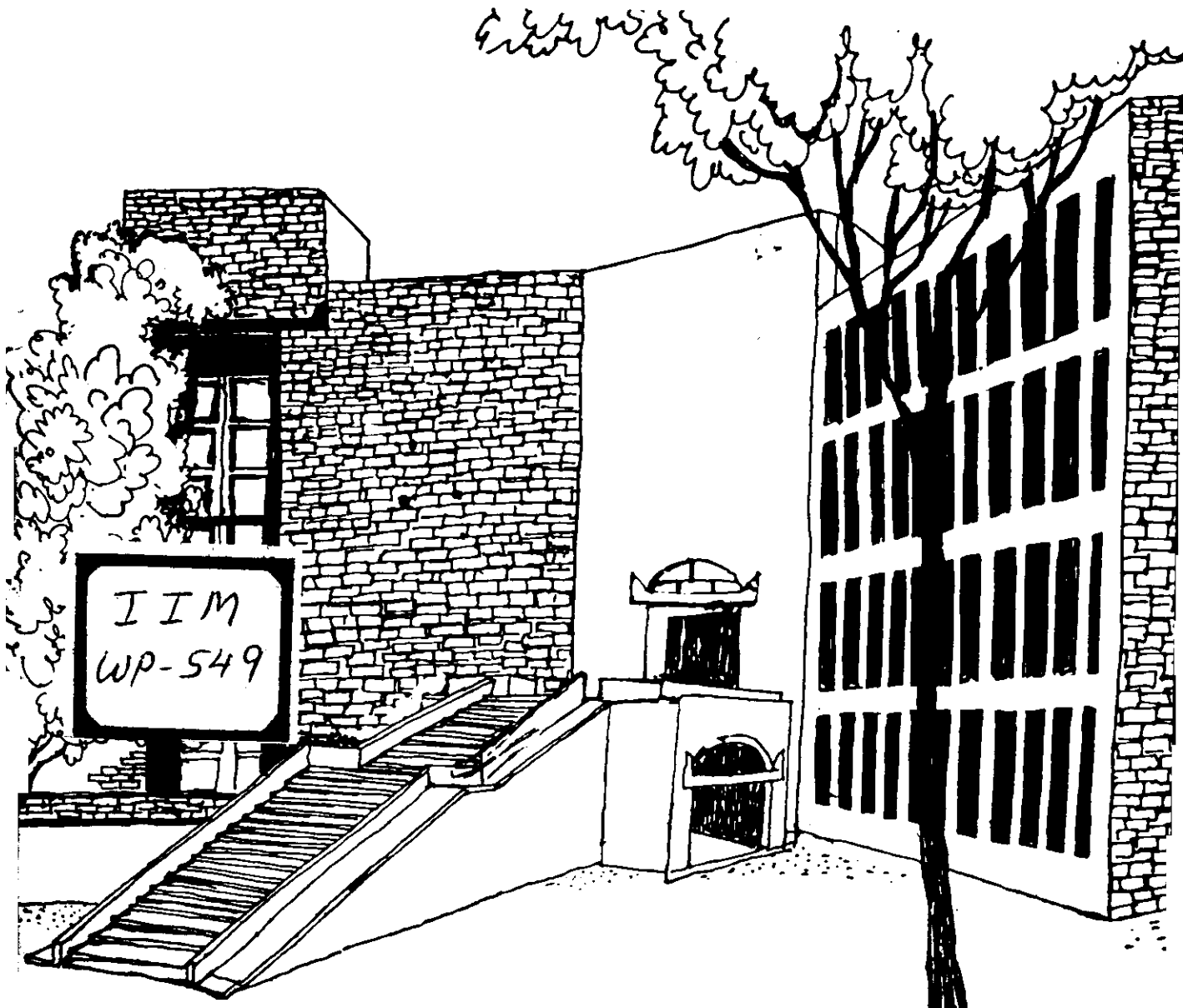




# Working Paper



THE INDIAN AND CHINESE GROWTH EXPERIENCE  
AS CASE STUDIES IN THE APPLICATION OF  
THE FE'LDMAN-MAHALANOBIS MODEL STRATEGY  
UNDER A WAGE GOODS CONSTRAINT

By

Saurabh Kumar

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INDIAN INSTITUTE OF MANAGEMENT  
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A B S T R A C T

The Feldman-Mahalanobis model has played a very important role in shaping the industrialisation strategies of China and India and, of course, earlier the Soviet Union. An unstated, but crucial assumption in this model is that there exists a sufficiently large surplus of wage goods in the final/agricultural sector for the wage goods constraint not to impose limitations on the industrialisation possibilities. The paper attempts to examine the validity of this assumption in both India and China. It is argued that the wage goods constraint has been significantly constrictive in both the countries. A simple theoretical model is also attempted to bring out the consequences of such a circumstances.

I. INTRODUCTION: THE FELDMAN- MAHALANOBIS MODEL AND ITS APPLICABILITY TO THE USSR, INDIA AND CHINA

1. Both India and China have pursued the Soviet<sup>1</sup> strategy of rapid industrialization based on primacy in investment for heavy industry.

The theoretical underpinnings of this strategy were provided by the Feldman-Mahalanobis (henceforth F-M) model<sup>2</sup>, which demonstrated the long run superiority of an investment policy that gave priority to the machine building and other heavy industries over the consumption goods industries. The contribution of this model lay in showing, under certain simplified assumptions made in the model, that even though the output of the machine building industries cannot be consumed directly ('One cannot eat machines'), it pays in the long run to go in for an investment policy of 'making machines to make machines'. It can be shown easily that this implies a marginal rate of saving greater than the average rate, so that a necessary requirement of the F-M strategy is a stepped up rate of saving. In both these respects, namely a high rate of saving and a high proportion of savings/investment channelled into the heavy industry sector, India and China have followed the F-M model policy prescription in essence, though, ofcourse, within this basic approach there have been modifications from time to time. Also, there are differences in the manner in which the two countries have actually implemented the policy recommendations of the F-M model- differences that can, in the final analysis, be traced to the different socio-economic and political structures<sup>3</sup> of the two societies. Yet the underlying vision has been much the same in both the cases. It would therefore seem appropriate to examine the growth record of the two countries in the context of the F-M model

2. One major weakness of the F-M model strategy, that has had an important bearing on the development experience of India and China, was its presumption that there would be available a sufficiently large surplus of food and other agricultural raw materials from the agricultural sector without any need for investment or other resources being channelled into that sector. In other words, the assumption that industrialization could proceed unconstrained by agriculture. By confining **itself** to a 2 sector model of the economy- the manufactured consumption goods and the investment goods sectors- and ignoring the agricultural sector altogether, the F-M model approach implicitly assumed that the agricultural sector could not be a constraining factor in the development process. Investment (and hence growth) was assumed to be limited by the capacity of the investment goods sector, rather than by the capacity of the agricultural sector to provide savings, in the form of

surplus grain over and above the requirements of the rural sector. The unstated, but crucial, assumption thus was that the surplus was large enough to supply the food and other raw materials requirements of the urban sector without any prodding or stimulation in the form of investment by the Government or the 'Central Planning Authority' (CPA). It was because of this simplified assumption that the F-M model was able to bypass the 'agriculture-industry relationship' question<sup>4</sup> altogether and concern itself only with examining the trade-offs involved in the choice between channelling investment into the consumer goods or investment goods sector.

3. In terms of the concepts of 'wage goods', 'capital goods'<sup>5</sup> and 'foreign exchange' constraints used in the text-book framework of planning, the F-M model can be seen to have been based on the assumption that the wage goods constraint was not binding (i.e. there was a sufficiently large slack in the wage goods sector) and only the capital goods (and foreign exchange) constraints were binding. The F-M model policy prescription of primacy in investment for the heavy industry sector would fall through if the wage goods constraint too (in addition to the capital goods constraint) were to be binding, or almost so, since in that case it would obviously<sup>6</sup> be necessary for the CPA to first enhance the surplus of wage goods available from the rural sector before it could hope to relax the binding capital goods constraint by channelling more investment goods into the investment goods sector. And enhancement of the wage goods surplus would require capital<sup>7</sup> for production of irrigation facilities, power, fertilizers etc. The agricultural sector would in this case thus impose a first charge on the investible resources, i.e. on the output of capital goods from the investment goods sector (it is assumed that the same investment goods can be used in the agricultural sector as well). As compared to the F-M model case, where the wage goods surplus is assumed to be large enough to allow industrialization to proceed unfettered by the agricultural sector, there is now forced upon the economy a 'diversion' of a part of the output of the investment goods, away from the path of rapid rate of growth of the economy, to the agricultural sector. Only the remainder would be left for enhancement of future growth potential through re-investment in the capital goods sector. In other words, food (and agricultural raw material) self-sufficiency, taken for granted in the F-M model, can be expected to impose its own limitations<sup>8</sup> on the growth possibilities

open to an economy when the natural conditions are such that it cannot in fact be taken for granted.

4. This presumption of the F-M model, of a freely forthcoming supply of wage goods, was perhaps not too unrealistic an assumption to make in the case of the Soviet Union, where the strategy was first followed and whom both India and China sought to emulate, but it was certainly not met with in the cases of India and China, whose endowment of cultivable land (and, therefore, the "naturally" available rural surplus of wage goods) was much poorer than that of Soviet Union. The cultivable land-man ratio<sup>9</sup> in the USSR at the time it embarked on its First Five Year Plan in 1928 was 2.3 acres/ person, compared to 0.66 in India and 0.43 in China at the time of commencement of their respective First Five Year Plans. In addition, there was considerable scope for expansion of the cultivated area in the Soviet Union. In contrast to this, there has been little or no increase<sup>10</sup> in the cultivated area possible in India and China subsequent to commencement of the planning effort.
5. Not surprisingly then, the per capita output of grain in the USSR even as far back as 1928 was 480-566 kgs.per annum, in contrast to 220-272 Kgs in China, and about 165 kgs in India, in 1952. The Soviet output was thus so large, in relation to the requirements of the rural population, that the surplus was more than sufficient for catering to the needs of the urban population. It permitted substantial indirect/luxury consumption, in the form of meat, liquor etc that is high in the grain to calorie conversion-ratio. This provided a comfortable cushion that could be drawn upon without excessive hardship, in years of bad harvest and in times of political, or politically tormented organizational, disruption (as e.g.during the Stalinist era). It also permitted substantial exports of foodgrains. The large Soviet imports of capital equipment in the 1930s were paid for in foreign exchange that was earned by food (and raw material) exports. In addition, agriculture played a positive role in a policy of import substitution. Industrial crops such as cotton and sugar beet could be rapidly expanded to replace import of these goods and thus free foreign exchange for the importation of capital goods.
6. The Soviet Union was thus exceptionally fortunate in respect of the level of its foodgrains output per capita to start with, which gave it a sizeable grain surplus. It could therefore afford to pursue an 'extractive' policy towards agriculture for quite a long time without having to worry too much about the counter-productive effects of such an 'extractive' policy on the agricultural output levels,

and therefore on the generation of surplus, because of its adverse impact on the motivation <sup>11</sup> of the peasants. The only question before the Soviet leadership was how to mobilize that surplus in the hands of the State for usage in accordance with its preferences. Given the tight control and strong coercive power of the Soviet State, especially under Stalin, it was able to expropriate the surplus of wage goods available in the rural sector through a combination of severe taxation and adverse terms of trade for agricultural goods (minimal quantities of manufactured industrial and consumer goods offered in return for the output of the agricultural sector). It is a measure of the cushion in the agricultural sector available in the Soviet Union that, despite these harsh measures, the percentage of agricultural output marketed by the peasants to the State kept rising steadily and the Govt. was even able to earn foreign exchange through exports of agricultural goods in the early years of its planned development to pay for its import of machinery. Right until the fifties, agricultural investment was held at a minimum and many agricultural problems that did not immediately affect industry were allowed to accumulate. Though this brought the Soviet economy to a crisis by 1953, necessitating a program of agricultural reform-increased investment for agriculture, improved terms of trade, etc- in 1954, the successful deferral of these problems until then should perhaps be regarded as a major achievement of the early years of planning. It gave the economy sufficient breathing time, for by then a reasonably strong industrial base had been built up for it to be able to afford the 'diversion' of investible resources to the agricultural sector required for continued generation of wage goods surpluses.

7. This was not at all so in India and China. India faced a serious food situation after Independence. Decades of neglect of food production, under the British rule had ~~turned~~ India into a net importer <sup>12</sup> of foodgrains even before World War II. The position worsened after Partition with many of the traditionally food surplus areas falling to Pakistan and because of the large scale losses of livestock etc and disruption of agricultural production caused by the communal holocaust and wholesale migration of population. It therefore had to import foodgrains in fairly large quantities in the early post-independence years. In fact, the trend of imports continued throughout the post-independence period until the late seventies, except for a brief respite in 1954 and 1955 and in 1972 (when import levels were nominal). Though not a substantial proportion of the total output, they were large enough in absolute levels for speculative forces to play havoc with food prices in their absence and cost the national exchequer a sizeable fraction of the nation's export earnings.



the nation's export earnings.

8. China was somewhat better placed than India, being nominally surplus in foodgrains in the early post-'liberation' (post-1949) period, which it exported in small quantities. Even so, its per capita output level, at 220-270 Kgs p.a. was not comfortable, like that of the Soviet Union. The little slack that there was for the wage goods constraint to become binding soon began to exhaust<sup>13</sup>, so that before long a conscious effort had to be made to increase it.
9. Thus unlike in the Soviet Union, the problem in the cases of India and China was not just one of expropriating<sup>14</sup> the surplus in the hands of the State or transferring it to the urban sector, but of increasing the volume of the surplus itself in the first place. And, in as much as this required capital and other (organizational) resources that had alternative uses in relaxing the capital goods constraint, this adverse natural circumstance can be said to have placed limitations on the growth possibilities available to India and China as compared to that of the Soviet Union.

## II. EVOLUTION<sup>15</sup> OF POLICY IN INDIA AND CHINA

10. This was, however, not appreciated in the beginning. At the time of commencement of planning, both China and India appeared to have had no doubts about the feasibility of duplicating the Soviet achievement under their conditions. China, which was nominally surplus in foodgrains, not surprisingly, adopted the Soviet approach in toto without much debate<sup>6</sup> right from the beginning. In India, Brahmananda<sup>17</sup> and others questioned the relevance of the F-M strategy for India because of its assumptions regarding the availability of wage goods and opposed the Capital-intensive pattern of industrialization envisaged under the policy of priority for heavy industry. But theirs remained a minority view that was brushed aside by official policy and heavy industry was given high priority in the investment allocation from the 2nd Plan<sup>18</sup> onwards. (Tables I & II).
11. This rather unquestioned optimism with which the F-M strategy was adopted was, of course, not entirely unwarranted either as there was a marked improvement in food supply position in the early years. The disruptive effects of Partition had largely been overcome in the course of the First Five Year Plan. Being more an exercise in consolidation of departmental schemes envisaged before independence than in attempting to give a new thrust to the economy, the First Plan stressed agriculture and irrigation projects

servicing agriculture. **A**verage also expanded by some 15%. As a result of these measures and gradual restoration of normalcy in the economy the food situation slowly improved and came to be regarded as comfortable by the mid-fifties, when the 2nd Five Year Plan, based on the F-M model was being formulated. What was, with the benefit of hindsight, a crucial failing, however both in India and in China (but India more so than China) was the failure to foresee that the seemingly comfortable food position was rather precarious, given the high vulnerability of agriculture in both countries to weather fluctuations and the rapidly rising demand for food from their large, hitherto underfed and fast growing populations. The consequences of this omission were not long in coming.

12. The Government had to resort to concessionary food imports under PL-480 from the end of the 2nd Plan onwards because of the failure of production to meet the requirements. Attainment of self-sufficiency in food grains was accordingly the principal objective in agriculture in the Third Plan that was drawn up at this time, but no significant changes were made in the investment allocation pattern of that plan in favour of agriculture. The realisation that the "generalised" approach to agricultural development followed hitherto through the Community Development and extension programmes and spread of the pre-independence "Grow More Food" schemes had not resulted in sufficiently increased production. Recognition of the need to realise quick increase in output of food led to the launching of the IADP in 1961, and the IAAP in 1964. These aimed at increased production in favourable areas through application of a package of inputs and associated improved practices. Though there was some increase in production in the areas covered by the Programme, these were not very significant and food imports continued.
13. It was the severe drought of 1965/66 and 1966/67 (which is regarded to have been the severest drought of the century, requiring import of 19 ~~mt~~ of foodgrains in just two yrs - see Table 13) that forced a reconsideration<sup>19</sup> of the place assigned to agriculture in the overall strategy of development. The abject failure on the agricultural front during these years upset so many assumptions made in the original Draft IVth Five Year Plan (1966-67 - 70-71) that it was decided to treat the years 66-67 - 68-69 as a period of "Plan holiday" (also called "Annul Plan") and defer the commencement of the IVth Five Year Plan till 1969. The policy of meeting food requirements through aid (PL -480 concessional imports) followed so far was clearly recognised to be infeasible and achievement of self-sufficiency in foodgrains now truly became the major

concern of Government. The Agricultural Prices Commission, which today plays a vital role in the fixation of procurement prices, was set up in that year (1965) to advise the Government on price Policy for agricultural commodities and was followed soon after by the establishment of the Food Corporation of India for procurement and public distribution of foodgrains. The experience of the package programme, which was the precursor of the Green Revolution strategy that now followed, had already shown the benefits of application of a package of inputs, such as fertilizers, irrigation etc, in selected well endowed areas. The fortuitous arrival of the High-Yield strains of wheat and maize from Mexico, that were capable of high yield response to irrigation and heavy doses of fertilizers at this time further accentuated the attractiveness of such an approach which, Indian policy makers "plunged for with alacrity."<sup>20</sup> It led to the Green Revolution strategy of stepping up food output with the help of intensive application of a package of industrially manufactured inputs- chemical fertilizers, pesticides, assured irrigation (tubewells with diesel or power driven pumps and motors) etc. Thus was inaugurated in the period of three Annual Plans the era of "industrial input stimulated farming" in India.

14. Of course, as is frequently the case with many Government programmes there was at first no clear enunciation of a comprehensive agricultural policy ever as the new strategy of agricultural development was being implemented. It was the Draft IV Five Year Plan (1969) that contained for the first time an explicit and elaborate presentation of issues connected with agricultural policy and recognised that the pace of development in the agricultural sector set a limit to the growth of industry and exports and therefore of the economy as a whole.
15. In order to induce the farmers to take to this new "input-intensive" agricultural technology, it became necessary to provide a whole series of incentives in the form of subsidised pricing of fertilizers and irrigation facilities, easy availability of credit etc. and 'remunerative prices' for agricultural output to compensate them for the increased cost of production. By 1982-83 food and fertilizer subsidies<sup>21</sup> alone had soared to approx. Rs-1368 crores, 7% of total central Govt. expenditure and larger than the entire deficit of the Government of India on revenue account. In addition, there has been considerable investment undertaken, both in the public and private sectors, in capital-intensive industries supplying inputs for agriculture (irrigation and power facilities, chemical fertilizers, power tillers, diesel pumps, cement etc) and

in Govt. administrative expenditures for running various rural development programmes. Taken together, these measures clearly left lesser resources for reinvestment in the heavy industrial sector than would have been possible if the agricultural output desired had been forthcoming of its own, without feeding of capital inputs from the industrial sector as in the Soviet Union. While the food self-sufficiency that India achieved as a result by the end of the seventies (subsequent food imports have been small in quantity and aimed at replenishing buffer stocks and countering speculative price rises) has received wide publicity, it is not often appreciated outside the small group of economists specialising in inter-sectoral resource flows that this increase in food output is in gross terms and a proper assessment of the net gain can be made only by taking into account the resources that have gone into agriculture in the form of investment and budgetary funds, with a high opportunity cost in terms of the growth possibilities foregone in order to make possible the level of output actually realised. A significant part of industrial activity can thus be said to be "mortgaged" to agriculture, and its output should perhaps be looked upon more as an intermediate, rather than a final, good

#### 16. CHINA: FIRST FIVE YEAR PLAN 1953-57

As mentioned earlier, China began by copying the Soviet strategy in toto and unquestioningly. Unlike in the Soviet Union, where the 1st Five Year Plan was drawn up after intense debate<sup>22</sup> between the opposing views of Preobrazhensky and Bukharin on the relationship between agriculture and industry and the nature of the transition to industrialisation, the formulation of the 1st Five Year Plan was not preceded by any such debate as to the appropriate path of development. In fact, the Chinese went to greater extremes than the Soviets in their plan investment ratios in favour of Industry, and within the latter, in favour of heavy industry. Compared to the Soviet Union's 19.2% and 40.9% of the total investment funds allocated to agriculture and industry respectively, China allocated 14.9% and 47.9%. Actual expenditures were even more extreme 7.1% and 36%. The overall accumulation rate in both countries was about the same -24%. The main features of the 1st Plan were:

- i) Highest priority for development of heavy industry
- ii) Main attention to the 694 "above norm" projects, especially the 156 projects to be constructed with Soviet help.

- iii) Increase in wages to be kept below increase in productivity to secure capital accumulation.
- iv) In agriculture, concentration on production of grain and industrial raw material, with strong emphasis on the need to increase the agricultural surplus product "in order to finance industrialisation".

17. The last point notwithstanding, the investment allocations did not reflect such an emphasis on agriculture. The agriculture surplus was sought to be enhanced through institutional reform measures-land redistribution to the small peasants, followed by cooperativisation of farming so as to enable realisation of economies of scale, creation of a congenial environment etc; Though the moves towards collectivisation of agriculture were prompted primarily by ideological considerations, there clearly was an economic rationale for them as well. Given the historical alliance between the Chinese Communist Party (CCP) and the peasantry, the latter were more receptive to the agrarian policies of the CCP and collectivisation of agriculture was a much smoother process than in the Soviet Union. Output grew steadily during the 1st Plan and, since this was achieved without any significant increase in the use/in/of the factor inputs or technical progress, it can be said to have grown on the strength of organisational reform. The trend rate of growth NVA in Agriculture was 3.8% p.a. and, together with the 19.6% p.a. growth in the NVA in industry, this led to an 8.9% p.a. rise in national income.

18. The performance of the economy during this period which is rated highly by the present day leadership, is attributed to proper balance being maintained between agriculture, light industry and heavy industry. According to Xu Di Xin, one of the leading economists,<sup>23</sup>

"Although there was some problem with the structure of economic management and a tendency towards excessive centralisation (during the 1st plan period) the crucial question of achieving a balanced relationship between accumulation and consumption and between various economic spheres was handled well. ..Development was both rapid and stable and there were no large scale fluctuations upwards or downwards". (Xu Dixin, 1983 p.8).

Similarly, another economist has the following to say:

"The main reason for our success was that...we paid a fair amount of attention to the development of agriculture and light industry and we did not resort to expropriation

of the peasants....As a result, we ensured the rapid growth of heavy industry, while guaranteeing agricultural and light industrial development". (Liang Wen Sen, 1982 pg. 58).

19. While it is true that the performance of the economy during this period was good, the claim that this was due to a conscious effort to maintain "proper balance" between agriculture, light industry and heavy industry appears to be an exaggerated one. The investment allocations for agriculture and light industry do not bear out such a claim. Of course, in agriculture, considerable stress was laid on organizational and institutional reform but this was not complete until the closing years of the 1st Plan and so can not be taken as more than a partial explanation for good agricultural performance. What is more likely is that because the position with regard to food supplies was not so tight to begin with, it took some time before the weakness inherent in the strategy surfaced. Likewise in the case of light industry, it was perhaps possible to pull through with only 6% of the investment funds allocated to it because of the inherited capacity in this sector<sup>24</sup> (an over-whelming proportion of the industrial capacity of Pre-'49 China was in the light industrial sector). That this is more likely the case is suggested by the fact that, on their own admission, the first signs of imbalance were already beginning to appear during this period:

"The main symptom of this (imbalance) was the instability in agricultural and light industrial production"....."We were forced to introduce compulsory procurement systems for the major agricultural products such as grain, cotton and edible oils"....."Light Industry was adversely affected by the shortage of agricultural raw materials and some heavy industrial production could not satisfy the demands of agricultural and light industrial development". (Xu Dixin 1982, pg.59).

20. These incipient problems being encountered by the economy did not remain unnoticed. At an enlarged session of the Politburo in April 1956, that probably met to consider them Mao delivered his celebrated speech "On Ten Great Relationships". The agriculture-industry relationship was one of them. He stressed a more balanced development of the economy, i.e. more stress on agriculture, than had been given until then. But Mao did not yet give up<sup>2</sup> the policy of primacy for heavy industry. "The root cause of the failure to increase agricultural production in some countries is that the States' policy towards the peasants is questionable. The peasants burden of taxation is too

heavy while the price of agricultural products is very low, and that of the industrial goods very high. While developing industry, especially heavy industry, we must at the same time give agriculture a certain status by adopting correct policies for agricultural taxation, and for pricing industrial and agricultural products". (Mao 1956:63). (Emphasis added).

"In the future we must put some more investment into light industry and agriculture so that the proportion of investment they receive is increased. When we increase this proportion, does this mean that we have changed the key sector? No, the key sector not been changed. It is still heavy industry, but more emphasis will now be put on light industry and agriculture" (Mao, 1956:63).

21. The moderation in favour of agriculture and light industry argued for by Mao did not, however, take place. "This policy of Mao (of simultaneously developing industry and agriculture within the framework of giving priority of heavy industry) required that the preferential treatment for the development of heavy industry should be based on agricultural and light industrial growth. In operational terms it would have meant a readjustment of the investment allocations in the economy in favour of agriculture and light industry. But it remained unimplemented. The readjustment did not take place.... It is much to be regretted that we did not persist in this policy". (Liang Wen Sen 1982, pg.59).
22. 2nd FIVE YEAR PLAN (1958-62)  
The failure to implement these changes in favour of agriculture and light industry can be attributed to the political developments of that time. It is well known<sup>25</sup> that there were severe differences within the topmost political leadership on various issues relating mainly to the pace of collectivisation of agriculture and that these culminated in the "Great Leap Forward" (GLF) of 1958, which Mao succeeded in pushing through, despite reservations on the part of most of the other Chinese leaders. This movement torpedoed the Plans drawn up in 1956 and heralded a radical phase in Chinese economic policy.
23. Because of some unorthodox measures that were adopted at this time (such as mobilisation of surplus labour and its substitution for capital for the purpose of further capital accumulation; radical changes in the management of industrial enterprises and agricultural cooperatives in favour of greater participation by the people and lesser direction and control etc.) it has been widely believed that

the "Great Leap Forward" broke with the economic priorities of the Soviet model. However, as Brodsgaard (1983) as argued, recently revealed Chinese data clearly show that as far as the basic Soviet strategy of industrialisation based on high investment and priority for heavy industry goes, the GLF actually represented an intensification of that strategy rather than a break with it. His argument is summarised below in paras 24 and 25.

24. "During the First Five Year Plan, the average rate of accumulation was 24.2%—about the same percentage as that of the Soviet Union during its First Five Year Plan. This investment pattern, modeled upon the Soviet experience, was regarded as a sound approach to the problems of modernising and industrializing China. In 1956, the First Session of the Eighth National Congress of the Communist Party decided to maintain an accumulation rate of approximately 25% in the Second Five Year Plan period. However, the accumulation rate went up abruptly from 24.9% in 1957 to 33.9% in 1958 and up 43.8% in 1959. Thus one of the characteristics of the GLF was a very high accumulation rate.
25. Not only were the accumulation rates excessively high, but the inherent imbalances of the First Five Year Plan period were aggravated during the GLF period, in spite of Mao's 1956 statement on the necessity of correcting these imbalances. Thus during the First Five Year Plan, 46.5% of capital construction investment went to heavy industry. During the GLF years, 1958-1960, the figures were 57% 56.7% and 53.3% respectively. Light industry had its investment share cut from 5.9% during the 1st Plan to 4.0% in 1960. Agriculture received increased investments compared to the First Five Year Plan, the relevant figures being 7.8% for 1953-1957, and 10.5% for 1958-1959".
26. In short, during the GLF years capital investment in heavy industry was higher than during the First Five Year Plan period, with the increase in metallurgical industry being the most spectacular. Investments in light industry had dropped, while agricultural investments showed a slightly rising trend.
27. The Great Leap Forward did, however, confront the agricultural problem squarely. Not only were investments into the agricultural sector increased (these increases were only nominal and did not form the mainstay of the effort), but an attempt was made to find a method other than increasing State investment in agriculture for increasing the rural surplus of wage goods.<sup>27</sup> Large scale mobilisation of labour was undertaken for building capital assets in the rural areas in the slack agricultural season. In addition,



a massive rural industrialisation programme, based on mobilisation of local, and hitherto unused, resources was launched. "Backyard Commune run industries" mushroomed in almost every commune and brigade. Both these measures were aimed at raising the productivity of agriculture through improvement of the quality of land and irrigation supply of improved tools, simple machinery and other industrial inputs such as cement etc. Finally, the Great Leap Forward sought to carry forward the cooperativisation of agriculture to new heights through the formation of large communes.

This last measure boomeranged very badly and proved to be the undoing of the Great Leap Forward. Excessive zeal on the part of local party cadres in raising the level of collectivisation proved to be totally counter-productive because of its adverse impact on the morale and motivation of the peasants. It led to widespread organizational disruption and caused agricultural production to drop to precariously low levels: Thus,

"Particularly during the movement to organise peoples communes in 1958, the peasants got discouraged as a result of the stirring up of a "communisation wind", excessively high quotas for state purchases and the issuing of arbitrary directions" (Ma Hong, 1983 pg.44) The difficulties were compounded by the severe drought of the three years 1959-61, and (though this is not so relevant for agriculture but for the other sectors of the economy), by the abrupt Soviet withdrawal of their technicians after the Sino-Soviet rift in 1960. It is, of course, impossible to disentangle the relative impact of these factors and therefore to verify whether the charge of the present day Chinese leadership that the economic downturn was overwhelmingly due to the GLF is exaggerated or biased. What is certain is that the shortfall in food production was so extraordinary that it was not until 1964 that it recovered to 1957/58 levels. It was made worse by the widespread tendency of local cadres to exaggerate the GLF production achievements. State purchases were conducted (forcibly) on the basis of those questionable reported harvest figures, with the result that peasant consumption touched an all time low<sup>28</sup> of 91 kgs by 1961. Latest Chinese media disclosures<sup>29</sup> of the number of starvation deaths in the aftermath of the GLF speak of numbers of the order of tens of millions, which is well above even the most rabidly anti-Chinese foreign estimates of that time.

1963-65

The unprecedented food crisis of 1959-61 finally gave a jolt to the preference for an industrialisation strategy based on primacy for heavy industry. The political crisis precipitated by the aftermath of the GLF "ultra-leftist" attempt to launch a "communisation wind" was resolved with the relegation of Mao to the background and assumption of leadership by Liu Shao Qi & others. At a Central Work Conference of the CCP in the summer of 1960, it was decided to "change decisively the priorities of economic policy". The slogan "simultaneously developing industry and agriculture with priority to be given to heavy industry" was substituted by "take agriculture as the foundation and industry as the leading factor". A "mass movement for aiding agriculture" was launched, with a spate of articles in the media expounding on the new priorities and policy. In concrete terms, the accumulation rate was brought down to 22% and the proportion of non-productive accumulation (housing, education etc.) vis-a-vis the productive accumulation raised from 13% during the GLF period to 35%. Considerable State investment was undertaken in Chemical fertilizers and agricultural producer goods industries, while there was a cutback in heavy industry. A moratorium imposed on "capital construction" (i.e. investment) projects and over 10,000 of them begun under the GLF were suspended. Inefficient plants, including a large number of "backyard steel furnaces" set up under the rural industrialisation drive were closed down (Mu Qiao, 1981)

30. Yet these adjustments could do not more than bring the proportion of investment in agriculture, light industry and heavy industry to be 17.7%, 3.9% and 45.9% respectively- which, while they represented an improvement over the extreme imbalance of the GLF period, were still more skewed than the proportions during the first Plan and a far cry<sup>30</sup> from the stated intention of reversing the order of priorities from heavy industry first, light industry second and agriculture last to agriculture first, then light industry and finally heavy industry. The main stress on agriculture during this period came not in the form of increased investment allocations but of organizational and institutional reform<sup>31</sup> that reversed the high degree of collectivisation brought about by the GLF and provided for greater individual incentives for peasants.
31. By 1963, agricultural (and industrial) production began to pick up but per capita consumption of foodgrains and cotton cloth could not recover to 1956 levels even by 1966. The period 1963-65, known in China as the period of "Recovery and Readjustment", is looked upon very positively by the present leadership since it was under their stewardship

that the post-GLF recovery was carried out by means of policies similar to those being implemented in China today. Thus:

growing

"This change worked effectively during the period of economic readjustment which lasted from 1963 to 1965. Industry and agriculture achieved a new balance. The gross value of industrial and agricultural output rose at 15.7% annually, with industry / at 17.9% and agriculture at 11.1%. National income grew at a rate of 14.5%. Labour productivity in State-owned enterprises achieved an average annual increase of 23.1%. Average annual consumption by wage earners and peasants increased by 1.2% and 4.5% respectively. Production and commerce rapidly revived and developed, and living standards began to improve". (Liang Wen, Sen, 1982, p.60)

### III & IV FIVE-YEAR PLANS: 1966-70, 1971-75

32. The period 1966-76 covers the Cultural Revolution decade, when Mao had ousted the 'Reform and Readjustment' faction and other moderate leaders who were in the ascendant during the post GLF period, from power. Radicalism held sway over economic and other policies, with many similarities. Thus, accumulation went up to 26.3% in the 1966-1970 period and further upto 33.0% during the Fourth Five-Year Plan period. Heavy industry had its share of total investment increased to the detriment of agriculture and productivity. accumulation increased considerably compared to nonproductive accumulation, while there was a minimal increase in the investment share of light industry.
33. Not surprisingly, this period is evaluated negatively by the present leadership:

"High targets for the development of heavy industry were set again and the one-sided emphasis on heavy industry and on steel production reasserted itself. The annual steel output target for the end of the Third Five-Year Plan (1966-1970) was 20 million tons and for the end of the Fourth Five-Year Plan (1971-75) it was 35-40 million tons. The latter target eventually had to be reduced to 30 million. The resultant misallocation of resources once more upset the hard-won relative balance between industry and agriculture". (Liang Wen Sen 1982 p.60)

### V. FIVE YEAR PLAN : 1976-80

34. Although the purge of the "Gang of Four" in October 1976 immediately after the death of Mao is often officially to mark the end of the Cultural Revolution period, the Fifth Plan was a non-event because of the political

uncertainty and the shifting political alliances in the post-Mao period. The early post-Mao leadership was pre-occupied with restoring order across the country, so that no new initiatives could be taken. In February, 1978, an ambitious 10 year Plan<sup>32</sup> for modernizing the economy was formulated on the basic principle of "taking steel the key link". Conceptually, it was a continuation of the hitherto followed Soviet strategy of a high investment rate with primacy to heavy industry and the only thing new about it was the ambition of the targets. Less than a year after its adoption, this plan was given up by the new leadership<sup>33</sup> under Deng Xiaoping that had meanwhile assumed power after the 3rd Plenum of the 11th Central Committee of the Chinese Communist Party in December 1978. The targets set under the February 1978 plan were described as "impetuous and unrealistic" and its basic approach based on priority for heavy industry, "faulty". In the words of Xue Mu Qiao(1981)

"A 1985 target for steel output of 60 million tons was first set and to achieve this target it would be necessary to build two or three steel plants in five or six years with corresponding increases in coal, electric power, and transportation. Inevitably, agriculture and light industry would be given short shrift. Despite the discovery that capital construction had already been over extended in the previous two years and serious bottlenecks had developed, investment kept growing in order to ensure the completion of the high target for steel of 60 million tons. In 1978 with a 50% increase in the basic construction appropriation within the state plan, investment expenditure reached 48 billion yuan, which represents an increase of 32% over 1977, twice as fast as the growth rate of heavy industry (15.6%) and two and half fold the growth rate of the national income(12%). This simply exposed the serious imbalance of the national economy".

35. At the same plenum meeting of Dec.1978, it was decided to launch The "Readjustment Reform, Consolidation and Improvement" (RRCI) drive to revamp the economy. . . . referred to the decision to reverse this long standing policy of primacy for the heavy industrial sector (and of the high investment rate that went with it). It was openly admitted that such a 'strategic shift' in the State Investment allocation funds in favour of agriculture (and light industry) had become necessary in order to correct the 'structural imbalance' in the economy that had crept in due to long years of neglect of the agricultural and light industrial sectors. Thus

"Agricultural development cannot keep up with the needs of national economic development and this has become an important factor limiting the rapid development of the national economy. Although the agricultural population comprised 83.8% of the total population, and the agricultural labor force made up 84.9% of the combined industrial and agricultural labor force, the supply of agricultural products still cannot meet the needs of the developing economy". (Ma Hung, 1983, pg.35). And similarly,

"To this day when about 80% of China's labor force is still engaged in agricultural production...Some of the farmers of grain crops are underfed; some pig farmers seldom have meat. We are still importing for the urban population of a fairly large portion of the foodgrains and part of the cotton, edible oil, and sugar". (Xue Mu Ciao, 1981). )

36. According to the State Statistical Bureau's own calculations though the overall trend rate of growth of output of foodgrains over the period 52-78 was at 2.4%, nominally ahead of the population growth rate of 2.0%, this conceals the severe fluctuations from time to time. There were periods when the "rate of increase of grain output was even lower than the rate of growth of population". Moreover such gross calculations based on estimates (and not actual marketed supplies) of output do not indicate the true extent of the shortfall. Since 1961, China has consistently been a net importer of foodgrains in increasingly larger quantities, with import levels crossing the 10 mmt. mark by the late seventies and 20 mmt. by 1982. Such high levels of imports are not consistent with an overall rate of growth of foodgrains above that of the population, especially when it is admitted by Chinese economists themselves that per capita consumption levels in 1978 were no higher than in 1957. (Since 1979 there has been some improvement in per capita consumption levels, but this too cannot account for the excessive imports, especially when domestic output too is reported to have risen sharply during this period.
37. Given the urgency of the task of increasing food production, and the fact that changes in investment allocations take long<sup>34</sup> to be affected, it is understandable that the Dec:78 plenum chose to rely on organisational reform for immediate increases in output as in the 61-65 period. The absence of a clear and visible link between individual effort and individual reward, because of the unrealistically high degree of collectivisation and increasing State direction and control of farming since the Cultural Revolution had led to poor motivation of the peasants to work hard. The plenum recognised that peasant morale was very low due to inadequate incentive and that in an activity like

agriculture, the yield is highly susceptible to the quality of the labour input in most operations as e.g. in ploughing, preparing the field, manuring etc. because of the biological nature of the productive process. It therefore, quickly moved to relax the tight organisational control of the preceding years by curbing State interference in farming decisions and allowing the peasants maximum freedom to decide on cropping patterns, labour allocations etc. themselves. At the same time, the institutional structure in the rural economy was re-organized to establish clearly identifiable linkages between individual effort and gain. Under the "production responsibility system" now in vogue, farming is virtually an individual house-hold activity, short of ownership title to the land

38. At the same time, the Dec.'78 plenum also decided to improve significantly the terms of trade for agriculture by raising the purchase prices of agricultural products. As for the decision to reverse the policy of primacy for heavy industry in favour of agriculture and light industry, statements of intent and policy, discussion in the media and academic literature emanating from China on the favour of agriculture and light industry apart, actual investment allocation ratios since 1979 do not show any radical departures from the past trends. To the extent that they refer only to State investment, ofcourse, the figures understate the actual investments made in agriculture since, with greater freedom for decision making and enhanced incomes because of improvement in the terms of trade for agriculture, peasants would themselves also be investing. Even so, the proportions are unlikely to show any drastic changes<sup>35</sup> since private investment by the rural collectives is small in magnitude.
39. The small magnitude of the changes in the sectoral investment allocations cannot, however, be taken to mean little or no change in the resources being devoted to agriculture by the State. The improvement in the terms of trade for agriculture brought about through enhancement of the purchase prices of agricultural goods imposes a burden on the State exchequer no less, since for political reasons, the issue price of foodgrains cannot be raised equivalently. The funds thus required for subsidising the (urban) consumers and inducing the farmers to deliver a larger surplus constitute a diversion of the investible resources. Improving the terms of trade is really an alternative way of getting the peasants to produce, and part with, more of wage goods. The difference, as compared to doing so by using the same resources for increasing the investment allocation for agriculture, lies in the nature of the

sectoral investment allocations finally generated. The higher prices (and incomes) received by the peasants would be used by them mainly to purchase more consumption goods and only a small fraction perhaps for purchasing investment goods. If this demand pattern (of the additional purchasing power put into the hands of the peasants) is to be met in a non-inflationary way, the supply of consumption (light industrial) goods would have to be stepped up accordingly by suitably reallocating the output of the investment goods to the light industrial sector. Thus the final effect on investment of the improved terms of trade for agriculture is to enhance the investment in the consumption goods sector and to cause, to that extent, a 'diversion' of the investment goods away from the F-M model path of reinvestment in the investment goods sector. Straightforward allocation of the investment goods to the agricultural sector would have led to a similar 'diversion' of the investment goods away from the F-M model path, but it would have been towards the agricultural, and not the light industrial, sector. By offering higher purchasing power to the peasants, the hope really is to induce them to put in more (and better quality) labour (i.e. sacrifice leisure and cut down sloppiness), increase the output and marketed surplus of wage goods and exchange it for light industrial goods. Increased allocation of investment to agriculture seeks, on the other hand, to enhance the output of wage goods by increased application of capital as a factor of production in agriculture. So the difference really lies in the substitution of capital for labour in the agricultural sector. From the point of view of the State, there are costs attached to both the alternatives. One imposes them directly by preempting a part of the output of investment goods for the agricultural sector while the other does so indirectly, by preempting a part of the output of investment goods for the light industrial sector and using the additional output of light industrial goods to induce additional output of (food) wage goods.

40. In addition to the improvement in the terms of trade, the 3rd plenum also decided to remit some agricultural taxes and to step up state financial aid to agriculture. A special development fund was also set up for helping agriculture in the backward regions. The magnitude of the budgetary resources involved in all these measures is, however, not known as the Chinese Government does not publish as yet details of its budget.

41. These measures are reported to have worked wonders: the average rate of growth of the GVAO over the 1978-82 period was 7.5% p.a., more than double that in the preceding 20 years. While the corresponding figure for the NVAO, corrected for the improved terms of trade of agriculture, would be a better indicator of the impact of the organisational measures, even if it is conceded<sup>37</sup> that they led to a spurt in agricultural production, it is evident that this increase is more likely to be in the nature of a one time increment sustained increase in the surplus can come only from greater input usage and/or technical progress that raise the productivity of labour in the agricultural sector. And given the already high land yield levels of all crops in China, this would be increasingly costly. Moreover, marketed output did not, however, increase in the same proportion as the total production, necessitating record levels of imports (Table: ). As discussed in the next section, this was due to higher retention of the output by the peasants for self-consumption.

42.)  
43.)

Please see at the end. \_\_\_\_\_

44. III FOREIGN TRADE IN AGRICULTURAL GOODS

Tables V & VI show Chinese agricultural exports and imports, in comparison to total exports and imports for the seventies. Exports of agricultural commodities exceed agricultural imports (this is true of most years since 1949) by a significant margin: The net agricultural foreign trade surplus has been an important source of financing the high priority non agricultural imports. Thus in the first half of the seventies, it financed, on an average, about 20% of non-agricultural imports. More important, even during 1977-79, when the commitment of the post-Mao leadership to raise living standards led to a sharp rise in food grains and cotton imports (to feed the expansion in output of textiles), a surplus was maintained in agricultural trade, although at a substantially reduced level.

45. This has been achieved by a policy of tightening consumption of high value items such as rice, fruits, vegetables, live animals and meat (the latter two mainly for HongKong, which offers a ready market for these items because of its proximity and inability to meet its own requirements). As a proportion of total domestic production and consumption, the quantities of these items exported are not significant and given the capacity of the Chinese system to ensure social austerity, the sacrifices involved have perhaps not posed much of a



problem. Thus, the exports constitute less than 1% of total Chinese <sup>rice</sup> production. Yet in the world trade, they are sufficiently large to rank China among the world's top rice exporters.

46. The level of exports of agricultural goods do not appear to be correlated closely with the annual production levels. Imports levels, however, do appear to depend directly on the annual output, rising sharply in years of shortfall (post 1959-61 crisis and again after the poor harvests of 1972-73). Although agricultural goods' export policy has never been spelt out explicitly, the consistently higher level of exports than imports, even during the recent years of high imports, suggests a conscious policy of endeavouring to export at least as much as to cover the cost of agricultural imports, and as much more as possible.
47. Higher levels of production and procurement are not the only factors governing the level of imports. The political climate has been a strong determinant: in 1972-73, but even more so in the post '77 period when there were bumper harvests year after year, the liberalised political and social policies that allowed and encouraged greater consumption on the part of both the urban and rural population have been largely responsible for the high import levels. Increased urban demand for foodgrains could not be met despite the enhanced supplies from the rural sector.

The severity of the wage goods constraint is manifest in the above mentioned trends. Both during radical and liberalised phases, import levels have had to be high- during the former periods, levels of consumption were austere but the output and procurement too was low, leading to a demand-supply gap; during the latter periods, output and procurement is high but so is the demand, so that there is again a gap between demand and supply and, in fact, a much larger one than during periods of tight control. The fact that whatever be the level of imports-low or high, they have so far always been more than paid for by agricultural exports does not detract from this argument. These earnings could have been used for financing other essential imports or to raise consumption levels if there had been no compulsion to import food.

49. Tables VII and VIII show India's record in respect of the role played by foreign trade in agriculture. Leaving aside the early years, the balance of trade of agricultural foods figures show India in much poorer light compared to China. However, if fertiliser imports are excluded (as in the case of China), the balance of trade in agricultural goods turns out to be positive, and significantly so, for all but one year in the post-70 period for India also. Yet, the magnitude of the surplus, at about 10% of the total non-agricultural imports, still falls short of the Chinese case of the agricultural surplus financing about 20% of non-agricultural imports.
50. The bulk of the agricultural exports in India's case arise from cash crops - tea, coffee, cashew, tobacco and sugar and fish and oil cakes. Though these items also involve tightening of belts on the domestic consumption front, export items do not consist of foodgrains, as in China.
51. On the import side, while wheat imports formed the overwhelming proportion of imports upto the mid-seventies, edible oils took over as the number one charge on the import bill since the late seventies.
52. As in the Chinese case, the operation of the wage goods constraint is manifest from the balance of agricultural goods trade figures in the last but one row of Table VIII. High opportunity cost foreign exchange resources had to be spent on importing agricultural goods. This contrasts with the Soviet situation in the early Plan period when it could pay for its sizeable imports of capital goods by exports of agricultural goods.

#### CONCLUSIONS

53. The preceding discussion has tried to bring out how both both India and China were confronted with the conflict between the need to relax the wage goods constraint at the same time as they were attempting to relax the capital goods constraint. By the early/Mid-sixties, they were both faced with a critical food situation that forced them to reassess the place assigned to agriculture in the overall development strategy. Both came to lay far more stress on agriculture than the Soviet Union, which could afford to give it low priority and in fact, to pursue an 'extractive' policy towards it, had to. The manner in which they laid emphasis on agriculture was, of course, different in India and China, being determined

by the ideological climate and political institutions of each country. The Chinese approach was to go in for institutional and organizational changes in the rural areas while introducing at the same time, the industrial input-intensive technology of modern agriculture. India has, on the other hand, relied almost exclusively on technological change (besides expansion of cultivated area) in its efforts at attaining food self-sufficiency. An increasing proportion of their investible surpluses have thus had to be earmarked for agriculture, though less so in the case of China because of its greater reliance on institutional change. To the extent that these resources had alternative uses in the production of manufactured consumption or investment goods, both India and China can be said to have forgone some growth opportunities. In other words, the requirements of food security and agricultural raw material self-sufficiency, taken for granted in the F-M model, imposed their own limitations on the growth possibilities open to India and China.

54. China's ability to draw upon institutional change as a source of growth in agriculture was one of the reasons why it succeeded in investing a higher proportion of its output and also in channelling a greater proportion of it into heavy industry than India, despite the more difficult task it faced of increasing further its already high yields.<sup>39</sup> The ability to keep consumption levels, both of food and light industry, depressed for long periods of time was another important factor. China's investment rate has consistently been above 25%, reaching as high as a level as 40% at times. Although India's saving rate has also now reached 23%, it has not been as high all along. More important, the figure of 23% perhaps overstates the rate of real investment, as pointed out by the Raj Committee. After allowing for unreported output, depreciation and price increases, the real rate of capital formation would be close to 12%. Moreover, a substantial part of this investment, being in the private sector and therefore determined by market considerations of profitability and turnover, was in the consumer goods, sector and not in investment goods, as in China. The Indian application of the F-M strategy has been a much diluted one compared to China. Not surprisingly there is a big difference between the industrial growth rates averaged by the two countries - 6% p.a. India and 13.6% p.a. and in China.

55 Its greater success in pursuing the F-M strategy notwithstanding, China has recently turned away from it. Under the drive to "Readjust, reform consolidate and improve" the economy launched in 1979, 'readjustment' is sought to be made in the relative proportions of the agricultural, light industrial and heavy industrial sectors. This was necessitated, according to the Chinese economists' own admission, by the neglect of the agricultural and light industrial sectors that was caused by the investment rate being too high and too high a proportion of it being channelled into heavy industry in the past. It reflects the perception of the present Chinese leadership that the austere living standards of the Chinese people over the last three decades had led to very low morale and that this, in turn, had proved to be counter-productive due to low labour productivity. Given their belief that it would not be possible/desirable to maintain the austere life styles of their people any more, it is but natural for them to seek to redress the order of priority in investment from heavy industry, light industry and agriculture to agriculture, light industry and heavy industry. In other words, this reflects their belief that it would be no longer possible to overcome the wage goods constraint by restructuring demand for consumption of these goods but only by suitably reallocating the sectoral investment proportions and thus enhancing their supply.

Such a switch in investment from heavy industry to the consumption goods sector (including agriculture) after an initial period is not contradictory to the F-M model. The which only serves to bring out the trade-off between present and future consumption and is not a prescription for all time to come. The decision to make a conscious choice in favour of present consumption and it would undoubtedly be at the cost of future consumption possibilities- is always open to the political leadership. The Chinese policy decision to switch priorities to agriculture and light industry reflects such a choice.

56. Two other major weaknesses of the F-M model, that are not the focus of this paper but which have had an important bearing on the Chinese and Indian growth experience, are its total neglect of the role played by demand considerations. The assumption of all powerful Central Planning Authority (CPA) capable of mobilising, allocating and utilising the resources at will makes for considerable simplification in analysis, but is hardly realistic for a mixed or 'Limited command' economy like that of India. The proportion of investment goods

channelled into the heavy industry sector is, in practice, not determined by the subjective desire of the CPA but limited by the capacity/inclination of the economy save. The latter is, in turn, linked to distributional considerations and several other factors and, the readiness of the CPA to accept the F-M model prescription notwithstanding, these may set limits to the investment rate. Though the savings rate of the Indian economy has now reached the fairly high level of 23%, these considerations are not irrelevant. Demand considerations limit the proportion of investment goods that can be channelled into heavy industry in another way also -by influencing the profitability of the industry that is to be the end user of the investment goods. The demand for investment goods in the consumption goods sector would be limited by the demand for the output of that sector, the manufactured consumption goods. If, for reasons for skewed income distribution or whatever, the demand base for these goods is narrow, inadequate demand from the light industrial sector for the investment goods may make it undesirable to channel a high proportion of the investment goods into heavy industry. According to one school of thought this is, in fact, the reason for the deceleration in the industrial growth rate of the Indian economy since the mid-sixties. The central emphasis in the 7th plan approach Paper to creation of large scale employment opportunities, and through it to generation of mass purchasing power, appears to be an endorsement of this view.

57. Because of the command nature of its economy, China was not deterred by the demand considerations in its pursuit of the F-M strategy. Behavioural variables such as the savings rate, could be better controlled (the savings rate was 25% plus right from the beginning) and a large proportion of the output of investment goods could be directed to heavy industry without fear of whether or not there would be adequate demand for the output of this investment in the next round. This explains its high industrial growth rate. As it happened however, it was not inadequacy of demand that finally forced a shift away from re-investment into heavy industry but a severe mismatch between the pattern of demand for investment goods and the capacity of the production structure to supply these goods. Artificially suppressed levels of consumption over a long period led to heavy pent up demand for agricultural and light industrial goods and therefore for investment goods in these sectors. The supply of investment goods consisted, **however**, because of force

of habit generated by long/pursuit of the F-M strategy, mainly of those/capable only of being reinvested in the heavy industrial sector. This explains the proclaimed intention to cut back on investment in heavy industry in favour of agriculture and light industry since 1979.

58. The third major weakness of the F-M model was its highly aggregative nature. If assumed that raw materials and intermediate goods required for production in each sector would be produced by the sectors themselves, without specifying how or allowing for the possibilities of their becoming bottlenecks in the production process. It is perhaps more than a coincidence that both India and China have ended up in a situation where they find that, having successfully eased the capital goods constraint (barring selected extremely advanced technology items both are now self-sufficient in meeting the requirements of the vast array of industrial goods required in a modern economy), non-tradeable intermediate goods-power, transportation capacity and energy (fuels) have become critical bottlenecks to growth. India devoted a fair share of investment to transportation and other infra-structural sectors so the position is not as bad as in China, where lack of transportation capacity is openly admitted to be the weakest link. Though China was exceedingly well endowed in respect of coal, oil and hydro-electric potential compared to India's chronic deficiency in oil, the energy constraint is binding on both the economies today. Power shortage is also common to both, though this has more to do with poor management than with lack of capacity. Investment in power, and more generally a full fledged "Structural adjustment" drive, is accordingly high on the priority list in both India and China in their current plans.

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42. As in India, in China<sup>38</sup> too, the cost of increasing food output has been continuously rising amount of subsidy. In the fifties, procurement and resale of grain was profitable to the State. Beginning sometime in the 60s, but definitely by 1966, the State began to incur losses in its trade of cereals and edible vegetable oils to the urban areas. By 1979 these were estimated to be 4 billion yuan p.a. rising to 6.3, 10.3 and 12.9 billion yuan respectively in 1979, 1980 and 1981. In addition losses were incurred on 'resale' of grain to cash crop growing and other grain deficit areas, sale of 'non-staple' foods and sale of imported grain. Total food subsidies in 1981 were estimated to be between 23.8

to 25.6 billion yuan; about 25% of the budgetary revenues of the Central and provincial Governments, 6% of the National Income (calculated on a Net Material Product Basis) or 30% of the wage bill of State workers and employees. (These are very high compared to India, where at 570 crores in 1978-79, food subsidies were 2% of the total Central and state budgetary outlays and 0.7% of NNP.

43. That the magnitude of the food subsidies has become uncomfortably high is also suggested by the following statement of Hu Yau Bang, Chairman of the CCP at the 12th Party Congress held in September 1982:

"We can no longer increase peasant incomes mainly through raising the prices of farm produce and "enlarging the scope of negotiated purchases".

## NOTES

This is, of course, not surprising, given the fact that the idea of economic planning itself was inspired in both the countries by the Soviet example. National planning in a practical form had been attempted only in the Soviet Union and it was the lessons of that experience which were perceived to be pertinent, rather than those derived from evolutionary industrialisation of Western societies. The formal periods of planning in India and China were as follows:

<u>India</u>	<u>China</u>
I Five Year Plan 1951-56	I Five Year Plan 1953-57
II Five Year Plan 1956-61	II Five Year Plan 1958-62
III Five Year Plan 1961-66	(Subsumed under the Great Leap Forward)
Annual Plans 1967-69	Readjustment Restoration 1963-65
IV Five Year Plans 1969-74	III Five Year Plan 1966-70
V Five Year Plan 1974-79	IV Five Year Plan 1971-75
VI Five Year Plan 1980-85	V Five Year Plan 1976-80
	VI Five Year Plan 1981-85

Feldman's model of growth, originally published in the Soviet Union in 1928, is translated in English in Soulbom (1964) and discussed in Domar (1957) and Ellman (1979). Mahalanobis independently formulated his model (Mahalanobis, 1955) which was very similar to that of Feldman.

- 3 Because of the democratic policy and mixed economy of India, there remains a sizeable private sector, whose investment decisions are outside the plan. Being governed by market considerations of profitability and turnover, these naturally tend to increase investment in the consumption goods sector, contrary to the F-M strategy dictum of holding it to minimum feasible levels. Despite its extensive powers to intervene in and influence the operations of the private sector and to align them in congruence with the planned priorities, through regulatory (licencing, capacity expansion, MRTP, etc.) taxation, subsidies, credit and monetary policies, the State cannot completely control or determine them. A whole host of factors from political ones, such as the "political will" and capacity of the State to take "hard" decisions, to legal ones, such as constitutional limits to restrictions on the rights of individuals, business entities, trade unions, etc. and judicial review of executive action, make for innumerable checks and balances. A substantial segment of the Indian plans are therefore, at most, exercises in



"exhortation planning" (Marwah, 1974 pg.158).

The totalitarian nature of the Chinese political system, in contrast, allows the process of planning to function in a more streamlined, or at least less conflictual or meandering fashion. Nation-wide objectives are more easily accorded over-riding priority and regional and local plans harmonised with them. Mao's description of "all the country a single chessboard" aptly described the Chinese planning reality. This is, however, not to attribute all round superiority to the Chinese system, to note the greater control of a "command economy" over all its activities is not to overlook the inefficiencies and weaknesses that characterise such a set up. The latter, always suspected to be endemic to the system by outside observers of the Chinese scene but never confirmed because of lack of authentic information, have now been revealed by the Chinese economists themselves to be even more troublesome than some of the most unsympathetic assessment of outsiders. 1

It is in recognition of these weaknesses of the "fully command" economy that the present leadership in China is trying to steer the economic system in the direction of a "limited command" or mixed economy. "Planned production and circulation would cover the main body of the national economy, while production and distribution of some products would be regulated spontaneously through the market". (Report presented by Hu Yao Bang, Chairman Chinese Party to the 12th Congress of the party in September '82) These moves are, however, yet very preliminary and for purposes of comparison with India, the Chinese system can be taken to be a "fully command" economy. (For a detailed comment on the differences and similarities in the context within which India and China have carried out the F-M strategy, see Marwah, 1974)

- 4 By assumption, there is no question of any agriculture-industry linkage in the F-M model. In any real world economy, however, this relationship is of fundamental importance and the literature on the subject is not surprisingly very vast. This feature of the F-M model therefore makes it extremely unrealistic
- 5 For a simple exposition, see Ali, Ifzal (1981) This framework is, of course, a highly simplified one, depicting as it does, the economy to consist of just 2 or 3 sectors- agriculture, manufactured consumer goods (light industry) and manufactured investment goods (heavy industry). In reality, no economy is organised according to just two or three sectors and the number of potential binding constraints is legion (any one of the vast number of industries with high forward linkages). Also, while the

F-M model conveniently assumes that the intermediate goods required for the manufacture of the output of each sector are manufactured within the sectors themselves, it is difficult to allocate the investment and output in sectors such as power, transportation, construction etc. into either of the two sectors of the F-M model. Operationalisation of this framework for purposes of empirical analysis is therefore a difficult task. Yet it serves the purpose of providing an analytic framework for understanding the growth process in an economy.

- 6 A rural wage goods surplus is the first condition required for any growth to take place at all because in its absence there can be no economic activity whatsoever in the urban (assumed here to be synonymous with the industrial) sector. But while it is a necessary condition it does not constitute a sufficient one and that, in fact, is what the F-M model is all about.
- 7 It is, of course, not true that increasing the usage of capital inputs is the only way of enhancing the rural surplus of wage goods. In the first place, the very concept of rural wage goods surplus is notional. Being equal to the difference of the amount of wage goods that is produced and that which is retained by the peasants for self consumption, it becomes a function not only of the output but also of the amount that the peasants decide to consume and therefore of the behaviour and retention of the peasants. The latter is, in turn, dependent on the larger macroeconomic environment and politico-economic set up: the terms of trade vis a vis non-agricultural goods purchased by the peasants; the nature of the agrarian institutional structure (private or collective ownership of land) since the 'holding power' of the peasants would depend on that, etc. Even without any change in the output level therefore, not to speak of the level of capital inputs, the rural surplus of wage goods could possibly be enhanced by a State directed or controlled collectivisation of agriculture which would facilitate mopping up of a larger proportion of the output than the peasants would surrender voluntarily under private farming. (Of course, this is not to suggest that the surplus would necessarily increase after collectivisation. It may as well be decreased, despite reduced self-consumption by the peasants, if the disincentive effects due to loss of individual ownership lead to a sufficiently large fall in output. The argument here is only illustrative of the dependence of the amount of surplus on factors other than capital inputs, via the dependence on the amount of self-consumption).

Secondly, the output itself, while it is no doubt dependent on the capital inputs, is also dependent, and perhaps more so, on factors other than capital. Conceptually, the agricultural output can be represented, like that in the case of any other productive process, via a production function to be, for any given technology, a function of the level of inputs of the factors of production - land, labour, and capital - and of the organisation that can be brought to bear upon them. The latter includes both the institutional structure within which the agricultural activity is organised and the management processes which govern it. The relative importance of capital vis-a-vis the other factors mentioned above is, however, perhaps much lesser in agriculture than in other (industrial) productive processes, where capital plays a predominant role in determining the output, both directly as well as indirectly (through its influence on the other factors eg. modern technology, which is embodied in capital, is itself, to a considerable extent, a determinant of the form of organisation and management methods). Thus the quality of land, while being relatively unimportant in the industrial manufacturing activity, is critical to agriculture. Similarly, the quality of labour inputs is far more important in most of the agricultural operations such as ploughing, sowing, transplanting, tilling etc than say in the tasks required of a worker in the modern industrial sector. Above all, there are the well known incentive/disincentive effects of the land ownership pattern (private vs. collective farming, tenancy vs. self-cultivation; farms of tenancy-short term vs. long term; fragmented vs. consolidated holdings etc.) that have an important bearing on the productivity of labour and land in agriculture. The inter-relationship of these factors with the technology used (viability of small holdings, inefficiency and wastage of land in large holdings etc.) further adds to the diminution in the role of capital as a factor influencing the agricultural output.

Despite the fact that there are these other, non-capital using, ways of increasing the rural surplus of wage goods, it is assumed for the purpose of the present argument that the only way of doing so is by application of more capital inputs into agriculture. This is not as unrealistic an assumption as it may seem at first sight. 'Soft' States like India have found many of these options to be politically infeasible and opted for the easier path of growth based on "technological change"

(embodied in capital), avoiding the harder options of carrying out the fundamental social changes that growth based on "institutional change" requires. In China, where many of such options have been utilised, the consequences of making this assumption would no doubt stand moderated to that extent. Even in that case, however, the argument is not invalidated entirely, it would still be relevant after such options have been exhausted, as will be discussed later.

- 8 This argument is developed in a more formal manner in Annexure A wherein an attempt has been made to extend the 2 sector depiction of the economy in the F-M model to a 3 sector one and to examine the growth possibilities under the conditions when the wage goods constraint is also binding.
- 9 The figures and information in this paragraph are from Tang (1980) and Eekstein, Galenson and Liu (1968) and those in the next are from Wilber (1969). The Indian per capita availability level of about 165 kg p.a is said about the limit of foodgrains that can be consumed directly. Additional consumption above this limit is invariably in the form of indirect consumption.
- 10 In India, there was a 15-20% expansion in cultivated area during the first decade or so after independence but this should be set against the fact that over 70% of her cultivated area consists of dryland - a circumstance that obtains neither in China nor in the Soviet Union.
- 11 For an analytical discussion of such effects, see Khusro (1968) and Saah and Stiglitz (1983)
- 12 According to George Blyn (1966), aggregate grain output in British India increased at an average rate of 0.11% p.a. over the period 1891-1947; the increase being only 0.03% in the latter half of the period. Rice output, constituting half the total, actually declined at the rate of 0.09%. Even with the low population growth rate of 0.67% p.a. per capita availability declined by as much as 26%, after allowing for international trade in foodgrains.
- 13 China was a net exporter of foodgrains until 1961 but became a net importer after that year in increasingly larger quantities that crossed the 10 mmt mark by the late seventies and touched 20 mmt by 1982.

- 14 The configuration of socio-political forces in the Indian State would in any case not allow any "expropriation" of such surplus as exists. The only way it can be transferred to the State/urban sector is through suitable price incentives. In China too, despite formal similarity of the State set up with that of the USSR, a policy of "expropriation" would not be expedient, given the historical tradition of the Chinese Communist Party to ally itself with the majority of the "poor and lower middle peasants".
- 15 The Indian reconstruction is based on Bhatia (1983), Dantwala (1976), Sama (1981), Kemp (1983), and the Chinese on Balassa (1982), Wang (1982), Cheng (1982), JEC (1982), Barker and Sinha (1982), Khan and Lee (1983) apart from the specific references cited at particular places.
- 16 For a substantiation of this view, see Lin (1981)
- 17 Brahmananda and Vakil (1956).
- 18 It was the second Five Year Plan that was based on the Mahalanobis model. The First Plan, lacking any theoretical underpinnings, did not aim at giving a new thrust to the economy and can hardly be said to be a "planned Plan."
- 19 Marwah (1974) dates this realisation a little earlier to the end of the 2nd Plan, when India first felt the pinch on the agricultural front: "China after the dislocations caused by Great Leap strategies, and India after the resources gap at the end of the Second Plan, awoke to the need of for heavier inputs in the agricultural sector....." (pg.197)
- 20 Dantwala (1976) Chap 1, pg.17
- 21 Statistical outline of India, 1984 (Data Services Limited) pg.160 (Table No.161) This is a rough and ready figure for the calculation of the exact magnitude of subsidies has to be made from several Government documents not all of which follow the same classification of items of expenditure.
- 22 While the respective opposing viewpoints can be found in full detail in Preobrazhensky (1965) and Bukharin (1971) and Bukharin (1928), an excellent account of the same is available in Erlich (1960). Brief summaries of the selected issues can be seen in Mitra (1977) and Dandekar (1981).

- 23 Despite the sea-change in the political climate and the liberalisation in China in recent years, it can be safely assumed that historical commentaries reviewing the past policies etc. such as this, cannot find their way into one print, least of all in foreign languages (for the consumption of the outside world), without official approval at the highest levels. The quotations reproduced here from such works may therefore be taken to be representative of the official view of the past. By the same token, it suffers gravely from the limitation that it represents the political/ideological viewpoint of the currently ruling sections of the Party (CCP) that can by no stretch of imagination be taken to be an impartial or disinterested account.
- 24 Ma Hong, (1983) pg.89
- 25 All shades of opinion among scholars and analysts of Chinese politics agree on this. See for instance Domes, J.(1972).
- 26 See eg. Chesneaux (1979)
- 27 Please see note 7
- 28 The figure is based on a recent Chinese account quoted in Brodsgaard (1983) pg. As mentioned earlier, this is the kind of information whose authenticity cannot be vouchsafed for and one must allow for a margin of exaggeration. The same is true of the information referred to in the following note.
- 29 Reported in International Herald Tribune 17th September, 1984.
- 30 As to the reason why this was so, Brodsgaard (1983) offers the explanation that lingering political differences, especially reservations on the part of Mao held back implementation. As against this view, there is the possibility that even without cleavage in the top political leadership, the logic of economic continuity and the pressures built into the system make it very difficult to bring about radical changes in these proportions in a short period of time.
- Marwah (1974) pg. 283 points out that "once a certain level of investments has been made for the creation of a modern sector, there cannot be a roll-back of funds without a regressive multiplier dis-investment effects. A steady pattern of investments has to be maintained".and

Ongoing Projects can be curtailed only at the cost of incurring huge losses.

Kornai (1981) observes that the "most important characteristic of public organisations is a persistent expansion drive and an insatiable investment hunger", since this brings greater power, prestige and patronage to the people in charge of these organisations. Although this eagerness to grow is not specific to any particular form of social, system - private enterprise or socialist, Kornai points out that in socialist economies there is nothing to restrain or moderate this drive. Unlike in the case of private enterprises, where fear of running into losses induces caution and risk aversion, there is no question of financial failure, bankruptcy etc. in socialist economies and a paternalistic State bails out all enterprises in trouble almost automatically. This, he feels is the main explanation for the insatiable investment hunger. Under such circumstances, investment is neither cost (input) nor price (output) responsive and "Government policy can moderate this essentially behavioural drive only slightly". (Please also see note 35 in this connection).

In the recent, post 1979, period too, the actual investment allocations have changed very little despite loud protestations about intentions to do so and perhaps virtually no differences among the top political leadership on the matter.

31. For a summary discussion of these measures, see Brodsgaard (1983)
32. See the then Prime Minister Hua Guo Feng's "Report to the Vth National Peoples Congress, February, 1978", Foreign Languages Press, Beijing
33. This meeting of the Central Committee of the CCP is regarded as a major turning point in post Mao Chinese politics. Though Deng Xiao Ping, the present strongman of China, had been rehabilitated to the position of Vice Chairman of the Party in July 1977, it was not until this meeting that he was able to gain clear supremacy over his opponents- Hua Guo Feng and other beneficiaries of the Cultural Revolution period- in the top elections of the Party. Both in terms of the top level personnel changes and the fundamentally different stamp of the political and economic policies, this meetings marked the beginning of the Deng era. Hence the wholesale repudiation of the 1978 10 year outline Plan.

- 34 Please see Notes 30 and 35
- 35 The reason for this, as mentioned in Note 30 is that investment allocations are not so amenable to policy control, being determined more by the legacy of the past. Moreover, the investment hunger referred to by Kornai (1981) received a boost with the systemic and enterprise management "reforms" undertaken at the same time as the move to "readjust" the economic structure as part of the policy of RRCI of 1979. Under this policy, the autonomy and decision making powers of all economic enterprises were enhanced in a bid to raise their efficiency. As a result, total investment expenditure in 1979 and 1980 far exceeded the budgeted amounts despite a reduction in the State investment, leading to unprecedented deficits. It was only by imposing drastic (45%) cuts in the state investment budget that the 1981 budget could be balanced (Balassa (1982)) still the situation of was grave enough to prompt the Chinese Government to suspend the policy of "reform" of the system of economic management in 1981. Faced with a conflict between the policies of "readjustment" and "reform", the Government unhesitatingly opted for the former, given the urgency of the task of redressing the structural imbalances in the economy. Very recently, in October 1984 the drive to "reform" the system of enterprise management was revived presumably because the investment and budget situation was found to be under control after three years of clamp down on enterprise autonomy.
- 36 World Development Report (1983), pgs, 54 citing official Chinese Government statistics.
- 37 Please see Table IV
- 38 The following two paragraphs are based on "Agricultural Prices in China" by H.R.Lardy, (World Bank Staff Working Paper No. 606) (1983).
39. It is noteworthy that China yields/land for most crops in 1950/52 were higher than those in India in 1982.
- 40 Imports of fertilisers and fertiliser rawmaterials, which are inputs for the agricultural sector and which should, strictly speaking, therefore be included in any tally of foreign trade of agricultural goods, are not included in Table IV, as the onfind some of these tables does not include them and these figures are not readily available elsewhere. It is hoped to make up for this omission later.



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Table I : Sectoral Investments in India

(Percentage of total)

	I Plan	II Plan	III Plan	Annual Plan	IV Plan	V Plan	Annual Plan	VI Plan
Agriculture & Allied Sectors	14.8	11.7	12.7	16.7	14.7	12.3	16.4	12.8
Irrigation & Flood control	29.8	18.9	7.8	7.1	8.6	9.8	10.6	12.5
Power			14.6	18.3	18.6	18.8	18.4	19.8
Village & Small Industries	4.9	24.1	2.8	1.9	1.5	1.5	2.1	1.8
Industry & Minerals			20.1	22.8	18.2	22.8	19.6	21.0
Transport & Communications	26.4	27.0	24.6	18.5	19.5	17.4	10.8	15.9
Education, Scientific, Research, Health & Family Planning	24.1	18.3	10.6	6.8	9.6	7.6	5.7	6.4
Water supply, Sanitation			2.7	2.7	4.6	5.7	6.2	9.8
Housing Urban & Refinancial Development								
Others								
Total	100	100	100	100	100	100	100	100

Sources: Economic Survey 1983-84 Tables 2.4 and 2.6, and Dhires Bhattacharya, "India's Five Year Plans", Progressive Publishers 1975.

1 Refers to investment made in the Public Sector only and excludes private investment.

Table II : Sectoral Investment<sup>1</sup> in China (Percentage of total)

	I 1953-57	II 1958-62	1963-65	III 1966-70	IV 1971-75	V 1976-80	1981	1982
Accumulation Rate <sup>2</sup>	24.2	30.8	22.7	26.7	33.0	33.3	20.5	29.0
Agriculture	7.1	11.3	17.7	10.7	9.0	10.5	6.6	6.1
Light Industry	6.4	6.4	3.9	4.4	5.0	6.7	9.8	8.4
Heavy Industry	36.1	54.0	45.9	51.1	49.6	45.9	39.0	38.5
Construction & Geological Prospecting	6.1	2.5	2.5	2.2	2.3	3.2	2.7	2.4
Transport and Communications	15.3	13.5	12.7	15.4	10.0	12.9	9.1	10.3
Commerce	3.6	2.0	2.5	2.1	2.9	3.7	6.3	6.5
Scientific Research and Education	7.6	3.8	5.7	2.0	3.1	5.4	9.0	9.2
Civil Public Utilities	2.5	2.3	2.9	1.0	1.9	4.1	7.2	7.6
Others	15.3	4.2	6.2	9.5	6.6	7.6	9.5	11.0

1 Refers to investment in new projects only and excludes investment made for modernising existing units.

2 at current prices, calculated as proportion of National Income available = National Income + Imports - Exports

Sources: State Statistical Yearbook 1983, State Statistical Bureau, PRC.

Table III : Production, Imports and Availability of Foodgrains - India

Year	Population (millions)	Net* Produc- tion of food grains million tons	Net Imports (million tonnes)	Net Availa- bility of goodgrains (million tons)	Per capita availa- bility (gms/day)
1950	397.3	60.67	1.37	62.64	430.9
1961	442.4	72.04	3.49	75.69	468.7
1962	452.2	72.10	3.63	76.08	461.7
1963	462.0	70.29	4.54	74.85	443.8
1964	472.1	70.61	6.25	70.11	452.0
1965	402.5	70.20	7.14	84.57	480.2
1966	493.2	63.30	10.31	73.48	400.2
1967	504.2	64.95	8.66	73.07	401.4
1968	515.4	83.17	5.67	86.81	460.1
1969	527.0	82.26	3.82	85.62	445.2
1970	538.9	87.06	3.55	89.49	455.0
1971	551.3	94.87	2.01	94.31	460.2
1972	563.8	92.02	7.55	96.22	466.1
1973	576.7	84.90	3.59	88.79	421.9
1974	509.2	91.50	5.15	97.14	451.2
1975	603.2	87.35	7.84	89.33	405.8
1976	616.9	102.50	6.92	112.08	452.2
1977	630.8	92.57	0.49	99.39	431.8
1978	645.0	110.61	-0.63	110.22	468.2
1979	659.4	115.41	-0.06	114.20	474.5
1980	674.1	95.99	-0.35	101.42	410.9
1981	689.0	113.39	0.45	114.02	453.6
1982	704.3	116.43	1.48	116.73	454.1

\* Net of seed requirements etc., which are taken to be 12.5% of gross production.

Source: Bhatia (1983) Table XV Pgs. 113, 114.

Table IV : Production, Imports and Availability of Foodgrains<sup>1</sup> - China

Year <sup>2</sup>	Popula- tion (millions)	Produc- tion <sup>3</sup> (million tons)	Exports (million tons)	Imports (Million tons)	Net Imports (Million tons)	Per capita Availa- bility <sup>4</sup> (Kgs/p.a)	Per capita Availability (Kgs/p.a)
1	2	3	4	5	6	7	8
1949	542	113.2	-	-	-	-	-
1950	552	132.1	1.23	0.07	-1.16		142.32
1951	563	143.7	1.97	-	-1.97		151.45
1952	575	163.9	1.53	-	-1.53		168.63
1953	588	166.9	1.83	0.01	-1.82		168.84
1954	603	169.5	1.71	0.03	-1.68		167.86
1955	615	184.9	2.23	0.18	-2.05		170.26
1956	628	192.8	2.65	0.15	-2.50		182.30
1957	647	195.1	2.10	0.17	-1.93		181.91
1958	660	200.0	2.53	0.22	-2.66		180.18
1959	672	170.0	4.16	-	-4.16		149.94
1960	662	143.5	2.72	-	-2.72		127.25
1961	659	147.5	1.36	5.21	6.45		137.40
1962	673	160.0	1.03	4.92	3.89		149.89
1963	692	170.0	1.40	5.05	4.46		184.57
1964	705	187.5	1.82	6.57	4.75		168.35
1965	725	194.5	2.42	6.41	3.99		172.07
1966	745	214.0	2.89	6.44	3.55		181.60
1967	764	217.8	2.99	4.70	1.71		177.47
1968	785	209.1	2.60	4.60	2.00		157.77
1969	807	211.0	2.74	3.79	1.55		162.74
1970	830	240.0	2.12	5.36	3.24		181.04
1971	852	250.1	2.62	3.17	1.55		180.96
1972	872	240.5	2.93	4.76	1.83		172.49
1973	892	264.9	3.89	8.13	4.24		186.91
1974	909	275.3	3.64	8.12	4.48		190.78
1975	924	284.5	2.81	3.74	0.93		192.54
1976	937	286.3	1.76	2.37	0.61		194.17
1977	950	282.7	1.66	7.34	5.68		192.25
1978	963	304.8	1.08	8.93	6.45		204.66
1979	975	332.1	1.65	12.36	10.71	195.5	221.98
1980	987	320.6	1.62	13.58	11.81		212.49
1981	1001	325.0	1.26	14.81	12.55	219.7	215.13
1982	1015	353.4	1.25	16.12	14.87	225.5	n.a

1 Includes Soyabeans & Tubers (Potatoes etc.)

2 Refers to production year (April 1 to March 31st)

3 Refers to "unprocessed grain". Also these figures are perhaps of gross output and not net of seed requirements etc., as in Table III for India.

4 Figures for availability i.e. after allowing for storage stocks are not available, except for years 1979, 1981 & 1982.

5 Estimates borrowed from Alan Piazza, "Trends in Food and Nutrient Availability in China, 1950-81", (World Bank Staff Working Paper No. 607, 1983).

Sources: Except where clarified, Statistical Year Book of China, 1983  
(State Statistical Bureau People Republic of China).

Table V : Agricultural Exports and Trade Balance, 1970-1979<sup>a/</sup> China

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
	(Million dollars, U.S.)									
Foodstuffs	645	740	955	1,530	1,995	2,125	1,945	1,960	2,275	2,630
Live animals	65	90	110	135	195	215	230	245	255	250
Meat and fish	150	185	225	335	335	415	430	375	525	635
Grains	110	95	155	445	715	720	450	395	350	335
Fruits and Vegetables	170	155	180	245	315	300	365	500	580	720
Tea and Spices	NA	NA	NA	NA	NA	160	100	280	230	315
Other Agricultural Products	335	420	515	645	590	730	725	775	900	1,290
Oilseeds	65	65	70	110	135	140	85	85	95	200
Textile fibers	100	120	205	330	190	250	285	290	400	510
Crude animal materials	115	105	115	170	200	230	260	335	375	445
Vegetable Oils	NA	NA	NA	NA	40	40	40	30	55	65
Total, agricultural	980	1,160	1,470	2,175	2,585	2,855	2,670	2,735	3,255	3,920
Total, all exports	2,155	2,535	3,220	5,100	6,730	7,130	7,260	8,110	10,120	13,750
Agricultural trade balance <sup>b/</sup>	380	625	645	425	240	1,500	1,720	625	605	175
Overall trade balance <sup>b/</sup>	(55)	220	420	75	(645)	(265)	1,240	985	(1,065)	(1,810)

Sources: Central Intelligence Agency, China's International Trade Quarterly Review, Second Quarter, 1980, ER CIT 81-001, Feb. 1981, and earlier CIA trade review. R.E. Batsavage and J.L. Davie, "China's International Trade and Finance," in Chinese Economy Post-Mao, Congress of the United States, Joint Economic Committee, 1976. Vol. I: pp. 707-741. Some minor adjustments have been made to the data presented in these sources.

( ) = negative value

NA = not available.

<sup>a/</sup> Export values f.o.b. basis. All figures rounded to the nearest \$5 million.

<sup>b/</sup> Exports minus imports.



Table VI : Agricultural Imports, 1970-1979<sup>a/</sup>; China

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
	(Million dollars, U.S.)									
Foodstuffs	395	320	500	1,015	1,440	885	560	1,105	1,460	1,945
Grain	280	215	345	840	1,180	675	325	720	1,000	1,575
Sugar	80	70	135	125	175	180	250	330	290	220
Other agricultural products	215	215	325	735	905	470	390	1,005	1,190	1,805
Oilseeds	-	-	10	65	160	15	5	125	40	125
Rubber	10	60	70	170	155	145	150	215	95	325
Textile fibers	95	125	215	450	520	260	190	460	760	1,095
Crude animal & vegetable Materials	NA	NA	NA	NA	25	20	20	40	40	50
Animal & Vegetable fats & Oils	NA	NA	NA	NA	45	30	25	165	155	210
Total, agricultural imports	600	535	825	1,750	2,345	1,355	950	2,110	2,650	3,750
Total, all imports	2,210	2,315	2,800	5,025	7,375	7,395	6,025	7,120	11,185	15,560

Sources: Same as Table W. Import data for 1977 and 1978 have been adjusted to the same C.I.F. basis as that for earlier years.

— = none or negligible.

NA = not available.

a/ Import values: C.I.F. basis. All figures are rounded to the nearest \$5 million.

Table VII : Exports of Agricultural Products - India

(U. S. \$ Millions)

	1950-51	55-56	60-61	65-66	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82
Agricultural Goods	329	381	421	497	519	536	502	255	1250	1393	1363	1640	1461	1622	1645	1474
Raw cotton and Tobacco	40	24	49	61	61	79	107	130	120	156	130	133	195	239	307	305
Total	369	465	470	558	500	615	609	909	1378	1549	1501	1773	1616	1861	2032	1779
Total Exports of Goods	1261	1279	1387	692	2047	2160	2550	3239	4174	4672	5753	6315	6978	7948	8502	8739

Table VIII: Imports of Agricultural Goods - India

(U.S. \$ Millions)

	50-51	52-56	60-61	65-66	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Foodgrains	-	-	378	670	272	143	91	297	951	1537	959	121	114	131	127	789	318
Fertilisers	26	5	22	82	101	120	159	243	618	610	214	321	452	460	827	571	151
Fertiliser Raw Materials	-	-	11	27	32	32	31	52	134	102	161	140	145	179	210	212	130
Edible Oils	-	-	7	15	31	38	20	73	15	16	112	829	649	552	865	700	235
Fibres - Cotton	212	120	172	97	132	152	118	67	34	33	145	232	35	-	-	10	-
Fibres - Synthetic	-	-	-	4	10	6	6	3	3	7	34	224	148	135	122	194	130
Total	238	125	591	895	578	491	425	1085	1755	2305	1565	1847	1543	1457	2151	2076	964
Total Imports of Goods	1365	1426	2393	2958	2179	2451	2423	3793	5666	6084	5676	7031	8270	11321	15913	15240	14909
Balance of Agricultural Trade	+131	+340	-121	-377	+2	-124	+264	-46	-377	-750	-64	-74	+73	+404	-119	-297	+817
Balance of Agri- cultural Trade excluding ferti- lisers	+157	+345	-88	-226	+135	+276	+454	+249	+375	-48	+251	+367	+670	+1043	+918	+486	+1000
Balance of Trade (overall)	-104	-147	-1056	-1266	-229	-291	+135	-554	-1491	-1777	-175	-873	-1541	-3435	-7700	-6981	-6248

A simple 3 sector model of the economy

The following is an attempt to incorporate the wage goods constraint into the structure of the Feldman-Mahalanobis (F-M) model. The consumption goods sector of the F-M model is explicitly defined to be a manufactured consumption goods (light industry) sector, while a third sector accounts for agricultural goods. This allows examination of the influence of the wage goods constraint on the growth possibilities open to an economy. Thus the economy consists of three sectors:

Sector 0 : the agricultural sector producing wage goods (food) in the rural areas

Sector 1 : the light industrial sector, in the urban area, producing manufactured consumer goods

Sector 2 : the heavy industrial sector, also in the urban area, producing investment goods for all the three sectors

Raw materials required by each sector are assumed to be provided by the sectors themselves, as in the F-M model.

At any given time  $t$ , the economy is endowed with a capital stock  $K_i^t$  in sector  $i$  ( $i = 0, 1, 2$ ), land  $A^t$  and a population  $N_R^t$  in the rural sector and  $N_U^t$  in the urban sector. The population is growing at an exogenously given rate  $g$ .

Employment  $L_0^t$  in the rural sector is total i.e.  $L_0^t = N_R^t$  and is not governed by the size of the capital stock existing, as in the two urban sectors. In the latter, the employment potential  $L_1^t$ , is dependent on  $K_1^t$ , and under the fixed coefficients assumption made below,  $L_1^t = K_1^t \cdot \alpha_i$  ( $\alpha_i$  is defined on Page 2). The actual employment  $N_{U1}^t = L_1^t$  if the urban population is larger than the employment potential in the two urban sectors; otherwise it is equal to the urban population as allocated between the two sectors. An all powerful Central Planning Authority (CPA) is assumed to be able to mobilise, appropriate and allocate all resources - inputs and outputs at will, so that it is possible, as in

the F-M model, to abstract from demand considerations completely. Distributional questions are also ignored; it being assumed that the CPA can ensure egalitarianism or any other desired distribution with the same aggregate requirements as an egalitarian one.

The assumptions of the F-M model of a closed economy, malleable and non-shiftable capital (once employed) and sector 2 being the only source of investment are made here also.

The output of sector  $i$ ,  $Y_i$  may be written as

$$\bar{Y}_0^t = \bar{Y}_0 (A^t, K_0^t, L_0^t, W, T) \text{ where } W \text{ is a weather index variable and a technological change variable.}$$

$$\bar{Y}_1^t = \bar{Y}_1 (K_1^t, L_1^t)$$

$$\bar{Y}_2^t = \bar{Y}_2 (K_2^t, L_2^t)$$

Assuming fixed coefficients of production for the two manufacturing sectors, their output may be written as

$$\bar{Y}_1^t = \text{Min} (\beta_1 K_1^t, \frac{\beta_1}{\alpha_1} L_1^t)$$

$$\bar{Y}_2^t = \text{Min} (\beta_2 K_2^t, \frac{\beta_2}{\alpha_2} L_2^t)$$

where

$$\beta_i \text{ output - capital ratio for sector } i \quad \left. \begin{array}{l} \beta_i \\ \alpha_i \end{array} \right\} i = 1, 2.$$

$$\alpha_i \text{ labour - capital ratio for sector } i \quad \left. \begin{array}{l} \beta_i \\ \alpha_i \end{array} \right\}$$

No such expression can be written for the output of the agricultural sector,  $\bar{Y}_0^t$ , since the production function approach too simplistic to capture reality in that sector.

The output of the investment goods sector  $\bar{Y}_2$  is allocated between the three sectors 0, 1 and 2:

$$\bar{Y}_2^t = \bar{Y}_2 \cdot (L_0^t, L_1^t, L_2^t) \text{ where } (L_0^t + L_1^t + L_2^t) = 1.$$

The assumption of fixed coefficients of production allows determination of the time path of the output in sectors 1 & 2 as in the F-M model if labor is not a binding constraint, as in the case in labor simpler economies

$$\bar{Y}_2^t = \bar{Y}_2^0 (1 + \beta_2 \lambda_2)^t$$

$$\bar{Y}_1^t = \bar{Y}_1^0 + \frac{\lambda_1 \beta_1}{\lambda_2 \beta_2} \bar{Y}_2^0 \cdot \left[ (1 + \lambda_1 \beta_1)^t - 1 \right]$$

The capital stock and hence the employment potential in each of these sectors will accordingly be

$$L_2^t = \frac{\lambda_2}{\lambda_2} \bar{Y}_2^0 \cdot (1 + \lambda_2 \beta_2)^t$$

$$L_1^t = \lambda_1 K_1^0 + \frac{\lambda_1 \lambda_1}{\lambda_2} K_2^0 \cdot \left[ (1 + \lambda_1 \beta_1)^t - 1 \right]$$

The output and employment in the wage goods sector can not be determined in this manner in the absence of any such restrictions/specification of the functional form of the production function.

The suffix 't' is dropped henceforth for simplicity.

The  $\lambda_i$  are the policy variables; their impact is felt from the next period onwards. In addition, the CPA has the option to transfer labour from the rural sector to the urban sector or vice versa and within the urban sector; from sectors 1 to 2 and vice versa. Such transfer takes effect within the same period (i.e.  $N_r$  and  $N_{u1}$ ,  $N_{u2}$  are immediately adjustable variables subject to  $(N_{u1} + N_{u2}) = N_u$  and  $(N_r + N_u) = N$ )

Let  $x_0$  be the minimum level of the wage good (food) necessary for subsistence of each individual. Then  $X_0 = x_0 \cdot N_r$  is the subsistence requirement of wage goods in the rural sector and  $(Y_0 - X_0)$  is the maximum surplus<sup>1</sup> of wage goods obtainable from the rural sector.  $\frac{(Y_0 - X_0)}{x_0} = L$

(say) is then the maximum number of urbanites that can be supported by the domestic output of the wage goods sector. This number may or may not be larger than the size of the urban population. Hence the idea of a wage goods constraint.

Let  $x_1$  similarly be the minimum level<sup>2</sup> of the manufactured consumer good required for subsistence. Then  $(Y_1 - x_1 \cdot N)$  is the maximum surplus of consumer goods that can either be exported or redistributed among the population for above subsistence level consumption. It is assumed that  $(Y_1 - x_1 \cdot N)$  is  $> L$ , though only nominally so, so that sector 1 can neither play any constraining role in the growth process nor can it play any significant role in relaxing the other constraints through large exports of consumer goods. It thus appears in the model essentially as a residual sector, influenced by, but one that does not itself influence, the interplay of the wage and the capital goods constraints.

Impact of the Wage goods and Capital Goods constraints

The impact of the wage goods constraint is felt through the parameter  $L$ , since no more than that number of urbanites can be supported by the domestic output of food.

The impact of the capital goods constraint is felt through the parameters  $L_1 + L_2$  since no more than  $(L_1 + L_2)$  number of people can be employed productively in the manufacturing sectors, even if enough wage goods were available to feed more in the urban sector.

If  $N_u > L$ , the wage goods constraint is binding.

If  $N_u > (L_1 + L_2)$ , the capital goods constraint is binding.

And, since capital and labour are complementary inputs, if  $N_u < (L_1 + L_2)$ , the labour constraint is binding, i.e. the labour force is not large enough to allow the existing capital stock to be utilised fully. Normally this possibility is not considered at all in labour surplus economies.

The relative magnitudes of  $L$  and  $(L_1 + L_2)$  are also important, however, as detailed below. The following six cases are possible:

- i)  $L > N_u > (L_1 + L_2)$  — only capital goods constraint binding
- ii)  $N_u > (L_1 + L_2) > L$  — wage and capital goods constraint binding
- iii)  $N_u > L > (L_1 + L_2)$  — wage and capital goods constraint binding

...5...

- iv)  $L > (L_1+L_2) > N_U$  — only labour constraint binding
- v)  $(L_1+L_2) > L > N_U$  — only labour constraint binding
- vi)  $(L_1+L_2) > N_U > L$  — wage goods and labour constraint binding

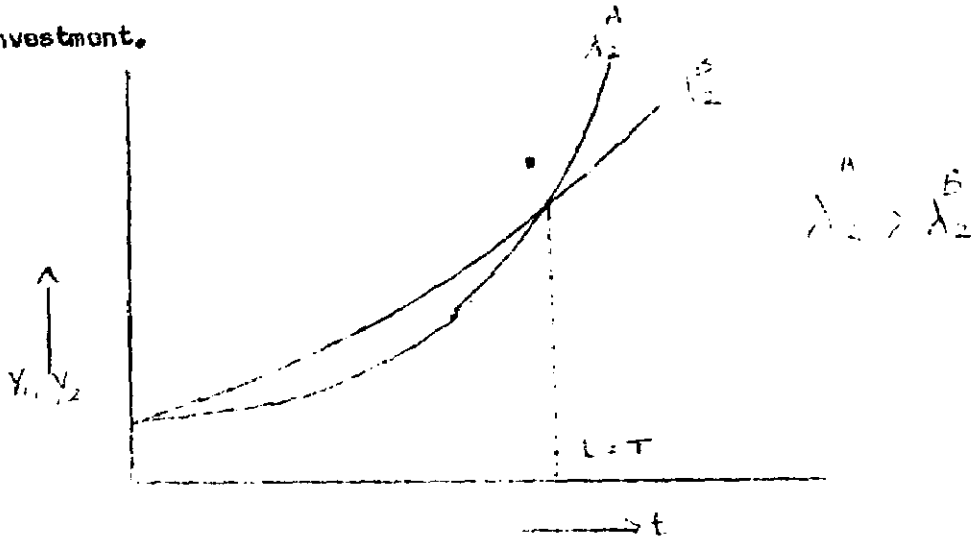
Case i :  $L > N_U > (L_1+L_2)$

The wage goods constraint is not binding - the rural sector has enough surplus to feed the entire urban population and more but the capital stock existing in the modern industrial sectors is insufficient to employ all the urban population. The capital goods constraint alone is thus binding.

This is the F-M model case : lack of sufficient investment goods prevents the economy from transforming the surplus of wage goods over current consumption needs into manufactured consumer or capital goods. The extension of the 2 sector F-M model to a 3 sector one (including also the agricultural sector) makes no difference in this case since what is implicitly assumed in the F-M model happens to be the prevailing situation here. With a surplus of wage goods more than sufficient to meet the urban needs already forthcoming from the rural sector with whatever capital stock that exists in that sector, there is no need for the CPA to allocate a part of  $Y_2$  to that sector to enhance the output of sector 0, unless it is considered preferable to immediately raise the consumption of the wage good at the cost of growth. In other words, the opportunity cost of not channelling any part of the output of the investment goods sector into sector 0 is zero, so that  $L_0$  can be set equal to zero. And with  $L_0$  set equal to zero, the policy parameters left are the same as the ones in the F-M model -  $\lambda_1$  &  $\lambda_2$ . The F-M model trade-off between the short run and long run rates of growth via the relative magnitudes assigned to  $\lambda_1$ ,  $\lambda_2$  then applies here as well. A strategy of industrialization based on priority for investment goods (high  $\lambda_2$ ) would entail a slower rate of growth of both consumption and employment in the short run but ensure higher levels of both in the long run, as shown in the graph below,



than under a strategy of priority for the consumption goods section in investment.



The surplus of wage goods over and above the amount consumed can be used, if trade opportunities are open to the CPA, to import investment goods and thereby further enhance the growth possibilities or to import manufacture consumption goods if that is considered desirable. In such an open economy model, the CPA would be faced with the additional choice of using part of  $Y_2$  to enhance the output of  $Y_0$  and trade the surplus  $Y_0$  for investment goods on the external market. This choice would depend on the import and export prices of the wage and capital goods and the productivity of sectors 0 & 2. Thus it will be advantageous for the CPA to import, rather than manufacture, investment goods if

$$\left( \frac{\Delta Y_0}{\Delta K_0} \right) \cdot \frac{P_0}{P_2} > \beta_2 \quad \text{where } P_0, P_2 \text{ are the foreign trade prices of sector 0 and 2 goods respectively.}$$

However, this is in pure economic terms and does not take into account the loss in utility suffered by the CPA on account of the fact that it would in this case be dependent on imports for its growth prospects, whereas manufacturing investment goods, even if costly, offers the advantage of being able to ward off strategic pressures on the economy.

...7...

Over time,  $N$  would increase (exogenously) and there would also be a rise in  $x_0$  due to changing notions of what constitutes a subsistence level of existence. These would lead to a rise in the aggregate demand of wage goods. On the supply side, the increase in output in sector 0 with increasing amounts of labour applied to the fixed stock of land and capital (assuming once again the closed economy model and the parameter  $t_0$  set equal to zero.) is likely to encounter diminishing returns. Depending upon the marginal productivity of labour in sector 0, this could lead to a fall in  $L$ . Taken together, these tendencies on the demand and supply side would eventually wipe out the surplus of wage goods. At this point the economy is making the transition to case (ii) discussed below:

Case ii  $N_U > (L_1 + L_2) > L$

Both the wage and capital goods constraints are binding; the wage goods constraint more severely so, in the sense that the rural surplus of wage goods can not even support the number of urbanites that the existing capital stock can employ, leave alone the entire urban population which is greater than the employment potential in the modern industrial sector.

It is evident that in such a case the economy would require food aid to the extent of  $(N_U - L) \cdot x_0$  for such length of time as  $N_U > L$ , since there is no way the population can survive otherwise. Presuming that the overriding objective of the CPA would then be to end this dependence on food aid, the following two options are open to the CPA within the framework of the model:

i) Transfer the unemployed urban labour force  $(N_U - L_1 - L_2)$  to the rural areas (assuming this is feasible) and engage them either in agriculture i.e. increase the labour intensity of cultivation, or in indirectly productive activities such as building of productive assets that will add to the productivity of labour subsequently. The former will add a stream of output  $(MPL)_0$  from the same period onwards and the latter a stream of additional output equal to  $(MPL)_0^{t+k}$  from  $k$  periods hence (where  $MPL'_0 > MPL_0$ ) assuming that the asset building activity takes  $k$  periods. Thus this

choice would be made in favour of utilising the transferred labour for direct cultivation if

$$(MPL)_0^t > \frac{(MPL)_0^{t+k}}{(1+r)^k} \quad \text{where } r \text{ is the discount rate for future consumption vs. present that takes into account the preference for self-reliance in food.}$$

ii) Raise the productivity of labour in sector 0 by channelling as much of the investment goods output to sector 0 as as possible. There is clearly a trade-off involved here since increasing  $L_0$  at the cost of  $L_2$  ( $L_1$  is assumed to be set at some minimum value sufficient to ensure the desired minimum consumption of consumer goods as mentioned earlier) would mean compromising the growth in the capacity of the investment goods sector, which is also a binding constraint, and therefore the long term rate of growth of the economy. Thus if  $L_0$  is changed by  $\Delta L_0$  ( $\Delta L_2 = -\Delta L_0$ ), the alternative streams of additional outputs would be

$$\left( \frac{\Delta Y_0}{\Delta K_0} \right)^t \cdot \Delta L_0 = Y_2 = X \text{ (say) from the next period onwards and}$$

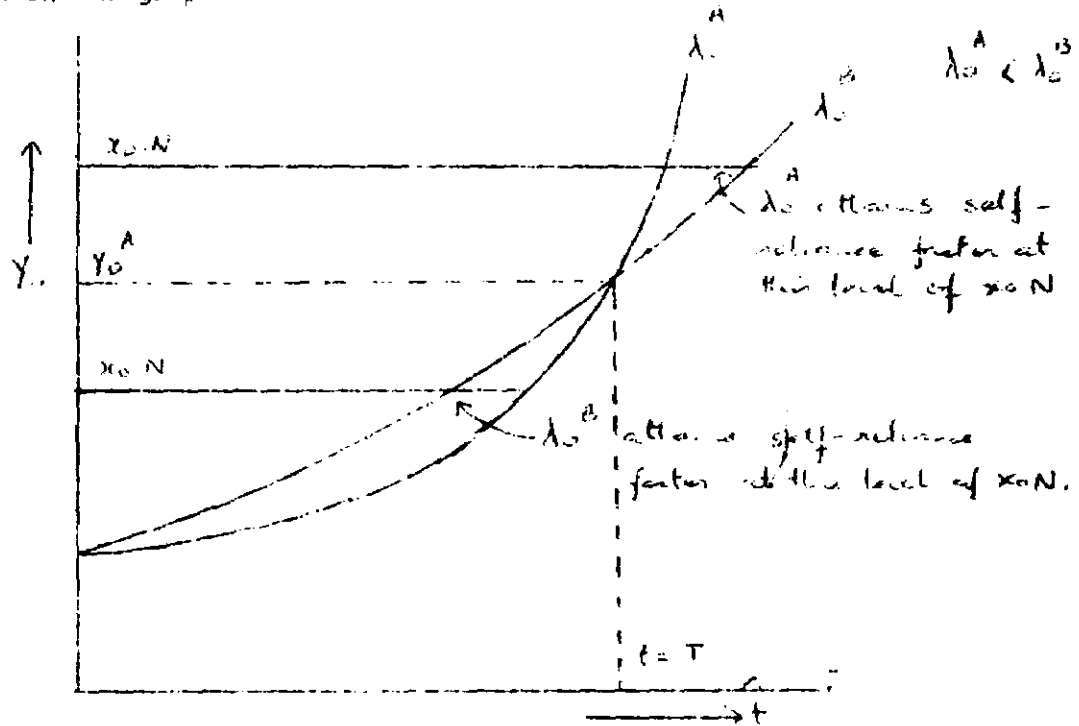
$$\left( \frac{\Delta Y_0}{\Delta K_0} \right)^{t+1} \cdot \left( \frac{\Delta Y_2}{\Delta K_2} \right)^t \cdot \Delta L_2 = Y_2 = Y \text{ (say) from the period after next}$$

Thus the choice would be for increasing  $L_0$  if

$$X > \frac{Y}{1+r} \quad \text{i.e. if } (MPK)_0^t > (MPK)_0^{t+1} \cdot (MPK)_2^t \cdot \frac{1}{(1+r)}$$

This trade-off is somewhat analogous to the present vs. future consumption trade-off in the F-M model, except that the form of the production function in sector 0 not being known, we cannot write down the time paths of growth of output in the two cases. Qualitatively, however, it can be argued that the same trade-off between the short and long run growth operates. Channeling investment goods into sector 0 instead of reinvesting them would lead to greater increase of  $Y_0$  in the short run

than if they were reinvested, but in the long run, the additional amount of investment goods generated by investing would add more to  $Y_0$  than in the former case. This means that the time paths of the output of sector 0 in the two cases would be similar to that of  $Y_1$  in the F-M case, as shown below on the graphs.



The CPA would have to decide whether to accept more (i.e. quantitatively larger) dependence on food aid in the short run in return for the a rapid reduction in the dependence in the long run or to seek lesser dependence in the short run at the cost of a slower reduction of dependence in the long term future. This choice would depend on the level of sector 0 output that defines self-reliance in relation to the point A in the graphs where the slow and fast long run growth paths meet, as shown on the graph. If  $x_0.N$ , the output of wage goods required for self-reliance is higher than  $Y_0^A$ , clearly the faster long run growth path would lead to earlier termination of food aid. If, on the other hand, the level  $x_0.N$  is lesser than  $Y_0^A$ , the slower long run growth path would be preferable. That is, the choice between channelling more

investment goods to the agricultural sector or to the investment goods sector would depend on the extent of the shortfall of the economy's food output in relation to its needs. For a marginal shortfall, it would perhaps be preferable to divert investment goods to the agricultural sector immediately and attain quick self-reliance in food, even though this would compromise the long term rate of growth. For economies with a large shortfall in the food output, the quickest way to terminate food aid dependence would seem to be to accept more food aid in the short term and channel all available investment goods output meanwhile for re-investment into the investment goods sector.

Either way, it is clear that the fact of the wage goods constraint being binding is a major handicap for the long run growth prospects of the economy. The problem of ensuring food security assumes priority in such a case over the growth prospects of the economy. A considerable part of the investment goods capacity in the industrial sector gets tied up in the agricultural sector or in agriculture related sectors, leaving lesser resources for growth. This was perhaps the Ishikaria<sup>3</sup> argument that in the developing countries of Asia, significant resource flows into agriculture were likely to be necessary for financing investments needed to introduce technical change in agriculture and thence to enhance agricultural productivity and output.

In such a situation, the possibility of pursuing the imbalanced growth strategy of the F-M model is precluded; per force of circumstances, the CPA would need to follow a more balanced growth strategy. What precisely constitutes a 'balanced' growth strategy is a matter of definition. Several criteria could be followed.

- a) The  $K_i$ 's should be chosen so as to keep the sectoral output shares constant.
- b) The  $K_i$ 's should be chosen so as to maintain the ratios of the capital stock in the three sectors the same as at time  $t=0$  (either of these would, of course mean no structural change).

ii) The  $\lambda$ 's should be so chosen that the wage goods constraint is just prevented from becoming binding. This would, of course, still be an imbalanced growth strategy, only somewhat moderate compared to the extremely imbalanced one prescribed by the F-M model.

Case iii):  $N_u > L > (L_1 + L_2)$

Both the wage goods and capital goods constraints are binding; the capital goods constraint more severely so in the sense that the existing capital stock is insufficient even to employ the number that can be supported by the rural surplus of wage goods, which itself is inadequate to feed the entire urban population.

The case is similar to case ii) and the same analysis applies. The economy would need food aid to the extent of  $(N_u - L) \cdot x_0$  for such length of time as  $N_u > L$ . The options before the economy are the same as in case ii).

A less extreme case of the constricting effects of the wage goods constraint would be when the rural surplus is almost equal to or only nominally greater than the urban requirements i.e.  $L \approx N_u$ , or when  $L = N_u$  but the rate of growth of  $L$  is less than the exogenous rate of growth of the population so that, though sufficient for the moment, the rural surplus is likely to fall short in the near future. This was, and is, perhaps the situation in the case of both India and China. From the discussion of the 'pure inequality' cases above, it is evident that it would be necessary in this case to apportion a part of the investment goods output to the agricultural sector in order to raise the food output in anticipation of the impending shortage. The effect on the long term growth prospects of the economy are the same - a limitation that is not encountered in the situation when there is considerable slack in the wage goods constraint, as perhaps was the case in the USSR when it embarked on its planning exercise.

Case iv):  $L > L_1 + L_2 > N_u$

This is the happy circumstance when the wage goods surplus is enough to feed the entire urban population and the size of the existing capital stock is also more than adequate to employ all of it. The excess wage goods can be used to raise the level of consumption of wage goods or import capital goods of a labour saving nature. (Since more addition to the existing surplus capital stock would be pointless). The urban sector suffers from labour scarcity in this case, so that the policy prescription in this case would be release labour from the agricultural sector by replacing it with capital. So long as  $L_1 + L_2 > N_u$ , and  $L > L_1 + L_2$ , even a reduction in  $L$  as a result of withdrawal of labour from the rural sector would make sense, though this would be atleast partly counter balanced, by the addition of capital to the agricultural sector. The opportunity cost of this capital is now since there is no labour to work the machines is already in existence.

Case v):  $L_1 + L_2 > L > N_u$

Though neither the wage goods nor the capital goods constraints are binding as in case iv) the wage goods constraint is potentially binding in the sense that the wage goods surplus can support less urbanites than the manufacturing sector can employ. Hence  $\lambda_0$  must be kept high. There is surplus employment capacity in the manufacturing sector but insufficient labour, and potentially an insufficient supply of wage goods, to utilise capital. The CPA would therefore, need to channel  $Y_2$  into agriculture and withdraw labour force from it (so long as the negative impact of withdrawal of the labour force is compensated for by the additional capital) to utilise the capital stock existing in the manufacturing sector. Labour saving technical change would be required as in case iv).

Both cases iv) and v) could perhaps be representative of most of the developed nations, where labour, and not capital, is scarce and the economy enjoys food surpluses.

Caso vi) :  $L_1 + L_2 > N_U > L$

The wage goods constraint, but not the capital goods constraint is binding. Though labour is also potentially a bottleneck, the real binding constraint is wage goods, so that  $L_0$  should be high in order to raise the wage goods surplus. Until such time as  $L = N_U$ , it would not pay to withdraw labour from agriculture. Since even the existing urban population cannot be fed. When  $L = N_U$ , transfer labour from agriculture to the urban sector would be worthwhile provided  $(MPK)_0 > (MPL)_0$ . (In the interregnum,  $(N_U - L)$  of the urban population would have to be fed in imports. Since  $Y_2$  is needed for enhancement of  $K_0$  and  $K_2$  itself, the only exports possible would be of  $Y_1$ . This would imply a depression in the level of consumption of manufactured goods).

Hence capital has to be channelled into sector 0 so as to change the factor proportions there and release labour for sectors 1 & 2.



## NOTES

- 1 It must be noted that in the real world, the rural surplus of wage goods is a national concept and it is difficult to give it operational content. This is because of the behavioural responses of the farmers that enter in two critical ways -
- a) in the decision on input levels of the various factors of production, namely land, labour, irrigation etc., which will determine the output and
  - b) the decision on how much of the output they wish to retain for self-consumption. That is both in the generation and mobilisation of surplus, the CPA would have to reckon with the behavioural responses of the farmers. These can be incorporated by introducing utility functions for farmers and urban wage earners and subjecting them to a constrained optimisation exercise. Or the CPA itself may resist the temptation to actually extract all the surplus in recognition of the fact that food is productive input that affects labour productivity and allow a higher than  $x_0$ , more realistic, level of consumption. Nor need  $x_0$  be postulated to be an unchanging minimum. The above calculation, based on stringent consumption levels no higher than subsistence level, is made only for simplicity and is not crucial for the subsequent discussion. The essential idea required is only that, depending upon the magnitude of this surplus (however arrived at), only a fixed number of urbanites and no more can be supported.