as a priority goal of the state it is a puzzle as to why public investment declined since the mid 1990s despite no significant reduction in fiscal deficits. This paper advances the proposition that public investment affects the returns to the distribution of factor endowments differentially. The rise in inequality then turns the attention of the state towards redistribution. Even when expenditures are financed by borrowing rather than taxation, increased inequality that creates pressures for redistributive transfers crowds out public investment. Future income generation gets adversely affected by a reversal of public investment which makes creditors impose borrowing constraints on the state. This can take the form of the enactment of fiscal responsibility legislation.

JEL Classification No. : O15, E62, E65, H62

Introduction:

India's fiscal deficit has deteriorated since the mid 1990s and now ranks amongst the worst in the world (Kochhar, 2006)[1]. Amongst emerging markets, only Turkey and Argentina have larger fiscal deficit to GDP ratios. The large fiscal deficit has been a persistent feature of the macro economy. Even though the balance of payments crisis of 1991 did result in the initiation of some fiscal restraint this was reversed in the mid 1990s. The deficit reduction reversed in part due to the low buoyancy of tax revenues as the tax system is narrowly based on indirect taxes and manufacturing and a few services, and customs revenues declined as trade has been liberalized (Rao, 2005)[2]. The deterioration in revenues was also accompanied by expenditure pressure after 1996-97 due to the substantial increase in the government pay and pension bill associated with the recommendation of the Fifth Pay Commission (Acharya, 2002)[3]. However, even as early as 1994, the Indian government decided not to accept further IMF loans as it sought to increase current social expenditures (e.g. cheap power to farmers and households) to

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[1]Kochhar, K. (2006) "India: Macroeconomic Implications of the Fiscal Imbalances", in Peter S. Heller & M. Govinda Rao (eds.) – "A Sustainable Fiscal Policy for India – An International Perspective", Oxford University Press, 44-75.

[2] Rao, M. Govinda (2005) – "Tax system reform in India: Achievements and Challenges Ahead", Journal of Asian Economics, 16. 993-1011.

[3] Acharya, S. (2002)- "Macroeconomic Management in the Nineties", Economic & Political Weekly, April 20, 1515 – 1538.

politically consequential groups (Kohli, 2006, p.1363)[4] . Finally, expenditures surged on account of a rise in interest payments as financial repression was reduced and government borrowings took place at market rates of interest[5](Acharya, 2002).

The rise in fiscal deficits has given rise to concern about its macroeconomic impact and its sustainability (Lahiri and Kannan, 2004)[6]. Fiscal consolidation has become a salient policy objective and is sought to be achieved in India via the Fiscal Responsibility and Budget Management Act which became effective from July 2004. This Act specifies annual targets for fiscal correction and seeks to reduce the fiscal deficit to 3 per cent of GDP by March, 2008. A Task Force was also set up for drawing up the medium term framework for fiscal policies so as to achieve the targets as specified in the Act. With an adjustment path spelt out there is concern about whether the burden of adjustment will fall on public investment and other important items of expenditure such as operations and maintenance expenditures.

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[4] Kohli, A. (2006)- "Politics of Economic Growth in India, 1980-2005, Part II: The 1990s and Beyond", Economic & Political Weekly, April 8, 1361-1370.

[5] Prior to 1991 government borrowing was accommodated through hikes in the statutory liquidity ratio (SLR) that was imposed on commercial banks. This enabled the placement of government securities at sub-market rates. By 1990 SLR was 39 per cent of bank assets.

[6] Lahiri, A. and R. Kannan (2004) – "India's Fiscal Deficits and their Sustainability in Perspective", in E.M. Fervaro & A.K. Lahiri (eds.) - "Fiscal Policies and Sustainable Growth in India", Oxford University Press, 23-59.

Given the pressure on current expenditures deficits have been reduced mainly by cutting public investment and especially social and physical infrastructure spending. As a decline in public investment constrains growth there have been concerns raised about the need to step up this component of expenditure (Ahluwalia, 2002[7]; Kochhar, 2006; Lahiri and Kannan, 2004). In fact, Kohli (2006) argues that the decline of public investment (and the buoyancy of private investment) is a "key element of India's economic growth 'story' in the 1990s".

Figure I: Public Investment and Fiscal Deficits in India

Source: RBI, Handbook of Statistics on the Indian Economy
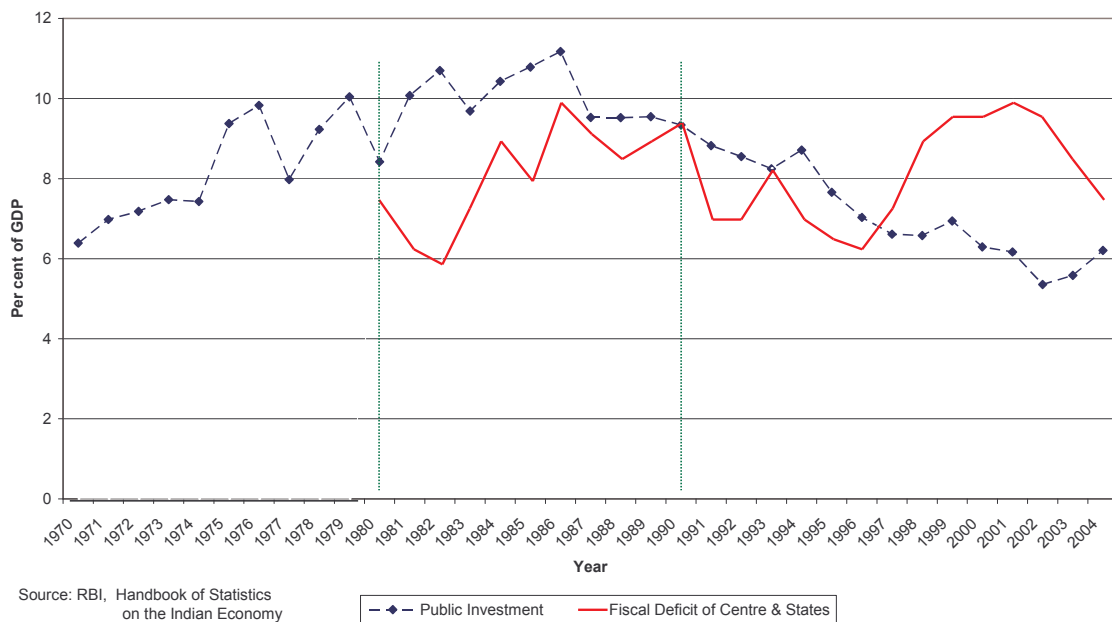
A significant feature of the pre-crisis 1980s is the growth in public investment that fueled the economic growth of that period. The 1990s and beyond by contrast has been associated with declining public

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[7] Ahluwalia, M.S. (2002) – "Economic Reforms in India since 1991: Has Gradualism Worked?", Journal of Economic Perspectives, 16(3), Summer, 67-88.

investment (see Figure I). The decline in public investment at a time when more expenditures are required on power, water, and rural infrastructure, is growth constraining to the extent that public investment is known to crowd in private investment in India (Serven, 1996; Murty and Soumya, 2006)[8]. Given that economic growth is a priority goal of the state (Kohli, 2006) this is a puzzle. The standard explanation which is an event driven one has been that the high levels of debt incurred in the 1980s and the subsequent balance of payments crisis of 1991 shifted the focus of fiscal policy towards the low level of government savings and resulted in the initiation of a fiscal restructuring and compression of public expenditures. As the cash flow stream associated with public investment in infrastructure is such that high costs are incurred in the present and the returns though high, accrue over the long run, postponing lumpy and costly public investment spending is far easier for a government than cutting current expenditures. Expenditure compression is therefore linked to investment expenditure cuts.

It is often argued that policy changes, stops, and reversals tend to be episodic. They are often triggered by discrete changes or shocks such as banking and balance of payments crises, changes in government,

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[8] Serven, L. (1996) – " Does Public Capital Crowd Out Private Capital? – Evidence from India", Policy Research Working Paper 1613, The World Bank.
Murty, K.N. and A. Soumya (2006) – "Macroeconomic effects of public investment in infrastructure in India", IGIDR, Working Paper 2006-003, Mumbai.

changes in global interest rates, and even leverage exercised by international financial institutions (Krueger, 1993)[9]. The event driven explanation has merit in ex post identifying the exact timing of a policy change. However, it does not interpret a policy change as part of a process – an event may be part of a larger process and identifying the structure of a process can offer an altogether different understanding of policy changes. The event or shock may then be a factor that hastens or hinders a policy change that would nevertheless have eventually occurred if the underlying economic processes had unfolded undisturbed. Our focus in this paper is on identifying the process behind public investment reversals in India.

In contrast to the event driven explanation the view that we put forward in this paper is that the distributive consequences of public investment spending are behind both the rising public investment of the 1980s and the decline in the 1990s and beyond. Though public investment raises the productivity of private factor endowments, those with higher factor endowments benefit more from an increase in public investment than those with lower factor endowments. The wealth creating assets that households are endowed with unequally are various forms of capital - physical capital, financial capital, and human capital.

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[9] Krueger, A.O. (1993) – "Political economy of policy reform in developing countries", Cambridge MA, MIT Press.

Physical capital encompasses land, housing, livestock, implements and other production durables that constitute tangible assets which allow production and that have the potential of begetting income. Financial assets constitute assets with higher liquidity and lower carrying costs that allow households to make intertemporal adjustments of income that can be used for consumption, production, and investment[10]. Human capital includes health, education, and nutrition that are embodied in individuals and which translate into skills and abilities that are potential sources of labour, managerial and entrepreneurial incomes. Households have endowments of the various forms of capital identified at their disposal - their opportunities - which can be transformed into different forms of income that can be thought of as returns to these types of capital. In what follows we do not distinguish between these various forms of endowments and refer to the capital endowment quantity in the aggregate. Public investment as we demonstrate increases the returns to private capital endowments differentially and raises its productivity.

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[10] There are three types of financial capital services that it is useful to distinguish. Savings services allow the depositing and accumulation of small amounts of capital over time which in many cases earn a positive rate of return. Credit services allow a borrower to obtain a lump sum now but repayments of the principal and interest have to be made at some future point of time. Insurance services allow clients to pay a premium in return for a future payout that is contingent on the occurrence of a risk whose timing is unknown. See D'Souza (2001) – "Secure Livelihoods", Indian Journal of Labour Economics, 45(4).

By disproportionately benefiting those with higher factor endowments public investment creates an incentive for such individuals to influence the government's expenditure policy. This influence effect increases public investment expenditure but at the same time since those with large factor endowments benefit more, inequality increases. The rise in inequality makes redistribution more attractive to the median voter and a government attentive to such preferences reallocates expenditures towards transfers and away from public investment. Public investment expenditure then declines when inequality has risen sufficiently.

Increases in public investment in the 1980s according to our view were accompanied by an increase in influence expenditures by those who were seeking to affect a policy variable – public investment – that impacted favourably on their incomes. However, a continued increase in such influence expenditure by raising inequality sufficiently eventually reduces the significance of this influence seeking group in state expenditure policy. The state still has the objective of promoting growth and turns towards global integration with the world economy and the market to achieve this. Tax rates were accordingly moderated and the tax administration sought to be modernized. As tax rates were reduced the tax-GDP ratio declined. Public expenditures increasingly were required to

be financed by borrowings and were accompanied by a rise in the fiscal deficit.

However, these borrowings were deployed towards transfer expenditures and redistribution in response to rising inequality. This reduced the emphasis of public expenditure policy on public investment which is tantamount to signaling a reduction in potential growth. Lenders who witness the atrophying tax revenues and the constraints on economic growth associated with the increased emphasis of public expenditures on transfers would then have an incentive to impose a ceiling on borrowing by the government as a way of securing their returns. Inequality and the composition of public expenditures are accordingly the important underpinnings to the passage of a fiscal responsibility act which constrains the growth of government expenditure. For us transfer expenditure is a generic expression that includes not just those expenditures classified as transfers in an economic classification of government budgets but also implicit transfers[11]. Implicit transfers include for example the rent component of public sector wages. With income inclusive of the rent component in the public sector exceeding the alternative income in the private sector (and of course the alternative income if unemployed), the income is often not

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[11] Transfer expenditures do not get reported in the national accounts and there is no estimate of this item of expenditure at the level of the states in India.

in synchrony with labour productivity. Public spending on wages of unproductive and surplus employees is akin to a transfer rather than government consumption expenditure. The Fifth Pay Commission of India recommendation of a 30 per cent staff cut in government which did not get implemented is indicative of the extent of implicit transfers in the salaries expenditures of the government. Similarly, not charging user fees on many public utilities such as electricity, water, etc., is a substantial form of transfer that does not necessarily get reported as an explicit subsidy or transfer payment in the accounts of the government. Directed credit programmes stipulating how much of a banks' portfolio goes into lending say to agriculture, also constitute a form of implicit transfers.

In the next section we show how an unequal distribution of factor endowments creates an incentive to support public expenditures that are investment expenditures or transfer expenditures. We show how inequality increases from the pursuit of influence activities that induce government to orient its expenditure policy towards investment expenditure. In the following section we show that increased inequality results endogenously in a greater emphasis on transfers over investment expenditures and the imposition of borrowing limits (fiscal management) on the government. We then conclude.

Section 1:Public Investment and Factor Endowments

In order to produce an output, Y, two factors of production are taken to be required – capital, K, which is privately owned, and public capital, G. As we wish to focus on public capital and investment we take the supply of private capital to be inelastic and the supply of public capital is decided by the government. Public capital is a public intermediate good that increases private sector productivity by providing complementary public inputs[12] (Baldacci, Hillman, & Kojo, 2004)[13].

The production function which is constant returns to scale with respect to the private sector endowment, K, is –

$$Y = F(K,G) \qquad F_i > 0, F_{ii} < 0, F_{ij} > 0$$

$$i, j = K, G \qquad\qquad\qquad ---(1)$$

The individuals in the economy belong to either one of two groups – the capital-abundant group, with aggregate capital endowment, K_a, or, the capital-poor group, with an aggregate capital endowment, K_p. $K_\alpha + K_\rho = K$, the aggregate constant factor endowment in the economy.

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[12] An example is when spending on rural roads facilitates trade in rural areas.
[13] Baldacci. E., A.L. Hillman, and N.C. Kojo (2004) – "Growth, governance, and fiscal policy transmission channels in low-income countries", European Journal of Political Economy, 20, 517-549.

With δ_a and δ_ρ denoting the number of individuals in the capital abundant and capital poor group, respectively, we have,

$$\left.\begin{array}{l} \delta_a \overline{K}_a = K_a \\ \delta_p \overline{K}_p = K_p \end{array}\right\} \quad \text{---(2)}$$

where, $\overline{K}_a$ is the mean or average endowment of capital per person in the capital abundant group, and similarly, $\overline{K}_p$ is the average endowment of capital per person in the capital poor group. Clearly, $\overline{K}_a > \overline{K}_p$. Without loss of generality we assume perfect competition to prevail and take the output price as the numeraire. Then, the gross income of individual j is

$$Y_j^g = K_j F_K \qquad \text{---(3)}$$

where,

        F_K: marginal productivity of capital,

        K_j: capital endowment of individual j.

An increase in expenditure on public capital results in a rise in the marginal productivity of capital ($F_{KG} > 0$ from (1)), and raises the gross income of an individual. However, the expenditure on public capital has

to be financed and this requires the levy of a tax which we take to be a proportional tax on income, the tax rate being t $(0 < t < 1)$. The government spends on public capital as well as redistributes incomes. The lump-sum redistribution to each person is R so that the government budget constraint is given by[14]

$$G + R\delta = t\left(\delta_a \bar{Y}_a^g + \delta_p \bar{Y}_p^g\right) \qquad \text{---(4)}$$

Transfers increase individual incomes whereas taxes reduce them. The income of individual j may now be written as

$$Y_j = \left[K_j F_K\right](1-t) + R \qquad \text{---(5)}$$

From the properties of the production function, we may write the expression for $K_j F_K$ as follows[*] -

$$K_j F_K = \frac{F}{\delta} + \left(K_j - \bar{K}\right)F_K$$

where, $\bar{K} = \dfrac{K}{\delta} = \dfrac{K_a + K_\rho}{\delta_a + \delta_\rho}$ is the average factor endowment per person.

The income of the individual then is

$$Y_j = \left\{ \frac{F}{\delta} + \left(K_j - \overline{K} \right) F_K \right\} (1 - t) + R \qquad \text{---(6)}$$

Replacing R from the government budget constraint (4),

$$Y_j = \left\{ \frac{F}{\delta} + \left(K_j - \overline{K} \right) F_K \right\} (1 - t) + t \frac{\delta_a \overline{Y}_a^g + \delta_p \overline{Y}_p^g}{\delta} - \frac{G}{\delta}$$

This allows us to rewrite (6) as⁴ -

$$Y_j = \frac{F}{\delta} + \left(K_j - \overline{K} \right) F_K (1 - t) - \frac{G}{\delta} \qquad \text{---(7)}$$

We can then write the response of income of individual j to a rise in public capital expenditure as

$$\frac{\partial Y_j}{\partial G} = \frac{F_G}{\delta} + \left(K_j - \overline{K} \right) F_{KG} (1 - t) - \frac{1}{\delta} \qquad \text{---(8)}$$

This gives us our first proposition -

Proposition I: An increase in public capital expenditure increases the income of a capital abundant individual more than an individual who has a capital poor endowment.

Hence, capital abundant individuals prefer a higher level of public capital expenditure than a capital poor individual. Thus we have contending citizen preferences for the appropriate level of public capital expenditure by the government. This provides incentives for individuals to expend resources on influencing the expenditure policies of the government. Influence activities can be pure lobbying to rent seeking to even expenditure on graft. We are neutral to the interpretation that may be given to influence seeking. For our purposes the differential returns to capital endowments creates incentives for individuals to influence the composition of public expenditure. The government responds to this influence activity and chooses its level of public expenditure. Then, the government is interested in the following welfare function

$$W = \beta \overline{Y}_a + (1 - \beta) \overline{Y}_p \qquad \text{---(9)}$$

where, β is the relative welfare weight attached by the government to the group of individuals with capital abundant factor endowments♥.

Substituting (7) into (9),

$$W = \beta \left\{ \frac{F}{\delta} + (\overline{K}_a - \overline{K})F_K(1-t) - \frac{G}{\delta} \right\} + (1-\beta) \left\{ \frac{F}{\delta} + (\overline{K}_p - \overline{K})F_K(1-t) - \frac{G}{\delta} \right\}$$

Then, the following is the first order condition for optimal[♠] public capital expenditure by the government

$$\frac{\partial W}{\partial G} = \frac{F_G}{\delta} + F_{KG}(1-t)\{\beta(\overline{K}_a - \overline{K}_p) + (\overline{K}_p - \overline{K})\} - \frac{1}{\delta} = 0 \qquad \text{---(10)}$$

Substituting the optimal public capital expenditure expression as given in (10) into (8) gives us the effect of public capital on the incomes of the capital abundant and capital poor group of individuals –

$$\left.\begin{aligned}
\frac{\partial \overline{Y}_a}{\partial G} &= F_{KG}(1-t)(1-\beta)(\overline{K}_a - \overline{K}_p) > 0 \\
\frac{\partial \overline{Y}_p}{\partial G} &= -F_{KG}(1-t)\beta(\overline{K}_a - \overline{K}_p) < 0
\end{aligned}\right\} \qquad \text{---(11)}$$

This confirms that given a relative welfare weight, β, individuals with a capital abundant factor endowment benefit from a marginal increase in public capital expenditure whereas individuals with a capital poor factor endowment would prefer a reduction of public capital expenditures. Comparative statics from (10) depicts that the optimal public capital expenditure by government increases with the relative weight attached to the individuals with capital abundant factor endowments –

$$\frac{\partial G}{\partial \beta} = -\frac{F_{KG}(1-t)(\overline{K}_a - \overline{K}_p)}{W_{GG}} > 0 \qquad\qquad \text{---(12)}$$

This prompts the question as to how the relative weights in the government's welfare function are decided. As argued earlier individuals spend resources on influence activities in order to affect government expenditure policies. The absolute weight that government attaches to an influence group is therefore an increasing function of the influence-seeking expenditures I_j of influence group j. Define the elasticity of the weight the policy maker gives to an influence group as a result of influence-seeking expenditures as

$$\varepsilon_j = \frac{\partial \beta_j / \beta_j}{\partial I_j / I_j} = \frac{\partial \beta_j}{\partial I_j} \frac{I_j}{\beta_j} > 0$$

Then, the effect of influence seeking on the relative welfare weight β is

$$\left. \begin{aligned} \frac{\partial \beta}{\partial I_a} &= \frac{(1-\beta)\beta\varepsilon_a}{I_a} > 0 \\ \frac{\partial \beta}{\partial I_p} &= -\frac{\beta(1-\beta)\varepsilon_p}{I_p} < 0 \end{aligned} \right\} \qquad \text{---(13)}$$

Hence, the capital abundant individuals can as a result of an increase in influence seeking expenditures raise their relative weight in the government's objective function and thereby [see (12)] bring about an increase in the public capital expenditure by the government. Of course, the capital poor individuals can resist this by increasing their expenditure on influence seeking with the government.

For completeness, the influence-seeking groups of individuals who belong to either a capital abundant or capital-poor group maximize their collective income net of expenditures on influencing government policy. Hence, they select influence-seeking expenditures on the basis of the following –

$$\underset{\{I_j\}}{\text{Max}} \quad \delta_j \bar{Y}_j - I_j$$

This gives, $\qquad \dfrac{\partial \bar{Y}_j}{\partial G} \dfrac{\partial G}{\partial \beta} \dfrac{\partial \beta}{\partial I_j} = \dfrac{1}{\delta_j}$ $\qquad$ ---(14)

We can substitute (11), (12), and (13) into the above equation (14) and solve for the equilibrium influence-seeking expenditures. That gives us the weight and influence that sets the government's composition of

public expenditures. Finally, the composition of public expenditure affects the income of the individual depending on his factor endowment. We obtain,

$$I_a* = -\frac{\delta_a \left\{ F_{KG}(1-t)\left(\overline{K}_a - \overline{K}_p\right)(1-\beta)\right\}^2 \beta\varepsilon_a}{W_{GG}} \qquad \text{--- (15)}$$

and

$$I_p* = -\frac{\delta_p \left\{ F_{KG}(1-t)\beta\left(\overline{K}_a - \overline{K}_p\right)\right\}^2 (1-\beta)\varepsilon_p}{W_{GG}} \qquad \text{---(16)}$$

Proposition II: As would be expected the influence expenditure of a group of individuals is higher,

(1) the larger the size of the group, δ,

(2) the larger is the responsiveness of the government in terms of the weight given to the interests of a group as a result of influence activities undertaken by the group, β,

(3) the larger is the difference in average capital endowment between the abundantly endowed and the poorly endowed group, $\left(\overline{K}_a - \overline{K}_p\right)$ and,

(4) the larger is the impact of public capital on factor productivity (F_{KG}).

Thus, even when the size of a group seeking to influence the government is small, it has an incentive to expend resources on influence activities when its factor endowment is significantly different from the factor endowment of the group seeking a contrarian outcome and when its influence activity is effective in that it causes the government to increase the relative weight given to the group in its choice of expenditure policy.

Section 2: Influence Effects and Inequality in India

We are silent about the processes that resulted in the salience of capital abundant influence seeking groups in the decision making by government. This interesting issue is beyond the scope of this paper. Kohli (2006a)[15] argues that the 1980s in India witnessed a new model of development –

"Indira Gandhi shifted India's political economy around 1980 in the direction of a state and business alliance for economic growth. This change was not heralded loudly and has often been missed by scholars …. she downplayed redistributive concerns and prioritized economic growth; sought an alliance with big business; adopted an anti-labour

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[15] Kohli, A. (2006a) – "Politics of Economic Growth in India, 1980-2005. Part I: The 1980s", Economic & Political Weekly, April 1, 1251-1259.

stance; put brakes on the growth of public sector industries; and demoted the significance of economic planning and of the Planning Commission" (Kohli, 2006a, p.1255).

As Kohli notes the government commitment to growth was reflected in the high levels of public investment in 1980s which eased infrastructural bottlenecks and boosted overall demand. Then why did public investment decline in the 1990s? Even though deficits did decline initially they climbed back up from 1996 onwards towards the level at the beginning of the 1990s. And yet public capital expenditure declined. Kohli argues that one part of the explanation is due to the fragmented nature of state power which by giving tax concessions to the rich and middle class, made it difficult to raise taxes and revenues. Meanwhile another part of the explanation is that cuts in social expenditures were seen as costly to popular electoral support. So why did redistribution and transfer expenditures which attract political support suddenly become important in the 1990s?

Our take on this is that the increased public investment of the 1980s by raising the productivity of those with abundant factor endowments more than that of those with poorer endowments raised inequality in the economy. The evidence on rising inequality during the

liberalization period is unequivocal. Mahendra Dev and Ravi (2007)[16] find that inequality in consumption as measured by Gini coefficients has increased significantly for both rural and urban areas from 1983 to 2004-05, with the rate of increase being higher for urban as compared to rural areas[17]. Deaton and Dreze (2002)[18] sum up their findings as follows –

"We find strong indications of a pervasive increase in economic inequality in the nineties. This is a new development in the Indian economy: until 1993-94, the all-India Gini Coefficients of per capita consumer expenditure in rural and urban areas were fairly stable. Further, it is worth noting that the rate of increase of economic inequality in the nineties is far from negligible".

Banerjee and Piketty (2003)[19]also report that the shares of the top 0.01 per cent, the top 0.1 per cent and the top 1 per cent in total income shrank from 1956 until the mid 1980s and then went back up again indicating a U-shaped pattern and that the rich were definitely getting richer with the evolution of liberalization in the Indian economy.

[16] Mahendra Dev, S and C. Ravi (2007) – "Poverty and Inequality: All-India and States, 1983-2005", Economic & Political Weekly, February 10, 509-521.
[17] See the graph in Appendix I.
[18] Deaton, A. and J. Dreze (2002) – "Poverty and Inequality in India – A Re-Examination", Economic & Political Weekly, September 7, 3729-3748.
[19] Banerjee, A. and T. Piketty (2003) – "Top Indian Incomes, 1956-2000", MIT, Department of Economics, Working Paper 03-32.

The rise in inequality is associated with an increase in the skewness of the distribution of income. The increased concentration of income at the top makes redistribution more attractive for the median voter rather than public capital expenditure. This is the direct result we obtained as Proposition I where a rise in inequality (interpreted standardly as a decline in median income relative to mean income) increases the preference of the median income voter towards transfers and redistributive expenditures and away from public capital expenditure. As inequality increases the government becomes more attentive to increasingly distressed median voter preferences that are decisive in electoral outcomes. Such governments reallocate public expenditure towards transfers and away from public investment.

At the same time with the opening up of the economy the government committed itself to lowering marginal tax rates and simplifying the tax structure whilst seeking to increase compliance by better administration and enforcement. Integrating into the world economy for instance required bringing down the peak tariff rates from over 400 in 1990-91 to 50 per cent by 1995-96 and 20 per cent on non-agricultural goods by 2004-05. As a result customs revenues which were 3.6 per cent of GDP in 1985-86 reduced to 1.5 per cent of GDP by 2005-06 (Rao, 2005). This reduction in customs revenues was not

compensated for by the rise in direct and other taxes so that the tax-GDP ratios have declined since 1990-91 (Rajaraman, 2006)[20]. Services which are relatively more income elastic began to be taxed at the central level only in 1994-95 with a list of three services and the list has been slowly expanded to include approximately 80 services at present. The reduction in tax-GDP ratios and the pressure on expenditure caused the government to borrow and deficits began to increase from 1996-97 onwards.

The rise in fiscal deficits and transfer expenditures by the government were contemporaneous. After years of discussion the Fiscal Responsibility and Budget Management (FRBM) Act was passed in 2004 which specified annual targets for the reduction of the deficit along with a reduction in debt liabilities. This limits the expenditure that government can incur and raises the question as to whether the result that increased inequality results in a reduction in capital expenditures by a government sensitive to median voter preferences holds when financing of those expenditures is on the basis of borrowing rather than taxes as demonstrated in Section 1. A related question is whether a rise in inequality results in voter preferences for limiting the borrowing capacity of government as occurs when a fiscal responsibility legislation

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[20] Rajaraman, I. (2006) – "Fiscal Developments and Outlook in India", in Peter S. Heller & M. Govinda Rao (eds.) – "A Sustainable Fiscal Policy for India – An International Perspective", Oxford University Press, 8-43.

is introduced. We turn to examining these two questions in the next section.

Section 3: Borrowing and Public Expenditures

As borrowing implies repayments, at the very least, we require a two period model. Here we consider any agent with utility over consumption (C_i) in the two periods $(i = 1,2)$.

$$U = u(C_1) + \theta u(C_2)$$
$$= \log C_1 + \theta \log C_2 \qquad \text{---(17)}$$

where, θ is the impatience for period 2 consumption. On date 1 the individual receives an endowment Y_1, but no capital is inherited from the past. The individual also receives a redistributive transfer that is lump-sum, R. The agent decides how much to consume (C_1) and how much to save and invest (K_1). The first period budget constraint then is[21]

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[21] Note that output can only be produced if there is complementary public capital expenditure as $F(K_1, 0) = 0$ in (19). Hence, we presume that creditor behaviour is separable from tax behaviour and a part of the received endowment in period 1 is lent to the government to enable complementary public expenditure. Otherwise with borrowings repaid by tax financing and the government budget inter-temporally balanced we would obtain Ricardian consequences.

$$C_1 = Y_1 + R - K_1 \qquad\qquad \text{---(18)}$$

The amount invested in the first period along with public investment G produces an output in the second period given by[22]

$$Y_2 = F(K_1, G)$$

$$= \alpha K_1 G \qquad\qquad \text{---(19)}$$

Consumption in the second period, then, is that output left over after repayments ($\mathfrak{R}$) are made for the borrowings made by the government to finance its expenditures.

$$C_2 = Y_2 - \mathfrak{R} \qquad\qquad \text{---(20)}$$

The government borrows an amount D (for debt) and allocates this between redistributive transfers and public capital expenditures

$$D = R + G \qquad\qquad \text{---(21)}$$

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[22] Obstfeld, M. and K. Rogoff (1997) – "Foundations of International Macroeconomics", The MIT Press. We follow Obstfeld and Rogoff (1997, p.382) who assume that the marginal product of capital is approximately constant over the small scale on which the country can invest.

The government may not repay the sum of interest and principal $(1+r)D$ in full. In case it defaults, then, creditors get only a fraction (η) of second period output due to enforcement and collection costs as the institutions of investment are weak (Gertler and Rogoff, 1990)[23].

$$\mathfrak{R} = \min\{(1+r)D, \eta Y_2\} \qquad \text{--- (22)}$$

The repayment on debt by the government is financed by taxing individuals at a proportionate rate t in order to cover the repayments. Thus, with $tY_2 = \mathfrak{R}$, second period consumption may be written as

$$C_2 = (1-t)Y_2 \qquad \text{---(23)}$$

Having borrowed the government is free to choose what it wants to do with the money borrowed. It could just redistribute the money or spend it on public capital formation that raises date 2 output. Creditors are thus prompted to ask themselves the question that if they lend in period 1, will the government choose to invest enough to make $\eta Y_2 \geq (1+r)D$. If the government does not invest enough creditors won't be repaid in full. Thus, creditors would be interested in fathoming how much they should safely lend.

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[23] Gertler, M. and K. Rogoff (1990) – "North-South Landing and Endogenous Capital Market Inefficiencies", Journal of Monetary Economics, 26, 245-66.

Public capital expenditures are significant in that they raise second period output and make it more likely that borrowings will be repaid. However, the government is unable to credibly commit to the composition of public expenditures before it borrows. We thus first consider the case of an individual who takes as parametric the composition of public expenditure and the tax rate and chooses consumption (C_1, C_2) and private capital formation (K_1). The second period constraint is

$$C_2 = (1-t)Y_2 = (1-t)\alpha K_1 G$$

or, $\quad \dfrac{C_2}{(1-t)\alpha G} = K_1$

Add the first period constraint

$$C_1 = Y_1 + R - K_1$$

to the second period constraint to obtain the intertemporal budget constraint

$$C_1 + \frac{C_2}{(1-t)\alpha G} = Y_1 + R \qquad\qquad \text{---(24)}$$

Maximizing (17) subject to (24) gives

$$C_1 = \frac{1}{1+\theta}(Y_1 + R) \qquad\qquad ---(25)$$

$$C_2 = (1-t)\alpha G \frac{\theta}{1+\theta}(Y_1 + R) \qquad\qquad ---(26)$$

$$K_1 = \frac{\theta}{1+\theta}(Y_1 + R) \qquad\qquad ---(27)$$

Substituting (25) and (26) into (17) gives the maximized lifetime utility of an individual as

$$U = \log\frac{1}{1+\theta}(Y_1 + R) + \theta\log(1-t)\alpha G \frac{\theta}{1+\theta}(Y_1 + R)$$

or, $U = \theta\log(1-t)\alpha G + \log\frac{\theta^\theta}{(1+\theta)^{\theta+1}} + (1+\theta)\log(Y_1 + R) \qquad ---(28)$

The preferences of an individual for the composition of public expenditures will depend on whether the government repays the borrowing or defaults. Let us first take the case of default. Then, the tax rate in the second period equals the fraction of second period output that

creditors will be able to recover, i.e., $t = \eta$. Then, lifetime utility under the condition of non repayment (N) will be

$$U^N = \theta \log(1 - \eta)\alpha(D - R) + \log \frac{\theta^\theta}{(1 + \theta)^{1+\theta}} + (1 + \theta)\log(Y_1 + R)$$

---(29)

where we have used the government budget constraint to replace G in the first term.

We can find the preference for transfers by the individual as

$$\frac{\partial U^N}{\partial R} = -\frac{\theta}{D - R} + \frac{1 + \theta}{Y_1 + R} = 0 \qquad \text{---(30)}$$

The level of redistributive transfers that an individual would prefer under default then is

$$R^N = \frac{(1 + \theta)D - \theta Y_1}{1 + 2\theta} \qquad \text{---(31)}$$

An individual would therefore prefer a level of transfers that is increasing with the debt and decreasing with income if non-repayment is to occur.

We now turn to the case of repayment (P) of the borrowing. Then, from the second period optimal consumption plan (26) it must be the case that

$$t\alpha G\frac{\theta}{1+\theta}(Y_1+R)=(1+r)D$$

or, $$t=\frac{(1+r)D}{\alpha G\dfrac{\theta}{1+\theta}(Y_1+R)}$$ ---(32)

Maximized lifetime utility in the case of repayment will then be

$$U^P=\theta\log(1-t)\alpha(D-R)+\log\frac{\theta^\theta}{(1+\theta)^{1+\theta}}+(1+\theta)\log(Y_1+R)$$

---(33)

where, t is given by (32).

Hence, the redistributive transfers preferred by an individual when there is repayment would be

$$\frac{\partial U^P}{\partial R}=-\frac{\theta}{D-R}-\frac{\theta}{1-t}t_R+\frac{1+\theta}{Y_1+R}=0$$ ---(34)

Comparing (30) and (34), $\dfrac{\partial U^P}{\partial R} < \dfrac{\partial U^N}{\partial R}$ provided $t_R > 0$. Thus, we have,

Proposition III : The level of redistributive transfers preferred by an individual in the instance where the government does not repay (case N) is greater than when there is repayment (case P).

This is what our hunch would be as well. If there is going to be repayment in the second period then given a fixed outgo of $(1+r)D$ it makes sense to ensure that second period income is as far above this fixed outgo as possible. That would occur if complementary public capital spending which increases second period income was increased and redistributive transfers lowered. On the other hand, if there is going to be non-repayment in the second period, then, as a fraction η of second period income would be lost to creditors, it is advantageous to reduce this outgo by reducing second-period income. A reduction in public capital expenditure achieves this purpose and diverts borrowings to redistributive transfers that increase income in the first period. Hence, an agent would prefer higher redistributive transfer expenditures when non repayment by government is to occur than when repayment will transpire in the second period.

Now, if the individual concerned is the person with median income who is decisive in swaying policy makers as we are presuming, then, an increase in inequality as represented by a decline in median income relative to the mean will result in policy makers making larger redistributive transfers and investing less of the resources borrowed. This is obvious when we rewrite U^P from (33) as

$$U^P = \theta \log(1-t)\alpha(D-R) + \log \frac{\theta^\theta}{(1+\theta)^{1+\theta}} + (1+\theta)\log(\bar{Y}+G)$$

$$+ (1+\theta)\left[\log(Y^m + G) - \log(\bar{Y}+G)\right]$$

where, $\bar{Y}$ is the mean income and Y^m the median income. The first part is the maximized lifetime utility of the individual with mean income which we write in short as $U^P(\bar{Y})$. The second part with the term $\log(Y^m + G)/(\bar{Y}+G)$ in square brackets is the log difference of median from mean income. Then,

$$\frac{\partial U^P}{\partial R} = \frac{\partial U^P(\bar{Y})}{\partial R} + \frac{(1+\theta)(\bar{Y}-Y^m)}{(\bar{Y}+G)(Y^m+G)} \qquad\qquad \text{---(35)}$$

Thus, an increase in inequality as measured by an increase $(\bar{Y}-Y^m)$ will result in larger redistributive transfers in the situation where the

government repays. As a result if we set $Y_1 = Y^m$ in (31), transfers will also rise in the case of non-repayment.

That transfers rise with inequality implies that second period income will be lower than otherwise. This raises an issue in creditors minds as to what are the safe limits to lending. It is safe to lend as long as the amount of public capital expenditure results in second period output that covers the cost of repayment in case of default, i.e., as long as $\eta Y_2 \geq (1+r)D$. Thus, it is safe to extend credit as long as $U^N - U^P = 0$, where, to recall,

$$U^N = \theta \log(1-\eta)\alpha G^N + \log \frac{\theta^\theta}{(1+\theta)^{1+\theta}} + (1+\theta)\log(Y_1 + R^N)$$

Similarly,

$$U^P = \theta \log \alpha G^P + \theta \log\left[1 - \frac{(1+r)D}{\alpha G^P \dfrac{\theta}{1+\theta}(Y_1 + R^P)}\right] + \log \frac{\theta^\theta}{(1+\theta)^{1+\theta}}$$
$$+ (1+\theta)\log(Y_1 + R^P)$$

Then,

$U^N - U^P = 0$ is the expression given by -

$$0 = \theta \log \frac{(1-\eta)G^N}{G^P} - \theta \log \left[1 - \frac{(1+r)D}{\alpha G^P \left(\dfrac{\theta}{1+\theta} \right)(Y_1 + R^P)} \right] - (1+\theta)\log \frac{Y_1 + R^N}{Y_1 + R^P}$$

Exponentiating this equality,

$$1 = \left[\frac{(1-\eta)G^N}{G^P} \right]^{\theta} \left[1 - \frac{(1+r)D}{\alpha G^P \left(\dfrac{\theta}{1+\theta} \right)(Y_1 + R^P)} \right]^{-\theta} \left[\frac{Y_1 + R^N}{Y_1 + R^P} \right]^{-(1+\theta)}$$

Solving for D we obtain the limit beyond which creditors would be reluctant to extend credit as

$$\overline{D} = \frac{\alpha \left(\dfrac{\theta}{1+\theta} \right)(Y_1 + R^P) \left\{ G^P - (1-\eta)G^N \left(\dfrac{Y_1 + R^N}{Y_1 + R^P} \right)^{-\frac{1+\theta}{\theta}} \right\}}{1+r} > 0$$

---(36)

We thus see that creditors will not extend credit beyond $\overline{D}$ because that may require them to incur a penalty where they are not repaid the amount borrowed.

Amongst the terms in (36) that increase the limit of borrowing include –

(1) a greater fraction of second period output that creditors receive when default occurs – higher η

(2) the greater is the productivity of capital in the economy – higher α

(3) the lower is the interest rate – lower r

(4) the higher is the weight on second period consumption – higher θ

That there exists a debt ceiling implies that U^{N} is steeper than U^{P} so that when $D < \overline{D}$ the government repays and when $D > \overline{D}$ it does not repay the debt. What happens to the debt ceiling if inequality increases? We answer this question by inquiring as to what happens to U^{N} and U^{P} when median income increases without any alteration in mean income. In the equation for U^{N} let the income be that associated with the person of median income. Then, an increase in median income affects the maximized lifetime utility of the individual in the case where a choice has been made to not repay the borrowing as follows

$$\frac{\partial U^N}{\partial Y_1^m} = \frac{1+\theta}{Y_1^m + R^N} \qquad\qquad \text{---(37)}$$

Similarly, the increase in median income affects the maximized lifetime utility of the individual in the case where a choice has been made to repay the amount borrowed in the following way

$$\frac{\partial U^P}{\partial Y_1^m} = \frac{\theta(1+r)D}{\left[\alpha R^P\left(\dfrac{\theta}{1+\theta}\right)\left(Y_1^m + R^P\right) - (1+r)D\right]\left(Y_1^m + R^P\right)} + \frac{1+\theta}{Y_1^m + R^P}$$

$$\text{---(38)}$$

As $R^N > R^P$, it is clearly the case that

$$\frac{\partial U^N}{\partial Y_1^m} < \frac{\partial U^P}{\partial Y_1^m} \qquad\qquad \text{---(39)}$$

Proposition IV: An increase in inequality by increasing the utility of non-repayment relative to repayment results in the decrease of the amount that the government may borrow.

Thus as inequality increases (which we interpret as a decline in Y_1^m for a given mean income), the decrease in maximized lifetime utility is larger in the case of non-repayment than in the case of repayment. As a result the borrowing limit in (36) will be lower. This arises because as the distribution of income in the economy becomes more unequal there is pressure from the median citizen on policymakers to make more redistributive transfers. As a result the government spends less on public capital expenditures and this lowers second period output. The fraction of second period output that can be acquired by creditors in the event of default then decreases and this results in the response by creditors to reduce the amount which government may borrow. This is interpreted by us as an imposition of borrowing limits as for instance in a fiscal responsibility legislation. As the government is unable to commit to an increase in public capital expenditure prior to receiving funds from creditors, the creditors require the government budget constraint to be tightened so that the damage to future growth is contained.

Conclusion:

The rise in fiscal deficit and the decline in public investment are major constituents of the Indian economic growth story since 1990. As economic growth has been a priority objective for the state in India and

as public investment crowds in private investment this is a puzzle. The standard event driven explanation for this is that the increased fiscal deficits of the 1980s proved to be unsustainable and this required fiscal restructuring and a compression of public expenditures. As a result there was a pressure to introduce legislation to contain the deficit through the enactment of fiscal responsibility legislation. The long gestation period that accompanies public investment projects which generate returns over the longer run also makes it more appealing to contain expenditures by reducing public investment.

Our approach, however, provides an endogenous explanation for this puzzle. We argue that public investment affects individuals differentially – those with higher capital factor endowments benefit more in terms of income returns from an increase in public investment than those with lower factor endowments. This creates incentives for those with above median incomes to influence the composition of public expenditures towards capital expenditures. Incomes above the median grow faster as government responds to these influence effects and inequality rises. A rise in inequality makes redistribution more attractive to the median voter and a government attentive to such preferences now reallocates expenditures towards transfers and away from public investment. Contemporaneously with the rise in inequality there was the global integration of the Indian economy which required that tax rates be

moderated and the tax system modernized. This resulted in a reduction in the tax-GDP ratios in the economy and a rise in borrowings in order to finance public expenditures. Borrowings can be used for redistribution or to finance public capital formation. Borrowings may also be repaid or not re-paid. Borrowings that finance public capital expenditure increase future income and increases the repayment capacity of the government. Redistributive transfers, however, raise current incomes whilst leaving unaffected future income. As inequality increases and government resorts to redistributive transfers, creditors bothered about the repayment capacity of the government will end up limiting the amount that the government may borrow. A rise in inequality is thus associated endogenously with the imposition of borrowing limits as occurs in the enactment of a fiscal responsibility legislation.

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Appendix I

Inequality in Rural & Urban India

N.B.: Ginis are calculated for a 30 day reference period
of the National Sample Survey
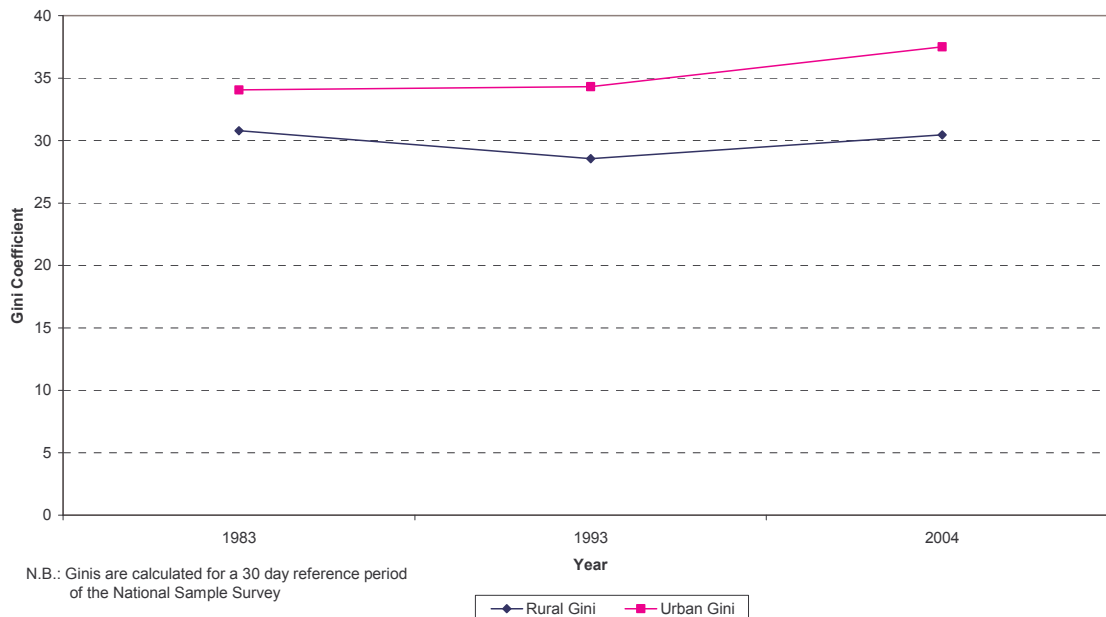
Endnotes:-

♣ The output from the production function can be written as

$$F = KF_K$$

or, $$\frac{KF_K}{\delta} = \frac{F}{\delta}$$

or, $$\frac{KF_K}{\delta} + K_j F_K = \frac{F}{\delta} + K_j F_K$$

Thus, $$K_j F_K = \frac{F}{\delta} + \left(K_j - \frac{K}{\delta} \right) F_K$$

or, $$K_j F_K = \frac{F}{\delta} + \left(K_j - \overline{K} \right) F_K$$

♦ Note that $t\left(\delta_a \overline{Y}_a^{\,g} + \delta_p \overline{Y}_p^{\,g} \right) = t\left\{ \delta_a \left(\overline{K}_a F_K \right) + \delta_p \left(\overline{K}_p F_K \right) \right\}$

$$= t\left\{ \delta_a \left(\frac{K_a}{\delta_a} F_K \right) + \delta_p \left(\frac{K_p}{\delta_p} F_K \right) \right\}$$

$$= t\{K_a + K_p\}F_K$$
$$= tKF_K = tF$$

♥ Let β_a : weight government attaches to the income of the capital abundant individuals

β_p : weight government attaches to the income of the capital poor individuals

Then, $\beta = \dfrac{\beta_a \delta_a}{\beta_a \delta_a + \beta_p \delta_p}$ and $1 - \beta = \dfrac{\beta_p \delta_p}{\beta_a \delta_a + \beta_p \delta_p}$.

The weights β_a and β_p are of course determined by the influence seeking expenditures of the individuals with their respective factor endowments as we see later. Equation (9) then is the standard weighted sum of incomes welfare function $\beta_a \delta_a \overline{Y}_a + \beta_p \delta_p \overline{Y}_p$ divided by the weights $\beta_a \delta_a + \beta_p \delta_p$.

♠ We assume the second order condition holds and that the first order condition gives an interior solution. The second order condition is
$$W_{GG} = \frac{F_{GG}}{\delta} + F_{KGG}(1-t)\{\beta(K_a - K_p) + (K_p - \overline{K})\} < 0$$